

以質子磁共振光譜與氟-18-氟膽鹼正子造影於乳癌診斷：初步報告

Use of Proton MR Spectroscopy and 18F-Fluorocholine PET for Breast Cancer Diagnosis: Preliminary Study

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PT002-BR

藉由超音波導引的粗針穿刺來診斷非典型的乳管增生

Atypical Ductal Hyperplasia of the Breast Diagnosed by Ultrasonographically Guided Core Needle Biopsy

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PURPOSE: We analysed the ultrasonographic (US) features of atypical ductal hyperplasia (ADH) of the breast diagnosed by US-guided core needle biopsy (CNB) with the aim of identifying factors that affect the underestimation of ADH.**MATERIALS AND METHODS:** A total of 134 ADH lesions sampled by US-guided CNB were reviewed retrospectively. All lesions were evaluated for pattern, size, lesion characteristics and margins, and the corresponding surgical outcome or imaging follow-up was obtained. Each patient's clinical and radiological features were analysed to identify factors involved in ADH underestimation.**RESULTS:** The prevalence of malignancy in each pattern of lesions following surgical excision was 32/81 (40%) for solid masses, 14/31 (45%) for ductal patterns, 5/17 (29%) for complex cystic lesions and 2/5 (40%) for architectural distortions. Based on the results of surgical and US follow-up, none of the category 3 lesions was proven to be a malignancy. Malignancy was found in 17 (21%) of the 80 BI-RADS (Breast Imaging Reporting and Data System) category 4a lesions, 20 (74%) of the 27 category 4b lesions, 12 (92%) of the 13 category 4c lesions, and four (100%) of the four category 5 lesions. Lesions with a higher US assessment category, lacking circumscribed margins, or a mammographic finding of suspected malignancy were all significantly associated with underestimation (p < 0.05 for each).**CONCLUSION:** US is useful in evaluating ADH lesions and in clarifying the indication for biopsy of these lesions. Familiarity with the frequency associated with malignancy for each feature will improve the utility of US in the work-up of these breast lesions.

利用自動化電腦分析台灣婦女的體積乳腺密度分佈 Volumetric Breast Density Evaluation of Taiwanese Women

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PURPOSE: The purpose of this study was to analyze the volumetric breast density (VBD) distributions from digital mammography images of Taiwanese women.

MATERIALS AND METHODS: 6,476 mammographic images from 1,619 cases (including two mediolateral oblique views and two craniocaudal views each woman) performed using Hologic Selenia at our institution in the period from Jun 2013 to Oct 2013 were analyzed retrospectively using an automated volumetric breast density methodology. VBD variations between age and between breast thickness from two age groups (30-49 years and 50-69 years) were also demonstrated.

RESULTS: The average age of the women included in this study was 54 ± 7.71 years and average breast thickness was 4.8 ± 1.1 cm, about 62% of the women had VBD between 5% and 15%. The average VBD was $14.62\% \pm 7.22\%$ for Taiwanese women in our study and was slightly higher than the mean VBD data from Chinese women of Malaysia (13%). Additionally, VBD tends inversely proportional to age with mean VBD of 21.53%, 18.03%, 13.69%, 10.58% and 9.77% for the age group of 31-40 year, 41-50 year, 51-60 year, 61-70 year, 71-80 year, respectively. VBD also has a decreasing trend with breast thickness increased and tends fitting well with three-order polynomial functions in the both age groups.

CONCLUSION: This study demonstrated the feasibility for evaluating breast density using automatic volumetric assessments in mammography. The preliminary result of VBD distributions in our research may be served as a reference for the breast screening program implemented in Taiwan.

PT004-BR

在乳房攝影中呈現緻密性乳房的影響因素之探討 Factors Associated with Dense Breast In Mammography

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PURPOSE: In the breast examination, the mammography is widely used in Taiwan. The dense mammography does influence the recall rate and false negative of the examination. We will find out the influence factors of dense breast, including weight, height, BMI and family history.

MATERIALS AND METHODS: We study and analyze 3225 cases, including their age, height, weight, BMI (body mass index), family history, dense or non-dense mammography, mammography report, breast ultrasound report, cancer or not cancer, and cancer stage since 2012/1/1 to 2013/7/31 in Nantou city. The breast is dense or not dense according to the doctor diagnosis.

RESULTS: The results of our findings are: (1) young age with high percentage of dense breast, (2) less weight, taller height with high percentage of dense breast, (3) low BMI with high percentage of dense breast, (4) early menarche with high percentage of dense breast, (5) menopause no significant influence on dense breast, (6) mother family cancer history and dense breast with high percentage of breast cancer, (7) BMI no significant influence on breast cancer or non-breast cancer.

CONCLUSION: The young age, low weight, tall height, low BMI, family history and early menarche have high percentage of dense breast.

磁共振造影偵測局部侵入性乳癌接受輔助性化學治療的反應

MRI in the Detection of Response to Neoadjuvant Chemotherapy for Locally Advanced Breast Cancer

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PURPOSE: Our purpose is to analyse the roles of MRI in the detection of response to neoadjuvant chemotherapy (NAC) by comparing breast MRI before and after NAC in patients with Locally Advanced Breast Cancer (LABC).

MATERIAL AND METHODS: This is a retrospective study to collect patients who underwent breast MRI both before and after NAC from January 2012 to November 2013 at a regional teaching hospital of central Taiwan. We evaluate their MRI appearances before and after NAC.

RESULTS: There are 4 cases of local advanced breast invasive ductal carcinoma, diagnosed by core biopsy before chemotherapy, received breast MRI prior to and after NAC. Three of them are stage 3 and one is stage 2 before NAC. All four cases show reduction of the tumor volume in the following MRI after NAC. MRI helps to detect the residual tumor size in our four cases and assess breast-conserving surgery.

CONCLUSION: Breast MRI provides the clinician with more knowledge about the tumor response to NAC and helps to assess the possibility of breast-conserving surgery.

PT006-BR

以型態與藥物動力學模型為基礎之乳房動態對比增強磁共振造影之電腦輔助診斷系統

Computer-aided Diagnosis for Breast DCE-MRI Based on Morphologic and Pharmacokinetic Model

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PURPOSE: To develop a computer-aided algorithm for tumor characterization by combining kinetic and morphological features of 3-D breast dynamic contrast enhanced (DCE)-MRI.

MATERIALS AND METHODS: One hundred and thirty-two biopsy-proven lesions (63 benign and 69 malignant lesions, range 0.7- 8.5 cm) in 99 women (range 32-85 years) from August 2006 to September 2009 were used to evaluate the performance of the proposed computer-aided algorithm. An integrated color map created by intersecting kinetic and area under the curve (AUC) color maps was applied to detect possible lesions, followed by segmenting the tumor. Modified fuzzy c-means (FCM) clustering was used to identify the most representative kinetic curve of the whole segmented tumor, then characterized using conventional curve analysis (higher maximum enhancement, shorter time to peak, higher uptake rate and faster washout rate) or pharmacokinetic model (the volume transfer constant between plasma and EES, rate constant between plasma and EES, volume fraction of plasma and the volume of EES). The 3-D morphological features including shape features (compactness, margin, and ellipsoid fitting) and texture features (based on the grey level co-occurrence matrix) of the segmented tumor were obtained to characterize the lesion.

RESULTS: Five combined features including rate constant, volume of plasma, energy, entropy, and compactness, had the best performance with an accuracy of 91.67%, sensitivity of 91.30%, specificity of 92.06%, and Az value of 0.9427.

CONCLUSION: Combined kinetic and morphological features of 3-D breast MRI is a potentially useful and robust algorithm in the differentiation between benign and malignant lesions.

應用 BR-12 假體於乳房攝影之劑量評估

Application of BR-12 Phantom for Estimation of Breast Dosimetry in Mammography

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PURPOSE: The BR-12 slab is one of important breast-tissue-equivalent materials for the simulation of patient exposures in mammography. The average glandular dose of breast can be estimated by using an appropriate thickness of BR-12 slab. The purpose of this study was to evaluate the equivalent thickness of standard breast for different thicknesses of BR-12 slabs.

MATERIALS AND METHODS: The standard breast with the 0.5-cm-thick adipose tissue layer (central layer with 50% glandularity) was applied in this study. Various thicknesses of BR-12 slab and standard breast were imaged. The tube loading, thickness and tube voltage for each mammogram were collected. The thickness of BR-12 slab that producing the same exposure factors as the standard breast was calculated.

RESULTS: The results from this study show that the equivalent thicknesses of standard breast for 2-, 3-, 4-, 5-, 6- and 7-cm BR-12 slabs were 2.06, 3.08, 4.09, 5.10, 6.12, and 7.11 cm, respectively. The equivalent thickness of standard breast was slightly thicker than the thickness of BR-12 slab.

CONCLUSION: In this study, the equivalent thicknesses of standard breast for different thicknesses of BR-12 slabs were determined. It can provide useful information for mammographic dose survey by using a suitable thickness of BR-12 slab.

PT008-BR

以超音波圖示評論乳房之非腫塊樣病灶

Pictorial Reviews with Ultrasound over Non-mass-like Lesions of Breast

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INTRODUCTION: Breast ultrasonography (US) plays an important role both on detection and characterization of breast masses. Most of mass lesions can be done with BIRADS lexicon, but some lesions, which does not fit the criteria of a mass defined by BIRADS lexicon for US, are so-called non-mass-like lesions, that cover benign and malignant instance. Identification and differentiation of non-mass-like lesions on breast US are therefore very important in enabling accurate interpretation of the US features.

CASE REPORT: The pictorial reviews would demonstrate various non-mass-like ultrasonographic (US) findings. These cases include benign or malignant pathological results. As for a malignant example, ductal carcinoma in situ (DCIS) or invasive lobular carcinoma (ILC) often shows non-mass-like lesions. As for a benign instance, scar formation, DM mastopathy, intraductal papilloma, or lobular carcinoma in situ (LCIS, pre-cancer lesion) may also reveal non-mass-like patterns.

DISCUSSION: We will demonstrate sonographic-pathological correlation with other techniques (such as 3D and elastography) and magnetic resonance imaging (MRI). It is important to differentiate non-mass-like lesions through histopathological proof.

乳管內乳突狀瘤梗塞：病例回顧

Infarcted Intraductal Papilloma of the Breast: A Case Review

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INTRODUCTION: Infarction of intraductal papillomas is an uncommon problem. Infarction may occur in a papilloma either spontaneously or following a prior biopsy. It is difficult in diagnosis on either mammography, ultrasonography, breast magnetic resonance imaging (MRI) and even on fine needle aspiration (FNA) cytology due to featuring of characteristics of malignant tumor.

CASE REPORT: We report a case of pathologic proved infarcted intraductal papilloma.

DISCUSSION: The history, images including mammography, ultrasonography and breast MRI, pathology and literature are reviewed.

PT010-CV

256 切電腦斷層應用於冠狀動脈繞道血管成像之最佳時間窗口和輻射劑量減少策略

Potential Dose Reduction of Optimal ECG-Triggered Tube Current Modulation for Coronary Artery Bypass Graft Imaging with 256-Slice CT

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PURPOSE: To determine the optimal image reconstruction windows in the assessment of coronary artery bypass grafts (CABGs) with 256-slice computed tomography (CT), and to assess their associated optimal pulsing windows for electrocardiogram-triggered tube current modulation (ETCM).

MATERIALS AND METHODS: We recruited 18 patients (three female; mean age 68.9 years) having mean heart rate (HR) of 66.3 beats per minute (bpm) and a heart rate variability of 1.3 bpm for this study. A total of 36 CABGs with 168 segments were evaluated, including 12 internal mammary artery (33.3%) and 24 saphenous vein grafts (66.7%). We reconstructed 20 data sets in 5%-step through 0%-95% of the R-R interval. The image quality of CABGs was assessed by a 5-point scale (1=excellent to 5=non-diagnostic) for each segment (proximal anastomosis, proximal, middle, distal course of graft body, and distal anastomosis). Two reviewers discriminated optimal reconstruction intervals for each CABG segment in each temporal window. Optimal windows for ETCM were also evaluated.

RESULTS: The determined optimal systolic and diastolic reconstruction intervals could be divided into 2 groups with threshold HR = 68. The determined best reconstruction intervals for low heart rate (HR < 68) and high heart rate (HR > 68) were 76.0 ± 2.5% and 45.0 ± 0% respectively. Average image quality scores were 1.7 ± 0.6 with good inter-observer agreement (kappa = 0.79). Image quality was significantly better for saphenous vein grafts versus arterial grafts (P < 0.001). The recommended windows of ETCM for low HR, high HR and all HR groups were 40-50%, 71-81% and 40-96% of R-R interval, respectively. The corresponding dose savings were about 60.8%, 58.7% and 22.7% in that order.

CONCLUSIONS: We determined optimal reconstruction intervals and ETCM windows representing a good compromise between radiation and image quality for following bypass surgery using a 256-slice CT.

利用多切面電腦斷層最新形態特徵預測冠狀動脈疾病之風險 Predict the risk of Coronary Artery Disease Using Novel MDCT Morphological Features

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PURPOSE: To predict the risk of coronary artery disease (CAD) in health examination patients using a combined MDCT morphological features method.

MATERIALS AND METHODS: Study groups comprised 42 subjects who underwent a screening health examination, including laboratory testing and cardiac angiography by 64-slice MDCT images. The experimental group (abnormal cases) had 2 males and 19 females and the control group (normal cases) had 8 males and 13 females. Subject age range was 42-72 (50.9 ± 8.1) and 38-69 (54.9 ± 7.8) years old for normal and abnormal groups, respectively. Three morphological features of images were defined as shape, stiffness, and size on cardiac MDCT images. The t-test, logistic regression, and receiver operating characteristic curve were applied to assess and identify the significant predictors of CAD.

RESULTS: The shape, stiffness, and size of extracted image features were the important risk factors for abnormal group according to the significantly beta values by logistic regression ($P < 0.05$). The shape is shown significant negative beta values in abnormal group (i.e., small shape). The higher stiffness and larger size are shown significant positive beta values in abnormal group. The proposed stiffness, shape, and size computed from image play the important role for abnormal group. The AUC of shape, stiffness and size were 0.808, 0.821, and 0.786 respectively. The large values of stiffness usually indicate the stiff myocardial wall. The average stiff value of myocardial wall measured from MDCT in normal group is about 77.9 (Hounsfield Unit · HU). The higher stiff value reveals lower elasticity of myocardial wall. Hence, the higher stiff value increases the risk of CAD.

CONCLUSION: This study investigated three extracted MDCT imaging features including shape, stiffness, and size. The higher value of stiffness features not only indicates higher risk of abnormal MDCT group, but also is a positive and significant predictor for CAD.

PT012-CV

運用不同臨床心血管危險指數來預測無症狀台灣人冠狀動脈疾病嚴重程度 Using Framingham, PROCAM and SCORE to Predict Severity of Coronary Artery Disease in Asymptomatic Chinese Population

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PURPOSE: We evaluated the ability of prediction of severity of coronary artery disease (CAD) among different clinical risk scores including the Framingham risk score (FRS), PROCAM risk score and systematic coronary risk evaluation (SCORE) in asymptomatic Chinese population.

MATERIALS AND METHODS: From August 2010 to August 2013, we performed a coronary computed tomography angiography (CCTA) using 320-slice multi-detector computed tomography as part of a health check-up protocol in 902 asymptomatic subjects (70.2% male, 56 ± 10 year-old). FRS, PROCAM and SCORE were obtained using web calculator. Obstructive CAD meant that one or more segments of coronary artery had luminal diameter stenosis greater than 50% found on CCTA; severe CAD meant coronary artery had luminal stenosis greater than 70%.

RESULTS: All risk scores significantly correlated with severity of CAD and coronary calcium score ($P < 0.05$). Of the 3 risk scoring systems, the SCORE showed the worst correlation. 277 (30.7%) and 79 (8.8%) subjects were found to have obstructive and severe CAD respectively. In the prediction of obstructive CAD, all three risk scoring systems had similar area under the ROC curves (0.73, 0.73 and 0.72). However, in the prediction of severe CAD, FRS and PROCAM had similar area under the ROC curves (0.73 and 0.71) and better than SCORE (0.68) ($P < 0.05$).

CONCLUSION: Similar ability for prediction of obstructive CAD but inferior ability for severe CAD using SCORE system is found in our study. Cautious usage of clinical risk scoring system for prediction severity of CAD in asymptomatic Chinese is necessary.

使用自動管電流調製下電腦斷層冠狀動脈成像和鈣化評分的器官劑量和散射劑量
Organ Dose and Scattering Dose for CT Coronary Angiography and Calcium Scoring using Automatic Tube Current Modulation

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PURPOSE: The purpose of this study is to investigate organ dose and scattering dose for CT coronary angiography and calcium scoring using automatic tube current modulation.

MATERIALS AND METHODS: Organ doses of an anthropomorphic phantom were estimated using Li F: Mg, Cu, P thermoluminescent dosimeter (TLD) chips. The dose profiles inside and outside the scanning regions were measured.

RESULTS: The dose profiles inside and outside the scanning regions were measured. Effective doses for coronary angiography and calcium scoring without using automatic tube current modulation are respectively 12.72 +/-2.06 and 1.69 +/-0.30 mSv. Using automatic tube current modulation can reduce effective dose by 43% for coronary angiography, and 24-32% for calcium scoring. Scatter doses at the point of 10 cm away from the margin of scanning region decreased to 5-9% of in-plane doses.

DISCUSSION: Using automatic tube current modulation can effectively reduce radiation doses inside the CT scanning region.

無鉛柵經皮瘻管成形術可減少洗腎病患所接受之輻射劑量
Radiation Dose Reduction of Gridless Percutaneous Transluminal Angioplasty in Hemodialytic Patients

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PURPOSE: Grid is used to reduce scatter radiation to the detector. It facilitates better image quality in fluoroscopy but accompanies more radiation dose. Percutaneous transluminal angioplasty (PTA) is widely used to treat failed hemodialysis access in end-stage renal disease patients. These patients expose to radiation frequently and inevitably. This study is to see if gridless PTA can significantly reduce radiation dose without compromise of procedure safety.

MATERIALS AND METHODS: There were 160 hemodialytic patients who received PTA enrolled in this study. 80 patients were done by small detector (8 inch x 8 inch) in cath lab. The other 80 patients were done by large detector (12 inch x 16 inch) in digital subtraction angiography (DSA) room. In each facility, there were 40 patients in each grid and gridless group. Dose was recorded by dosimeter mounted at detector. Procedure safety is defined as any mechanical complications caused by guidewire or balloon catheter during procedure.

RESULTS: In cath lab, gridless PTA significantly reduce average dose comparing with traditional PTA (0.0766 ± 0.0096 v.s. 0.1874 ± 0.0193 mGy/s, P < 0.0001, N=40). In DSA room, gridless PTA also significantly reduce average dose comparing with traditional PTA (0.0471 ± 0.0047 v.s. 0.1363 ± 0.0294 mGy/s, P=0.0037, N=40). There were no mechanical complications developed in each grid and gridless groups.

CONCLUSION: Gridless PTA can significantly reduce radiation dose without additional complications. To treat patients with failed hemodialytic access, gridless PTA is suggested as a routine procedure.

器官導向管電流調控與鉍屏蔽在冠狀動脈鈣化的比較：假體實驗

Comparison of Organ-Based Tube Current Modulation and Bismuth Shield for Coronary Artery Calcium Score: Phantom Study

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PURPOSE: This purpose of our study was to compare the coronary artery calcium score using organ-based tube current modulation (OBTCM) and in-plane bismuth shield.

MATERIALS AND METHODS: An anthropomorphic phantom (QRM GmbH, Germany) with a calibration insert for the quantification of coronary artery calcium was scanned with a 128-slice CT scanner (Definition Flash, Siemens, Germany). The CaS between the OBTCM scan and the bismuth scan was assessed.

RESULTS: OBTCM is the latest technique for radiation dose reduction to radiosensitive organs, such as eye lens, thyroid, and breast, during CT scans. Bismuth shield can be used to protect those organs as well but the image noise or streak artifact can change the coronary calcium results.

CONCLUSION: The coronary artery calcium deposit is powerful marker in screening studies for coronary artery disease. Organ-based tube current modulation or bismuth shield is an effective method to reduce breast dose during CT scans.

心包膜疾病的影像表現

Imaging Findings of Pericardial Disease

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PURPOSE: We retrospectively review the CT images of pericardial disease. The purpose of this post is to review the image findings of pericardial disease in their detection and diagnosis.

MATERIALS AND METHODS: From January 2010 to December 2013, 12 different pericardial diseases are collected, including pericarditis, constrictive pericarditis; pneumopericardium due to esophageal rupture and gastric perforation; pericardial effusion; cardiac tamponade; pericardial hematoma due to aortic dissection, perforation of myocardium and ruptured of coronary artery pseudoaneurysm; pericardium mesothelioma; metastases in pericardium by lung cancer and HCC.

RESULTS: The pericardium is a double-walled sac containing the heart and the roots of the great vessels. The pericardial disease is uncommon and severe; the different etiology would demonstrate different imaging findings.

CONCLUSION: We performed a retrospective analysis of the CT features in these 12 pericardial diseases.

冠狀動脈繞道手術後病人左心室射出分率的評估：比較心臟電影磁共振成像與二維心臟超音波

Left Ventricular Ejection Fraction in Patients Following Coronary Artery Bypass Graft (CABG) Surgery: Comparison of Cine Cardiac Magnetic Resonance Imaging and Two-Dimensional Echocardiography

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PURPOSE: The aim of this study is to evaluate the agreement of left ventricular ejection fraction measured by cine cardiac magnetic resonance imaging (MRI) and two-dimensional (2D) echocardiography in patients post CABG surgery.

MATERIALS AND METHODS: From March 2013 to November 2013, 13 patients post CABG surgery underwent cine cardiac MRI in our institute. Cine steady-state frequency precession (SSFP) is typically performed for both visual assessment of wall motion abnormalities from standard cardiac views (2, 3 and 4 chambers with short axis views) and also quantitative assessment of cardiac function. The ventricular function can be calculated by post-processing software after obtaining a stack of function covering the entire ventricle. Two-dimensional echocardiography was also performed for all these patients on separate occasions by cardiologists and their left ventricular ejection fraction (LVEF) was calculated. Impaired LV function was defined as LVEF < 50% measured by conventional 2D echocardiography. We compared the left ventricular ejection fraction calculated by cine MRI with that by 2D echocardiography. Correlation coefficient was calculated to see the relationship between them.

RESULTS: Significant correlation of left ventricular ejection fraction estimated by cine cardiac MRI and 2D echocardiography was found (correlation coefficient $r=0.80$, $P=0.001$). MRI successfully detected 86% patients (6/7) with impaired LV function, yielded a sensitivity of 0.83 and a specificity of 0.86, and an overall accuracy of 0.85.

CONCLUSION: Cine cardiac MRI is a reliable tool to detect impaired global ejection function after CABG surgery.

特定位置心包膜脂肪組織厚度與阻塞性冠狀動脈疾病關聯性：系統性綜述和觀察性研究的統合(meta)分析

The Relation of Location-Specific Epicardial Adipose Tissue Thickness and the Obstructive Coronary Artery Disease: Systemic Review and Meta-Analysis of Observational Studies

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PURPOSE: There is growing evidence about the importance of epicardial adiposity on cardiometabolic risk. However the relation of location-specific epicardial adipose tissue (EAT) thickness to coronary atherosclerotic burden is still unclear.

METHODS: This meta-analysis was used to study the relations between location specific EAT thickness and obstructive coronary artery disease (CAD). A systemic literature search to identify eligible studies that met the inclusion criteria from the beginning until October 2013. We conducted the meta-analysis of all included 10 published studies to provide comprehensive insight on the association of location-specific EAT thickness and the obstructive CAD. Pre-specified subgroup analyses were performed according to ethnicity, diagnostic tools for CAD, and measurement tool if presence of high heterogeneity between studies. Potential publication bias was also assessed.

RESULTS: We identified ten observed studies with a total of 1625 subjects for planned comparison. With regard to the association between obstructive CAD and location-specific EAT thickness at right ventricular free wall, caution is warranted. The pooled estimate from the meta-analysis showed that location-specific EAT thickness at right ventricular free wall was significant higher in the CAD group than non-CAD group (standardized mean difference: 0.70 mm, 95% CI: 0.26-1.13, P = 0.002), although heterogeneity was high (I² = 93%). In the subgroup analysis, the "diagnostic tools for CAD" or "measurement tool of EAT thickness" are potential major sources of heterogeneity between studies. With regard to location-specific EAT thickness at left atrioventricular (AV) groove, it was significantly higher in the CAD group than non-CAD group (standardized mean difference: 0.74 mm, 95% CI: 0.55-0.92, P < 0.00001; I² = 0%).

CONCLUSION: Our meta-analysis suggests that significantly elevated location-specific EAT thickness at left AV groove is associated with obstructive CAD. Based on the current evidences, the location-specific EAT thickness at left AV groove appears to be a good predictor in obstructive CAD, especially in Asian populations. Furthermore well-designed cohort studies are warranted because of current limited number of studies.

巨大之主動脈竇血管瘤：病例報告

Giant Aneurysm of Sinus of Valsalva: A Case Report

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INTRODUCTION: Aneurysms of the sinus of Valsalva are very uncommon, with an incidence ranging from 0.1 to 3.5% of all congenital heart defects. Aneurysms of the sinus of Valsalva are usually diagnosed as an incidental finding or after an acute rupture into an adjacent cardiac structure. Before rupture, aneurysms of the sinus of Valsalva may present with conduction-system abnormalities attributable to erosion into the interventricular septum, thromboembolism originating in the aneurysm sac, and myocardial ischemia attributable to coronary compression.

CASE REPORT: A 58-year-old male patient was presented with progressive shortness of breath for several months and tachycardia. MDCT and cardiac echography showed unusually large aneurysm of sinus of Valsalva occupying right atrium with external compression of right ventricle and right ventricular outflow tract. The patient recovered well after operation.

DISCUSSION: The clinical manifestations of Valsalva sinus aneurysms vary widely. When symptoms are present, they often are related to aneurysm rupture mass effect on adjacent cardiac structures. In general, nonruptured aneurysms are asymptomatic more often than ruptured aneurysms are, and they may be incidentally found at imaging performed to evaluate heart murmurs or abnormal cardiac contours seen on radiographs. At imaging, the criteria for diagnosing a Valsalva sinus aneurysm include an origin above the aortic annulus, a sacular shape, and normal dimensions of the adjacent aortic root and ascending aorta. ECG-gated contrast material-enhanced multi-section CT provides much better spatial resolution of cardiac structures than that attainable with other imaging methods.

心外膜血管瘤：心臟血管瘤少見的生長位置

Epicardial Hemangioma: Unusual location for a Cardiac Hemangioma

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INTRODUCTION: Cardiac hemangioma is a rare cardiac tumor. Most cardiac hemangiomas arise from ventricles or interventricular septum. We present a hemangioma originating from the epicardium.

CASE REPORT: A 68-year-old male suffered from chest tightness and shortness of breath for several days. Distant heart sound was found during physical examination. The echocardiography showed massive pericardial effusion. CT performed for further work-up revealed a well-defined nodule, about 2 cm in diameter, in the pericardial space. There were intensely enhanced component and fatty component of the nodule. In the surgery, a soft dark reddish tumor with easy contact bleeding originating from the epicardium was found. Microscopic examination revealed capillary type vessels, and adipose tissue. The final diagnosis was an epicardial hemangioma.

DISCUSSION: Cardiac hemangiomas are classified as cavernous, capillary, or arteriovenous type. In the case, the tumor is capillary hemangioma and the capillary type vessels demonstrate intensely enhanced areas in the CT examination. The tumor also contains abundant fat tissue which is compatible with the hypodense area. The radiologic-pathological correlation helps us to learn the characteristics of the tumor and to make a preoperative diagnosis next time.

PT021-CV

心臟淋巴瘤：四病例報告

Image Characteristics of Cardiac Lymphoma: Four Cases Report

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INTRODUCTION: Primary cardiac lymphoma is a rare disease. It accounts for 1.3% of primary cardiac tumors and 0.5% of extranodal lymphomas. The clinical manifestations are not specific. Therefore, four cases were reviewed to correlate the clinical symptoms, signs, characteristics at cardiac computer tomography of cardiac lymphoma and the mimics.

CASE REPORT: From 2009 to 2011, 4 patients (2 men and 2 women; mean age: 56.5 years) were admitted for different symptoms including arrhythmia, chest tightness or progressive dyspnea. Three of these four patients received pericardiectomy with pathologic proof of cardiac lymphoma and the other one was diagnosed as acute leukemia with cardiac involvement. Their clinical history and an characteristics of cardiac computer tomography images including: 1. Presence of pericardial effusion, 2. Enhancement of tumor, 3. Spreading pattern of tumor, 4. Effects of tumor on coronary arteries, 5. Involvement of myocardium were analyzed. Clinical manifestations are various. Three of all patients present chest pain and progressive dyspnea. Two of them showed individually newly onset sick sinus syndrome with T-wave inversion and diffuse ST-T change in electrocardiography. Another two patients presented fever with chills and generalized edema respectively. Cardiac echography showed cardiac mass in all patients. The cardiac computer tomography showed the enhancement of cardiac lymphoma ranges from heterogeneously poor to strong. Pericardial effusion was seen in two patients. Infiltrative soft tissue at pericardial space, thick pericardium, nodulation at epicardial fat, obliterated epicardial fat plane over myocardium were shown in all patients consistent with the pathophysiological lymphangitic disease pattern. All the infiltrative masses encasement of coronary arteries with patency of blood flow.

DISCUSSION: The characteristics of cardiac lymphoma at computer tomography are ill-defined and infiltrative right atrial mass accompanying with pericardial thickening or effusion as well as infiltration along the atrial/ventricular wall and maybe myocardium invasion. Tumoral enhancement is the key to differentiate other mimics such as hematoma.

單側肺動脈無發育合併反覆咳血症狀：病例報告

Isolated Unilateral Absence of a Pulmonary Artery with Recurrent Hemoptysis: A Case Report

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INTRODUCTION: Unilateral absence of a pulmonary artery (UAPA) is an uncommon condition with an estimated prevalence of 1 in 200,000 young adults. Patients with isolated UAPA can remain asymptomatic into late adulthood but usually have symptoms such as chronic cough, dyspnea, chest pain, hemoptysis or recurrent infections. Because of the rarity of this condition and its nonspecific presentation, diagnosis can be difficult and delayed.

CASE REPORT: We report a case of 37-year-old man who presented with recurrent intermittent hemoptysis for several years. A computed tomography (CT) angiography demonstrated a hypoplastic right lung and absence of right main pulmonary artery. There were also prominent bronchial and intercostal arteries from descending thoracic aorta as well as engorged Rt internal mammary artery and Rt inferior phrenic arteries, which could play the role of pulmonary perfusion to right lung.

DISCUSSION: UAPA usually associated with other cardiac anomalies, such as tetralogy of Fallot, cardiac septal defect and patent ductus arteriosus. Even rarely, UAPA can also occur in an isolated manner. CT plays an important role to reach a correct diagnosis and can well demonstrate the concurrent vascular anomaly and lung conditions.

PT023-CV

原發性心臟淋巴癌：病例報告

Primary Cardiac Lymphoma: A Case Report

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INTRODUCTION: Primary cardiac lymphoma is defined as extranodal lymphoma involving only the heart and/or pericardium. It is a rare entity and so far, only about 200 cases been reported in the literature.

CASE REPORT: A 73-year-old woman presented with progressive chest tightness for several days. She has medical history of type 2 diabetes mellitus and hypertension for years, both under control. In emergency setting, a chest computed tomography was performed and showed a suspicious cardiac mass at right atrium (RA) with marked pericardial effusion. Cardiac MRI showed a lobulated mass in RA with extension to superior vena cava (SVC). She had excision of RA, SVC, inferior vena cava and septum and permanent pacemaker implantation. Pathology revealed malignant diffuse large B-cell lymphoma.

DISCUSSION: Primary cardiac lymphoma most commonly manifest as an ill-defined, infiltrative mass in the myocardium, often with an associated pericardial effusion. The order of rate of chamber involvement was RA > RV > left atrium (LA) > left ventricle (LV). At CT, lymphomas commonly appear as an infiltrating epicardial or myocardial mass that is often isoattenuating to hypoattenuating relative to myocardium. With MR imaging, masses can be relatively hypointense on T1-weighted images and hyperintense on T2-weighted images. Contrast enhancement is frequent and may be homogeneous or heterogeneous. Cardiac lymphoma has the tendency to extend along the epicardial surfaces of the heart, primarily encasing adjacent structures. Primary cardiac lymphoma is rare and most commonly located in RA. It usually appears as an infiltrative mass in the myocardium, often with an associated pericardial effusion.

奇靜脈延續左下腔靜脈回心：多排數電腦斷層血管攝影影像表現

Azygos Continuation of the Left Inferior Vena Cava: Multi-detector Computed Tomography Angiography Imaging Findings

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PURPOSE: To present azygos continuation of the left inferior vena cava (IVC) using multi-detector computed tomography (MDCT) angiography. Embryogenesis is also reviewed.

MATERIAL AND METHODS: A 31 y/o female was suspected to have a right side mediastinum tumor. 64-MDCT angiography was performed for the diagnosis. Multiplanar reconstruction (MPR) and volume rendering (VR) were also demonstrated.

RESULTS: The hepatic veins join together to form suprahepatic IVC and drain into the right atrium. The left IVC ends at the left renal vein, crossing posterior to the aorta to join the right IVC. Then the right IVC remains as the azygos vein, missing hepatic veins. The azygos vein joins the superior vena cava (SVC) at the normal location in the right paratracheal space. No duplication infrahepatic IVC observed.

CONCLUSION: This case report presents radiological images of an unusual variation. Correct interpretation of congenital anomalies of the inferior vena cava is essential to avoid misdiagnosis of mass or lymphadenopathy. To provide correct anatomy information before surgery and medical procedure.

以高螺旋比掃描模式觀察冠狀動脈繞道手術：病例報告

Coronary artery Bypass Graft CT Examination with High pitch Scan Mode: Case Report

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INTRODUCTION: Coronary artery bypass graft (CABG) surgery is one option to treat heart disease. CABG surgery is a procedure that restores blood flow to patient's heart muscle by diverting the flow of blood around a section of a blocked artery in their heart. Coronary bypass surgery uses a healthy blood vessel taken from their leg, arm, chest or abdomen and connects it to the other arteries in their heart so that blood is bypassed around the diseased or blocked area. After a coronary bypass surgery, blood flow to their heart is improved.

CASE REPORT: We report a patient has undergone a CABG surgery and needs a follow-up CT examination. The patient's LGEA from left gastric epiploic artery to distal part of RCA and PDA. She underwent a CT scan ranged from heart to iliac using a high pitch mode CT scan in order to reduce scanning time and the motion artifact because the patient can not cooperate with dementia.

DISCUSSION: High pitch scan modes of a Definition Flash CT scanner improved the imaging efficiency and provide a high quality CT image. The overall radiation dose to the patient was only 1.3 mSv.

台中榮民總醫院低劑量肺癌篩檢：毛玻璃樣斑塊之重要性

Low-dose CT as a Screening of Lung Cancer at TCVGH: The Significance of GGO Nodules

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PURPOSE: Ground-glass opacity (GGO) nodules have been increasingly detected by low-dose CT (LDCT). Although GGO nodules suggests in situ neoplastic lesion in the peripheral lung, variety in management remains. The purpose of this study was to evaluate the pathologic and radiologic characteristics of GGO in order to develop guidelines for these lesions at TCVGH.

MATERIALS AND METHODS: From August 2008 to November 2013, 2,021 asymptomatic Taiwanese adults with ≥ 23 year of age underwent LDCT for lung cancer screening. Among patients with GGO nodules, 84 received surgical resection.

RESULTS: The histologic diagnoses were adenocarcinoma in situ (AIS, formerly BAC) in 33 patients, minimally invasive adenocarcinoma (MIA, formerly adenocarcinoma with mixed subtypes) in 11 patients, and atypical adenomatous hyperplasia (AAH) in 20 patients. Larger GGO nodules (≥ 1 cm) and GGO nodules with cystic and solid components on LDCT were highly associated with adenocarcinoma.

CONCLUSION: LDCT screening is helpful in detecting early lung cancer in asymptomatic patients. The differential diagnosis of GGO are many, but if the lesion with cystic or solid components, or progressive in size, and does not resolve in follow-up, surgical intervention is mandatory for its association with high incidence of adenocarcinoma.

PT027-CH

冠狀動脈電腦斷層之偶然發現的未確定肺結節

Indeterminate Incidental Lung Nodules in Coronary Computed Tomography Angiography

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PURPOSE: To retrospectively review the characteristics of the indeterminate incidental lung nodules seen at screening coronary CT angiography (CCTA).

MATERIALS AND METHODS: From January 2011 to December 2012, 1239 subjects received screening coronary computed tomography angiography (CCTA). We excluded nodules with typical benign calcifications and nodules with diameter less than 4mm. There were a total of 24 subjects with indeterminate lung nodules, and the analysis of characters of these lung nodules was performed.

RESULTS: A total of 24 indeterminate nodules (16 solid, 8 ground-glass opacity nodules [GGNs]) were detected at screening CCTA in 24 subjects. Of the 24 subjects, only 12 subjects had follow up chest CT study. Pulmonary adenocarcinoma was proved in one subject with persistent ground-glass nodule.

CONCLUSION: The number of indeterminate incidental lung nodules found at screening coronary CT angiography is small but important, and all should be followed according to the current guideline.

關於臨床上懷疑主動脈疾患之電腦斷層血管攝影初步報告

Preliminary Experience of Chest Computed Tomography Angiography in Confirmation of Clinically Suspected Aortic Syndrome

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PURPOSE: To evaluate the positive rate of the chest computed tomography angiography (CTA) in the clinically suspicious cases of aortic syndrome.

MATERIALS AND METHODS: We reviewed the entire chest CTA of consecutive 79 patients who were highly suspected aortic syndrome by clinician at our Emergency Department from 16 September, 2013 to 16 December, 2013. Analysis of the positive rate and disease patterns was done.

RESULTS: Totally 79 patients were included. The mean age of these patients were 62.4 years old (range: 36-99 years old). Fifty one of them were males and 28 are females. Sixteen patients (20.2%) including 13 males and 3 females were found to have aortic dissection (n=9), abdominal aneurysm (n=4), aneurysm rupture (n=2) and intramural hematoma (n=1). Other relevant findings included heart failure (n=2), acute pancreatitis (n=1), empyema (n=1) and pneumonia (n=1). Almost all the patients had calcified plaque in coronary arteries.

CONCLUSION: Positive rate of the aortic syndrome found in chest CTA of this study was 20.2%. The relative low diagnostic accuracy may suggest that clinicians should be aware of the other pathologic condition which may mimic the aortic syndrome.

PT029-CH

以類似肺癌併骨轉移為表現之散在性隱球菌感染：病例報告

Disseminated Cryptococcus Mimicking Lung Cancer with Bone Metastasis: A Case Report

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INTRODUCTION: We introduce a case of disseminated cryptococcus with initial presentation mimicking lung cancer and bone metastasis.

CASE REPORT: A case of 58-year-old man suffered from upper back pain for 2 months. Self-paid PET/CT revealed multiple intense uptack foci of F-18FDG at RUL of lung, T5 spine and left ilium. Under the impression of lung cancer with multiple bone metastases, chest CT was performed and revealed a small thin-wall cavitary lesion at RML with a small mural nodule, abutting on the right minor fissure. Osteolytic lesion at left side T5 vertebra with bone destruction, mild paraspinal soft tissue and mild intraspinal invasion was also noted. Follow up cervical spine MRI due to progressive neurological deficits showed progression of T5 vertebral collapse, subligamentous soft tissue and spinal cord compression. Mass removal and decompressive laminectomy of T5 confirmed the diagnosis of disseminated cryptococcosis.

DISCUSSION: Osseous involvement is not a rare manifestation of disseminated cryptococcus. Due to the nonspecific osteolytic nature of cryptococcal osteomyelitis, it might be mistaken as malignancy or metastasis. PET/CT might have no contribution in the differential diagnosis between infectious/ inflammatory process and malignant tumor, so biopsy still should be carried out.

頸部異位胸腺瘤：罕見的胸腺腫瘤發生位置**Ectopic Cervical Thymoma: A Rare Site for a Thymus Neoplasm**

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INTRODUCTION: The ectopic cervical thymoma is a rare site for a thymus neoplasm. It is frequently confused with neck soft tissue mass of uncertain diagnosis until a histologic diagnosis is made.

CASE REPORT: We report a case of ectopic cervical thymoma. The case manifested as a mass lesion at the left lower neck, displacing the trachea, and was originally misdiagnosed as thyroid mass. At surgical exploration, the mass was found to be adjacent to but separate from the left lobe of the thyroid. The pathologic diagnosis revealed a thymoma, WHO type AB.

DISCUSSION: Radiologists as well as clinicians should be aware of the existence of this disease so that it can be identified correctly.

多發性肺部子宮內膜異位症：罕見病例報告及文獻回顧**Multiple Pulmonary Endometriosis: A Rare Case Report and Literature Review**

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INTRODUCTION: A case of 37-year-old women with no systemic disease, but a small nodule in left lower lung was found on chest radiograph during regular health examination. The other cystic nodule was found in right lower lung by computed tomography only. Histologic subsequent to thoracotomy confirmed the diagnosis of pulmonary endometriosis.

CASE REPORT: Chest CT findings reveals a nearly 1.5x1.1x1.1 cm cavity-like nodule with eccentric soft tissue density at posterior aspect of RLL of lung. VATS wedge resection of visceral pleura or lung parenchyma, partial pleurectomy. After surgical resection, the case shows a cystic nodular lesion. Histologically, the growth of endometrial glands and stroma in the lung or on the pleural surface microscopically, the nodule shows proliferation of branching endometrium-like glands, surrounded by endometrium-like stromal cells with spiral arterioles. The glands are lined by tall columnar, ciliated cells, similar to the morphology of endometrial glands at proliferative phase. Immunohistochemically, the glands express ER, PgR, vimentin and membranous beta-catenin. According to the morphology and immunohistochemical study, pulmonary endometriosis is suggested. Although most of the nodular density results in nonspecific findings, familiar with the imaging features such as nodular shape, cystic components, and others may be helpful for radiologist in making adequate differential diagnosis.

DISCUSSION: This case study investigates the use of CT chest images in order to gain further knowledge of the characteristics of unusual nodular correlated with pathology findings to improve the difficulty in differential diagnosis.

電腦斷層-正子掃描影像原發性心包膜間質瘤：病例報告
CT-PET images of primary Pericardial Mesothelioma: A Case Report

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INTRODUCTION: Primary pericardial malignant mesothelioma is an extremely rare neoplasm that arises from the pericardial mesothelial cell layers. Clinical symptoms and signs are frequently nonspecific, and the diagnosis is usually made after tissue proof.

CASE REPORT: We present a 55 year old man presented with chest tightness for 10 days. During physical examination, bilateral neck enlarged lymph nodes with tenderness. The diagnosis was established after biopsy of cervical lymphadenopathy which showed metastases. Chest CT and PET scan showed massive pericardial effusion with bilateral pleural effusions.

DISCUSSION: There is no standard treatment for pericardial mesothelioma; nonetheless, radical surgery is the mainstay of therapy for localized disease. The neoplasm is highly aggressive and carries a dismal prognosis with an overall survival of less than six months.

PT033-CH

異常體動脈供應左下肺底部分節：病例報告
Anomalous Systemic Arterial Supply to Normal Basal Segments of Left Lower Lobe:
A Case Report

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INTRODUCTION: Systemic arterial supply to pulmonary parenchyma without sequestration is a rare congenital anomaly. The affected pulmonary has normal bronchial connection and aberrant arterial supply from the aorta. The malformation generally occurs in the posterobasal segment of the left lower lobe. We report a case of anomalous systemic arterial supply to the anteromedial and lateral segments of left lower lobe. The diagnosis was made on a contrast-enhanced MDCT scan which provided the CT angiographies of the pulmonary vessels and the thoracic aorta and CT bronchography.

CASE REPORT: A 28 year-old woman with an unremarkable medical history was referred to our hospital for evaluation of an abnormal shadow on a chest roentgenogram image. She did not have any symptom. Physical examination revealed bruits in the left lower lung. A chest roentgenogram showed multiple tiny nodular opacities in the left lower lobe. The contrast-enhanced chest CT scan showed engorged vessels originating from the descending aorta at T8 level and supplying the anteromedial and lateral segments of the left lower lobe, which lacked supply of the pulmonary artery. The distribution of the pulmonary veins and bronchial trees were normal. The pulmonary parenchyma of the two segments had increased attenuation.

DISCUSSION: Thought most of the patients are asymptomatic, systemic arterial supply to normal pulmonary parenchyma can result in several complications, including hemoptysis, dyspnea, left-to-left shunt, and congestive failure. A contrast-enhanced chest CT scan is useful in making diagnosis before an invasive treatment such as lobectomy or transarterial embolization.

胸腔降主動脈扭曲似一肺腫塊於胸腔X光片側位照：病例報告
Tortuosity of Lower Descending Thoracic Aorta like a Lung Mass in the Lateral View
CXR: A Case Report

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INTRODUCTION: CXR (PA & lateral view) & chest CT are good methods to check the lung lesion.
CASE REPORT: A 70-year-old male suffered from mild cough for one week and visited our chest OPD. Health examination CXR at other hospital told him a nodule in the left lung. Physical examination showed slight rales in the left lower chest. CXR (PA & lateral view) & chest CT were performed. CXR (PA view) at our hospital showed mild blunting of left costophrenic angle and CXR (lateral view) showed a mass-like lesion in the retrocardiac prevertebral lower lung region. Non-contrast chest CT showed tortuosity of lower descending thoracic aorta and no lung mass lesion. Coronal CT images clearly showed tortuosity of lower descending thoracic aorta. Nearly no similar lateral view CXR image found at previous literatures.
DISCUSSION: Chest CT study is necessary when a mass-like lesion found at the retrocardiac prevertebral region in the lateral view CXR. Differential diagnoses of lung mass included tumor, metastasis, abscess, pseudotumor, pneumonia & round atelectasis. Other less common entities included pulmonary AVM, hematoma, bronchogenic cyst, pulmonary sequestration and hydatid cyst. Tortuosity of lower thoracic aorta like a lung tumor is rare. Wrong diagnosis is disaster. CT of chest is useful to avoid this disaster.

PT035-GI

紋理貼圖與電子式切片技術應用於電腦斷層虛擬腸鏡之臨床評估：以電腦斷層虛擬大腸鏡為例
Clinical Evaluation of the Texture Mapping and Electronic Biopsy Methods of CT Endoscope: A
CT Virtual Colonoscopy Example

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PURPOSE: Endoluminal view is an important point of view for the diagnosis and treatment of intraluminal lesions. CT colonoscopy (CTC) is an important computer-based alternative to real endoscope and is complementary to the real endoscope. The purpose of the study is clinical evaluation of the display methods of CTC using texture mapping, focal texture mapping and electronic biopsy to improve shortcoming of routine surface rendering method.

MATERIALS AND METHODS: From March, 2010 to May, 2013, 17 patients (7 men, 10 women and age from 31 to 83 years old) with thirty-three various endoluminal lesions including stool, polyps, cancers, retention fluid and ileocecal valves were recruited in the study. Two radiologists were asked to compare texture mapping, focal texture mapping and electronic biopsy of the above endoluminal lesions in CTC respectively with routine surface rendering methods. Four variables, steric contour, surface texture, inner texture (only in electronic biopsy method), and confidence of classification, were accessed by using a 5-point scale with higher scores denoting a better experience.

RESULTS: There is significant improvement of the surface texture of endoluminal lesions in texture mapping, focal texture mapping methods and inner texture of electronic biopsy method (paired t test: $p < 0.05$) compared with routine surface rendering with still preservation of lesions' contour. These methods significantly improve the confidence of pathological classification of endoluminal lesions, especially in focal texture mapping and electronic biopsy method (paired t test: $p < 0.05$). The agreement of the two radiologists is high and statistically significant. All the evaluation results are verified by the sectional CT images.

CONCLUSION: Besides the three dimensional appearance also seen in surface rendering, the surface and inner textural information of the stereo endoluminal lesions can only be seen in the textural mapping and electronic biopsy methods. Our experimental results are expected to be helpful in differentiation between various endoluminal lesions in CTC.

硬化性包膜的腹膜炎之電腦斷層影像：病例報告
CT Findings of Sclerosing Encapsulating Peritonitis: A Case Report

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INTRODUCTION: Sclerosing encapsulating peritonitis (SEP) is a rare and serious complication in patients under continuous ambulatory peritoneal dialysis (CAPD). Herein we report a rare case of SEP about its CT findings.

CASE REPORT: A 30-year-old male patient had received CAPD for 7 years and changed to receive hemodialysis due to intractable peritonitis. Then he was admitted to our hospital due to persistent abdominal fullness for 3 months after removal of peritoneal dialysis tube. Besides, bloody ascites was noted during peritoneal drainage. Laboratory test revealed anemia (Hb= 6.6 g/dL) and elevated serum CRP level (107.3 mg/L). Abdominal CT showed massive ascites, thickened enhancing peritoneum and a huge septated cyst-like lesion occupying whole abdomen with posterior displacement of bowel loops. Laparoscopic exploration and peritoneal biopsy was performed and confirmed the diagnosis of encapsulating peritoneal sclerosis. After adequate medical treatment including corticosteroid and tamoxifen administration, he got recovered gradually.

DISCUSSION: SEP is a serious life threatening complication, and most cases had a history of long-term CAPD duration. CT imaging may facilitate an early diagnosis to enable appropriate management.

罕見的胃部胃腸道基質瘤影像呈現巨大多囊狀腫瘤：病例報告
Rare Imaging Presentation of a Gastric GIST with a Huge Multiloculated Cystic Mass:
A Case Report

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INTRODUCTION: Large abdominal multiloculated cystic mass posed a challenge to radiologists in determining tumor origin. We report a rare imaging presentation of a gastric GIST.

CASE REPORT: A 55-year-old male patient was admitted to our hospital with complaints of poor appetite, abdominal distension, nausea and vomiting for a couple of days. He had a history of operation for bowel strangulation with colostomy. Laboratory test results were within normal range. Abdominal CT done initially at the emergent department showed a huge multiloculated cystic mass (27.1cm in largest diameter) with walled & septal contrast enhancement, some solid components in the margin and related displacement of adjacent bowels. Transhepatic drainage was done by the clinician for relief of severe abdominal distension. Follow-up CT during hospitalization revealed decreased cystic mass (22.3cm in largest diameter) and two submucosal masses (3.4cm & 2.5cm respectively) over gastric lower body. Endoscopic biopsy confirmed the diagnosis of gastric GIST and then surgical resection was done smoothly.

DISCUSSION: The differential diagnosis of large cystic lesions in the abdomen must include gastrointestinal stromal tumors with multiloculated cystic change. The origin of a large gastrointestinal stromal tumor may be difficult to determine.

結腸的混合腺癌及卵黃囊瘤：病例報告

Combined Colonic Adenocarcinoma and Yolk Sac Tumor with Hepatic Metastasis:
A Case Report

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INTRODUCTION: Yolk sac tumors (YST), a type of germ cell tumors, represent a group of neoplasms arising from the primitive endoderm. However, they rarely arise in extragonadal sites, and only a small number of case reports on pure or mixed colon yolk sac tumors have been reported in the English literature.

CASE REPORT: We present the case of a 39-year-old woman with mixed colonic neoplasm, who had hepatic and lymph node metastases at presentation. While initial pathology after surgical intervention indicated only adenocarcinoma, poor response to chemotherapy prompted a review of resected specimen, which revealed a germ cell component of the colon tumor. Furthermore, pathologic examination showed the two different malignancies to have metastasized to separate hepatic lesions.

DISCUSSION: Neoplasms with mixed carcinoma and YST components are difficult to diagnose by clinical or imaging techniques, although persistent elevation of serum markers such as alpha-fetoprotein, as in our case patient, may point to the existence of tumor cells with embryonic characteristics. Even if pathologic examination shows a relatively common malignancy, careful monitoring of subsequent clinical and radiographic responses to chemotherapy is needed to reveal the existence of a second, rarer neoplasm.

PT039-GI

直腸癌之膽道轉移：病例報告

Intraductal Biliary Metastasis from Rectal Cancer: A Case Report

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INTRODUCTION: Malignant biliary obstruction frequently is caused by metastatic disease, but an intraductal metastasis is extremely rare.

CASE REPORT: A 78 years old male patient had undergone CCRT and Hartmann's operation for recurrent rectal cancer one year before. CT revealed gradually dilatation of a branch of left intrahepatic duct during one-year regular follow up. MRCP was performed to show a space-taking lesion in the proximal left intra-hepatic duct causing distal dilatation. He received left hepatectomy and the pathologic result shows adenocarcinoma from rectal cancer.

DISCUSSION: An intraductal lesion in the non-cirrhotic liver is found in a patient with a history of colorectal cancer may suggest the presence of intraductal metastasis rather than double primary intraductal cholangiocarcinoma.

總膽管囊腫併發巨大乳頭狀腺瘤：病例報告

Choledochal Cyst with Giant Papillary Adenoma: A Case Report

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INTRODUCTION: Choledochal cyst is a rare medical condition, which is more common in women. Choledochal cyst may complicated with cholangitis, stone formation, recurrent pancreatitis, cirrhosis, and portal hypertension. Another complication of choledochal cyst is high risk associated with neoplasm.

CASE REPORT: We present a case of giant papillary adenoma arising in a choledochal cyst in a 56-year-old woman.

DISCUSSION: Initial sonography showed a cystic tumor with solid compartment at liver hilum. Further CT and MRI imaging study showed the cystic tumor at liver hilum may arising from severe dilated CBD. Surgical resection of the tumor was performed and the pathological study showed choledochal cyst with papillary adenoma.

胃底部憩室偽裝成左腎上腺腫塊：病例報告

Gastric Diverticulum Mimicking Adrenal Cystic Mass on the Abdominal CT: A Case Report

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INTRODUCTION: Gastric diverticulum is a rare incidental finding and may have variable symptoms. However, it is generally asymptomatic. The gender of gastric diverticulum has no difference and mainly distributed in fifth and sixth decades. It seldom results in complication, such as upper gastrointestinal bleeding or perforation. We presented a case of gastric diverticulum mimicking adrenal cystic mass on the abdominal computed tomography (CT) during his healthy examination.

CASE REPORT: This 43 year-old woman took healthy examination recently. The abdominal CT incidentally showed a 3.2cm left adrenal mass. She came to our nephrology out-patient clinic and then the abdominal CT with intravenous contrast medium was arranged for further evaluation. An outpunching at the gastric fundus which herniated into left suprarenal region was noted and showed clear fat plane with left adrenal gland. In addition, air-fluid level within it is also found on this CT study. Gastric diverticulum is more favored than left adrenal mass. No specific treatment was suggested for her gastric diverticulum due to no symptoms.

DISCUSSION: Gastric diverticulum is usually detected on the routine radiology examination, such as upper gastrointestinal series or computed tomography. The most common location of gastric diverticulum is posterior wall of gastric fundus. The accurate diagnosis is accomplished by upper gastrointestinal series or endoscope. However, the gastric diverticulum may be missed due to its narrowing neck. There is no specific treatment for asymptomatic gastric diverticulum. The diverticulum of gastric fundus may appear at the expected location of left adrenal gland. In addition, the fluid-filled gastric diverticulum often presented as mass-like lesion. The coronal view of computed tomography helped us distinguish the relationship between diverticulum of gastric fundus and left adrenal gland. Air-filled diverticulum is sometimes a hint for correct diagnosis.

脾臟硬化性血管瘤結節性轉化：兩病例報告

Sclerosing Angiomatoid Nodular Transformation of the Spleen: Two Cases Report

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INTRODUCTION: The sclerosing angiomatoid nodular transformation (SANT) of spleen is a benign vascular mass consisted of angiomatoid nodules and fibrous stromas. Most of these cases are found incidentally in the asymptomatic patient and does not need treatment. It becomes an important clinical issue to differentiate these rare benign splenic nodules from malignant ones on tumor staging and pre-surgical assessment for the patients who have had malignant tumors.

CASE REPORT: We report two cases of SANT in our hospital. Cases included a 45-year old woman, a 65-year old woman who visited our OPD for gallbladder stones and hyperlipidemia. Solitary splenic tumors are initially found in each cases by routine CT scan and ultrasound. Dynamic MR studies followed. The ultrasound studies are inconclusive despite of the large size of these splenic tumors measuring more than 4.5cm in diameter. One of them revealed a peripherally enhanced tumor with a non-enhanced calcified hyper-dense central scar. The other one showed a heterogeneous enhancement with an enhanced central scar on the CT scan. One of the patients who underwent MRI, the lesion was hypo-intense on T1-weighted images and was heterogeneous and predominantly hyper-intense on T2-weighted images.

DISCUSSION: The imaging findings characteristic of SANT have been reported in the radiology. Our cases with SANT show some characteristic imaging features with pathologic correlation, including central scars and heterogeneous enhancement in all phase of the dynamic studies.

小腸之類上皮血管肉瘤在電腦斷層表現類似於胃腸道基質瘤：病例報告
Epithelioid Angiosarcoma of Small Intestine Mimicking GIST in CT Image: A Case Report

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INTRODUCTION: Angiosarcoma is a rare neoplasm, occurring most commonly in the skin and subcutaneous tissues. It constitutes about 1% to 2% of the soft tissue sarcomas. They often occur in the spleen and liver intra-abdominally. Primary angiosarcoma of gastrointestinal tract is very rare. In pathology, epithelioid angiosarcoma (EAS) is a unique morphologic subtype of angiosarcoma. So far, less than twenty cases of EAS origin from the small intestine had been reported in the English literature. We report herein a case of multicentric epithelioid angiosarcoma in the small intestine mimicking GIST in the computed tomography (CT) image. To the best of our knowledge, this type of case had not been reported before.

CASE REPORT: This 69-year-old woman had medical history of coronary artery disease, dyslipidemia, and gastric ulcer. She complained having persistent abdominal pain which aggravated during walking and standing for 2-3 months. She denied fever, vomiting, constipation, or body weight loss. During physical examination, soft abdomen without rebound pain or palpable mass was noted. The laboratory data revealed a hemoglobin (Hb) level of 10.5 mg/dl with mildly decreased mean corpuscular volume (MCV) and a positive fecal occult blood test. The patient's Hb continued to drop, despite repeated blood transfusions. The gastroscopy revealed several ulcers over the antrum and prepyloric region. An ulcer with active blood oozing was noted in the antrum, and injection therapy with diluted epinephrine was done. There is no significant abnormality in the colonoscopy. Ultrasound showed a mass lesion in the pelvic cavity. The abdominal CT scan revealed a homogeneously enhanced solid mass measured 5.5 x 6.2 x 5.4 cm with a central necrosis, and communicating with small bowel lumen at lower abdomen. The fat plane between the mass, uterus and the urinary bladder are not well delineated. No obvious lymph node enlargement is seen. The small bowel series revealed no obvious intraluminal filling defect in the small bowel. Under the impression of GIST, an explorative laparotomy was performed. Two separate lesions located in the terminal ileum and proximal jejunum were found hence segmental resection was done. During surgery, partial cystectomy was also performed due to tumor invasion. Grossly, the tumors are whitish and involving full-thickness of bowel wall. The histopathology of the tumor specimens in the distal ileum and proximal jejunum showed identical histologic pattern which revealed pleomorphic epithelioid neoplastic cells on inflammatory background rich in polymorphonuclear neutrophils (PMNs) and lymphocytes. Many variable-sized vasculatures were noted in high power view. The immunohistochemical stains were positive for vimentin, CD31, and Factor-VIII. On the other hand, AE1/AE3, Cam5.2, 34betaE12, epithelial membrane antigen (EMA), CD34, CD117, S-100, melanin-A, HMB-45, CD20, and CD30 were negative. Positive CD45 and CD3 highlighted the inflammatory lymphocytes. Taken together, the patient was diagnosed as synchronous epithelioid angiosarcoma at the terminal ileum and proximal jejunum with invasion to muscle layer of urinary bladder, and no regional lymph nodes metastasis was noted. Chemotherapy with regimen including cisplatin, ifosfamide, and 5-FU were described for her. Unfortunately, tumor recurrence occurred one month later despite aggressive repeat laparotomy and tumor debulking surgery.

DISCUSSION: Primary malignant tumor in the small intestine is very rare, constituting about 1-1.6% of all gastrointestinal malignancies. The incidence of malignancies in the small intestine are in order of adenocarcinoma, carcinoid, malignant lymphoma, and leiomyosarcoma. EAS most often occurs in the deep soft tissues (usually intramuscular) of the extremities, with the highest incidence in the seventh decade in life. EAS of the small intestine like in our case is extremely rare. In this patient, the necrotic component containing air-fluid level in the central part of the EAS masses is observed, simulating the typical appearance of central necrosis in the GISTs. GISTs occur most commonly in the stomach and small intestine. The typical features of GISTs in the CT are large, hypervascular, enhancing masses on contrast-enhanced CT scan, usually with focal heterogeneous regions result from necrosis, hemorrhage, or cystic degeneration. Exophytic tumor growth is the most common pattern than intramural or intraluminal growth in both benign and malignant GISTs. Other differential diagnosis in this case include lymphoma and metastasis of the small intestine, because all of these lesions could present as large masses in the small intestine with ulceration or cavitation, and extended into the adjacent mesentery. Metastases account for about 50% of all small bowel neoplasms, and it is the most likely diagnosis in the patients with known primary malignancy. On the other hand, the presence of associated lymphadenopathy would favor the diagnosis of lymphoma. (Because no known primary neoplasm or lymphadenopathy was noted in our patient, GIST was suspected initially.) Although the exact pathogenesis of angiosarcoma is unclear, some associated risk factors like occupational exposure to radiation, vinyl chloride, and arsenic are reported. There is no any identifiable risk factor in our patient. According to previous reported cases, the prognosis of EAS is very poor. Most cases progress rapidly, with a median survival of 2 months after diagnosis. Patients with age more than 50 years old and tumor size more than 5 cm would have lower 2-year

survival rates. Complete surgical resection of the primary tumor followed by radiation therapy is usually recommended. Some literatures describe paclitaxel-based chemotherapeutic regimens may improve survival rate. Furthermore, remission had been reported in some cases by combination of adjuvant radiation therapy and bevacizumab, followed by surgery. In pathology, EAS contains vasoformative and solid areas morphologically. Diffuse proliferation of large, round to polygonal, pleomorphic epithelioid cells with abundant, granular cytoplasm constitutes the solid part. Vasoformative area can range from well-formed vessels to slit-like vascular structures. Histopathological evaluation of angiosarcoma is a challenge. Primary or metastatic carcinomas, malignant melanoma, lymphoma, or sarcomas with epithelioid features (particularly GI stromal tumors) need to be excluded carefully. Less aggressive vascular neoplasms should also be included in the differential diagnosis, like epithelioid hemangioendothelioma, containing focal high-grade areas composed of atypical cell and sheeted architecture with most cells in small nests and trabecular pattern. Immunohistochemical staining with expression of endothelial markers (factor VIII related antigen, CD31, CD34) is necessary for definite diagnosis. In conclusion, we report a very rare case of multicentric EAS in the small intestine mimicking GIST in the CT image. GIST, lymphoma, and metastatic neoplasm have to be considered in differential diagnosis in this case, and specific immunohistochemical staining is necessary for definite diagnosis.

小腸套疊導因於肺部肉癌轉移：病例報告

Small Bowel Intussusception due to Metastasized Sarcomatoid Carcinoma of the Lung: A Case Report

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INTRODUCTION: Small bowel intussusception caused bowel obstruction in adult patient is usually related to underlying tumors, which can be primary small intestine tumors, such as lymphoma, gastrointestinal stromal tumors and carcinoid tumors, or the metastasis from lung cancer, renal cell carcinoma, or malignant melanoma. Sarcomatoid carcinoma is an extremely rare tumor characterized by a combination of malignant epithelial and mesenchymal cells.

CASE REPORT: We describe the case of a 64-year-old man with rapid progress sarcomatoid carcinoma of lung associated with multiple jejunal metastases, and caused small bowel intussusception.

DISCUSSION: Sarcomatoid carcinoma is a very rare subtype of lung cancer, rarely metastasizes to small bowel and causes complications. This case emphasizes the importance of recognizing sarcomatoid carcinoma at diagnosis.

PT045-GI

脾臟硬化性血管瘤樣結節性轉化：病例報告

Presentation of SANT on CT and Angiography: A Case Report

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INTRODUCTION: Sclerosing angiomatoid nodular transformation (SANT) is a rare benign tumor of the spleen. Most patients are asymptomatic, that is, most of the tumor is found during laparotomy or during studies for unrelated symptoms. SANT has a unique pathology character and image characters.

CASE REPORT: A 56-year-old man presented to our hospital told that a renal mass was found at the other clinic. CT and angiography later showed a spleen mass, and pathology confirmed the diagnosis of SANT.

DISCUSSION: SANT has a unique pathology character, including multiple angiomatous nodules in a radiating pattern with a central stellate fibrous scar. On contrast-enhanced CT or MRI images, they were heterogeneously hypoenhancing during the arterial and portal venous phases, and most of the lesions have radiating enhancing lines. We share a case that has unique image character.

盲腸腺瘤導致闌尾套疊：病例報告

Appendiceal Intussusception Induced by Cecal Adenocarcinoma in Tubular Adenoma:
A Case Report梁世璇¹ 鄭旭萌¹ 楊斐適^{1,2}Shih-Hsuan Liang¹ She-Meng Cheng¹ Fei-Shih Yang^{1,2}台北馬偕紀念醫院 放射線科¹；元培科技大學 放射技術系²Department of Radiology¹, Mackay Memorial Hospital, Taipei, Taiwan; Department of Radiological Technology², Yuanpei University, Hsinchu, Taiwan

INTRODUCTION: Intussusception of the appendix is rare in worldwide studies and is difficult to recognize before operation.

CASE REPORT: A 58-year-old, previous healthy male complained abnormal bleeding when defecation in past few days. Double contrast colon series and abdominal computed tomography (CT) with and without contrast revealed a 2.5 cm pedunculated, polyp-like lesion adjacent to the ileocecal region, and the appendix was not found. The pathological findings of biopsy tissues of colonoscopy only showed inflammatory change. Appendiceal intussusception was finally recognized during the operation. The pathological report of the specimen from right hemicolectomy revealed a cecal adenocarcinoma in tubular adenoma.

DISCUSSION: Appendiceal intussusception is an interesting variation of the appendiceal diseases that the endoscopist, radiologist, and general surgeon must know and better to identify before operation to avoid possible perforation during biopsy.

PT047-GI

惡性胃部發炎性肌肉纖維母細胞瘤：病例報告

Gastric Inflammatory Myofibroblastic Tumor with Malignant Change: A Case Report

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INTRODUCTION: Introducing a rare case of gastric inflammatory myofibroblastic tumor with malignant change, with image findings mimic GIST.

CASE REPORT: A 54 years old male patient suffered from gradually onset of epigastric tenderness for a few months. CT study revealed a lobulated mass lesion eccentrically protruded from greater curvature side of gastric lower body, toward the serosa. Both shape and contrast medium enhancement pattern of this lesion were almost identical to gastric GIST, so local tumor excision was performed by surgeon. Pathological report revealed tumor cells with bizarre hyperchromatic nuclei, mitotic figure, immunoreactive for desmin, focally immunoreactive for CD34 and smooth muscle actin, indicating inflammatory myofibroblastic tumor with malignant change. Patient has been followed for 4 months without evidence of local tumor recurrence.

DISCUSSION: Inflammatory myofibroblastic tumor is also known as plasma cell granuloma, inflammatory pseudotumor, fibrous histiocytoma, fibroxanthoma, xanthogranuloma, or inflammatory fibrosarcoma. It is a rare tumor arising from inflammatory process, may present low grade malignancy. Disease nature, treatment and outcome are not well established yet.

迴腸大腸淋巴瘤：罕見病例報告
Ileocolic Lymphoma: A Rare Case Report

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INTRODUCTION: Primary colonic lymphomas constitute only 0.4% of all malignant tumors that arise in the colon. Large polypoid masses are the most common type of primary large bowel lymphoma. We present a Ileocolic lymphoma with cecum, ascending colon, appendix, ileum and mesocolon invasion associated with regional, distal necrotic lymphadenopathy mimicking other GI tract invasive cancer.

CASE REPORT: A 81 years old male patient. Abdominal distension & pain off & on for one years, poor intake & body weight loss about 2-3kg/months. The sonography of abdomen showed a 4 cm thick wall lesion at right lower abdomen with gas formation inside. The barium double contrast study of colon showed irregular narrowing and dilatation of terminal ileum, ileocecal valve, cecum and ascending colon with conical appearance of cecum. The CT scan showed a 10.0 x 4.4 x 5.7 cm large soft tissue mass at cecum, terminal ileum with irregular contour, irregularly narrow and aneurysmal dilatation of lumen. Clustered enlarged necrotic regional lymph nodes with paraaortic, mesenteric and falciform ligament lymph nodes were also noted. Differential diagnosis including malignant tumor (colon cancer with terminal ileum involvement, lymphoma), inflammatory bowel disease and sarcoma. Right hemicolectomy and resection of terminal ileum was done. Pathological diagnosis shows diffuse large B cell lymphoma of cecum, ascending colon, appendix, ileum and mesocolon associated with mesocolic lymph nodes involvement.

DISCUSSION: Primary colonic lymphomas constitute only 0.4% of all malignant tumors that arise in the colon. Double-contrast barium studies and CT may reveal polypoid, infiltrative, endoexoenteric cavitory masses opening to the mesentery, mucosal nodules and fold thickening. Focal luminal narrowing, aneurysmal dilatation, or fistula formation in the ulcerative form are occasionally observed. Large polypoid masses are the most common type of primary large bowel lymphoma. Lymphoma is the most frequent malignancy of the small bowel. Small bowel lymphoma can exhibit infiltrative, polypoid, endoexoenteric or mesenteric invasive forms. The image findings of our patient including ileocolic large soft tissue lesion with diffuse local invasion, irregularly narrow and aneurysmal dilatation of lumen, regional and systemic lymphadenopathy, are not typical finding and location of GI lymphoma, associated with more invasive picture mimicking other GI tract malignant neoplasm.

醣化血色素對於糖尿病病人，感染克雷白氏肺炎肝膿瘍之臨床表徵及電腦斷層影像上的影響：藉由半自動化體積測量之評估

Influence of Hemoglobin A1C Levels on the Clinical and CT Characteristics of Klebsiella Pneumoniae Liver Abscesses in patients with Diabetes Mellitus: Assessed by Semiautomated Volumetric Analysis

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PURPOSE: To compare the characteristics of Klebsiella pneumoniae liver abscesses (KPLA) in diabetic patients with different levels of glycemic control.

MATERIALS AND METHODS: The institutional review board approved this retrospective study. A total of 221 patients with KPLA were included. Clinical features of KPLA were compared. We further divided the 120 diabetic patients with KPLA into three subgroups based on hemoglobin A1C (HbA1C) concentration (good, HbA1C≤7.0%; suboptimal, 7.0% < HbA1C ≤ 9.0%; poor, HbA1C > 9.0%). In this study, we used a semiautomated quantitative method to assess the gas and total abscess volumes in KPLA. Statistical analysis was performed with the chi-squared test and one-way analysis of variance.

RESULTS: The mortality rate did not significantly differ between nondiabetic and diabetic groups. However, CT and quantitative analyses found that patients in the group with poor glycemic control had a significantly higher incidence of gas-formation and hepatic vein thrombosis and a higher gas-to-abscess volume ratio than did patients with suboptimal and good glycemic control (P < 0.05). In 33 KPLA patients with metastatic infection, 72.7% (n=24) showed CT evidence of hepatic vein thrombosis.

CONCLUSION: Diabetic patients with a high HbA1C concentration (> 9.0%) have a tendency to have hepatic vein thrombosis, gas formation, and metastatic infection complications associated with KPLA.

以 ARFI 彈性超音波評估肝移植後 C 肝復發之肝纖維變化及臨床預後

The Acoustic Radiation Force Impulse Elastography in Post Transplant Recurrent Hepatitis C of Living Donor Liver Transplantation

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PURPOSE: The aim of this study is to evaluate the efficacy of acoustic radiation force impulse (ARFI) elastography in post-transplant HCV recurrence for liver fibrosis change and the disease progression.

METHOD AND MATERIAL: From Aug. 2009 to Aug. 2013, 105 patients of chronic HCV for adult living donor liver transplantation enrolled and received ARFI elastography (ACUSON S2000, Siemens) for post liver transplant (PLT) liver stiffness measurement (LSM). The LSM was calculated as median shear wave velocity (SWV) (m/s) from 5-10 measurements at same site. The SWV was analyzed using receive-operating characteristic curve (ROC) for cut-off values of fibrosis stages by Metavir scores (F0-F4). Clinical states after treatment also evaluated. Paired sample t-test was performed for evaluating significance of the disease prognosis.

RESULTS: 69 patients received LDLT with underline HCV were completely evaluated in the study. Patients were divided into G (1) (n=34), with PLT normal LFT and G (2) (n=35) with PLT abnormal LFT. In G (1) the ARFI was 1.13±0.32m/s and G (2) was 1.70 ± 0.55m/s. In G (2) after medical treatment, improvement was found in 10 patients LFT and the ARFI was improved to 1.21 ± 0.55m/s. The other 25 patients with deterioration of LFT and increase of ARFI SWV to 2.03 ± 0.76m/s. The sensitivity and specificity were analyzed using ROC curve with well correlation between ARFI and LB histological fibrosis grading (p < 0.0001). ARFI SWV > 1.88m/s is the critical point for irreversible fibrotic change.

CONCLUSION: For the PLT HCV recurrence, the sensitivity of liver fibrosis is highly reflection to ARFI and it is essential for future follow up and instead of sequential biopsy.

非相干性運動擴散加權成像在肝臟纖維化診斷的初步結果 Imaging Liver Fibrosis Using Intravoxel Incoherent Motion: Preliminary Results

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PURPOSE: Liver biopsy is the gold standards for preoperative staging of liver fibrosis but has the drawback of small specimen and post-biopsy bleeding. Here, we investigate the relationship between MRI parameters and liver fibrosis stages.

MATERIALS AND METHODS: This prospective study was approved by the local IRB. Patients underwent hepatectomy at our institute were enrolled. MRI was performed within 1 week prior to hepatectomy on a 3T scanner (Verio, Siemens) with 10 b-values (0, 5, 15, 25, 35, 50, 100, 200, 400 and 800s/mm²). Data are fitted to the biexponential decay model and parameters including Dfast, Dslow and perfusion fraction were extracted. Liver specimens were staged as fibrosis 1 to 6 (F1-F6).

RESULTS: Twenty five cases (8 female, 17 male; aged 62.6 ± 11.9 years) were enrolled. Five were staged as F1-2 and 20 as F3-6. The perfusion fraction is significantly higher in F1-2 as compared with those of F3-6 (p=0.006). In general, patients with F3-6 showed a decrease in the value of slow ADC component (diffusion component) and an increase in the fast ADC component (perfusion component) as compared with those of F1-2, although not reaching statistical significance (p > 0.05).

CONCLUSION: This study shows that perfusion fraction is significantly reduced in the F3-6 patients as compared with those in F1-2 whereas fast and slow ADC values are not significantly difference between groups. Having the limitation of small case number and poor histological correlation, further investigation is still need.

PT052-HP

在擴散權重影像和表觀擴散係數中找出理想的 b 值區分良性和惡性肝腫瘤：初步報告 Optimization of b Value Combination in Diffusion Weighted Imaging and Apparent Diffusion Coefficient Facilitating in Differentiate Benign and Malignant Hepatic Tumors: A Preliminary Report

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PURPOSE: To evaluate the apparent diffusion coefficient (ADC) of hepatic tumors in different b value setting and to find the proper b value for differentiating benign and malignant tumors.

MATERIALS AND METHODS: A total of 30 consecutive patients with 34 hepatic nodules, including 22 benign nodules (1 focal nodular hyperplasia, 9 hemangiomas, and 22 cysts), 12 malignant nodules (10 hepatocellular carcinoma, 2 cholangiocarcinoma) were included. All patients underwent conventional Gadolinium enhanced dynamic MRI (Phillips 1.5T) and diffusion weighted image (DWI) using four different b values (b=0, 100, 500, 1000 s/mm²). The ADC was calculated according to seven different b value combinations (b1= 0, 100; b2= 0, 500; b3= 0, 1000; b4= 0, 100, 500; b5= 0, 500, 1000; b6= 0, 100, 1000, b7= 0, 100, 500, 1000 s/mm²). All patients underwent one-year follow up or pathological assessment for confirmation of the diagnosis. We calculated the mean ADC value of each lesion in different ADC maps. T-test was used to evaluate the statistic differences; p < 0.05 indicated statistical significance. Receiver operating characteristic curve analysis was used to optimize the proper b value which has better accuracy in differentiating benign and malignant lesions.

RESULTS: The ADC values for malignant nodules were significantly lower than benign nodules in all different b value combinations (p < 0.05). The b value combination, b5, has higher accuracy in differentiating benign and malignant lesions (cut off point: 1697.5 mm²/s, sensitivity: 100%, specificity: 90.9%, accuracy: 90%).

CONCLUSION: The malignant nodules have lower mean ADC values. The proper b value for differentiating benign and malignant lesion is b=0, 500, 1000/mm², which has higher accuracy.

擴散權重影像在門靜脈腫瘤栓塞之應用

Diffusion-weighted Imaging for the Diagnosis of Tumor Thrombosis in the Portal Veins

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PURPOSE: Distinguishing bland from tumor thrombus within the portal veins has important implications for tumor staging, treatment and prognosis. Thrombus conspicuity is potentially enhanced by the application of diffusion gradients which suppresses blood motion. Previous reports have shown that hepatocellular carcinoma (HCC), metastatic disease and renal cell carcinoma (RCC) demonstrate restricted diffusion. Thus we hypothesize that tumor thrombus will also demonstrate restricted diffusion and enable its detection.

METHODS: We retrospectively identified 3 patients with portal thrombosis diagnosed at MRI who received DWI as well as conventional contrast enhanced MRI at 1.5 T. Patients were evaluated at 1.5 T with axial SSEPI DWI using $b=0-400$ sec/mm², navigator or free-breathing techniques. Tumor thrombus was diagnosed based on restricted diffusion. This was defined as signal intensity higher than the adjacent organ of interest (liver) with visually decreased ADC. Exponential ADC was also measured in each case. The reference standard for diagnosing tumor thrombus was histologic confirmed.

RESULTS: Three tumor thrombi were both diagnosed at the image and pathology. The tumor thrombus all with underlying HCCs based on radiologist interpretations and correlative laboratory values. All the three tumor thrombi show signal intensity higher than the liver. The mean exponential ADC (x mm²/sec) for tumor thrombus was 0.578 ± 0.012 .

CONCLUSION: Data on the utility of DWI in tumor thrombus in the abdomen is extremely limited. Our results demonstrate that restricted diffusion has high positive predictive value for tumor. Our preliminary results demonstrate promise for the potential utility of DWI in detecting and predicting tumor thrombus both on a qualitative and quantitative basis.

PT054-HP

超音波導引下經皮微波滅除術治療肝臟腫瘤

Percutaneous Ultrasound-guided Microwave Ablation of Liver Tumors

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PURPOSE: To analyze the efficacy, side effects, and complications of percutaneous microwave ablation performed under ultrasound guidance in 57 patients with 64 liver tumors.

MATERIALS AND METHODS: From January 2013 to November 2013, 57 patients (41 men and 16 women) with 64 liver tumors underwent US-guided percutaneous microwave ablation. Tumor diameters ranged from 0.9 to 6.5 cm. The efficacy of microwave ablation was evaluated using contrast-enhanced dynamic computed tomography 1 month after treatment and then every 3 months. Complete necrosis was defined as lack of contrast enhancement of the treated region.

RESULTS: There was complete necrosis in 50 tumors. Complete necrosis was seen in all 18 tumors (100%) with diameters of 3.0 cm or less, 20 of 30 tumors (67%) with diameters of 3.1–5.0 cm. The major complications after treatment were abscess (two patients) and biloma (one patient).

CONCLUSION: Percutaneous ultrasound-guided microwave ablation is effective and successful in the treatment of liver tumors of 3 cm or less and satisfactory for tumors of 3–5 cm. The rate of serious complications after microwave ablation is low.

腹部鈍器傷導致單一膽囊破裂：病例報告

Isolated Gallbladder Perforation Due to Blunt Abdominal Trauma: A Case Report

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INTRODUCTION: Gallbladder injury is infrequent, and occurs in about 2% of cases of blunt abdominal trauma, with motor vehicle accidents being the most common cause. Isolated gallbladder injury (including gallbladder perforation) is even rarer. The symptom is vague and may lead to delayed diagnosis. We present a case of gallbladder perforation after blunt abdominal trauma, which is diagnosed by computed tomography (CT) and paracentesis.

CASE REPORT: A 39 year-old male patient suffered from a falling down accident from a height of 3m. Laceration of left facial region and right upper quadrant pain were identified. Blood analysis showed WBC=14380/μL, GPT=102U/L, total bilirubin=3.4mg/dl, direct bilirubin=1.94mg/dl, and C reactive protein=7.98mg/dl. CT of facial bone showed fractures of nasal bone and left maxilla. Contrast-enhanced CT of the abdomen revealed a round and mass-like lesion with a diameter of 4cm and an attenuation value of 70H.U. inside the gallbladder. Ascites with a density of 5H.U. was also seen. No imaging evidence of other internal organ injury was found.

Due to the patient's persistent right upper quadrant pain, sono-guided paracentesis of 50ml of dark green fluid was performed, which was confirmed to be bile ascites with a total bilirubin of 40mg/dl and direct bilirubin of 26mg/dl. Therefore, the diagnosis of gallbladder hematoma and perforation was made.

Emergent laparotomy uncovered a 2cm perforation hole at the anterior wall of the gallbladder; 1500c.c. turbid ascites was removed. No other intraabdominal injury was noted. Cholecystectomy was performed. The patient was discharged with an uneventful course on the 10th day post operation.

DISCUSSION: Isolated gallbladder perforation is rare after blunt abdominal trauma. Correct diagnosis with CT, and if necessary, paracentesis can prompt emergent operation to reduce the morbidity and mortality of the patient.

PT056-HP

使用超音波觀察游移脾的位移性質和灌注狀態：病例報告

Ultrasonography for the Migratory Nature and Perfusion Status of a Wandering Spleen:

A Case Report

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INTRODUCTION: Wandering spleen is a rare condition resulting from laxity or absence of the suspensory ligaments of the spleen. The hypermobile spleen can “wander” in variable areas of the abdominal cavity. It can be asymptomatic, but splenic torsion is a potential serious complication clinically.

CASE REPORT: Although splenic hypermobility is the pathognomonic feature of a wandering spleen, it is rarely revealed by imaging in the subclinical stage. We report an asymptomatic patient with a subclinical wandering spleen who had incidental sonographic findings of splenomegaly.

DISCUSSION: Gray scale and color Doppler sonography in the right decubitus position can easily show the migratory nature and perfusion status of a wandering spleen in real time. The literature is briefly reviewed.

影像特徵類似惡性腫瘤之硬化性肝臟血管瘤：病例報告

Hepatic Sclerosed Hemangioma Mimicking Hepatic Malignancy: A Case Report

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INTRODUCTION: Hemangioma is one of the most frequently encountered benign hepatic neoplasms which can develop secondary degeneration. Hemangiomas that undergo degeneration and fibrous replacement are called sclerosed, thrombosed, or hyalinized hemangiomas.

CASE REPORT: A 55-year-old male patient underwent contrast-enhanced computed tomography (CT) for multiple hepatic tumors detected on sonography. Tumor markers including carcinoembryonic Antigen (CEA), alpha-fetoprotein and CA19-9 were within normal limits. A 4.5cm heterogeneous hypodense hepatic mass is noted in segment VII, with mild and heterogeneous enhancement. Co-existence of hepatic hemangiomas with classic imaging features are also noted. Subsequent magnetic resonance (MR) imaging shows a heterogeneous hypointense mass in T2-weighted imaging. Gadolinium-enhanced dynamic images show mild, irregular enhancement mainly in periphery of the mass. Hepatocellular carcinoma (HCC) or cholangiocarcinoma with atypical imaging appearance was considered. He underwent a right lobectomy of liver, which disclosed a hepatic sclerosed hemangioma.

DISCUSSION: It has been suggested that prospective diagnosis of sclerosed hemangioma is difficult. Imaging features suggestive of a sclerosed hemangioma may include geographic morphology, capsular retraction, and decrease in size over time, and loss of previously seen regions of enhancement. Additional features include rim enhancement, and nodular regions of intense enhancement as seen in typical hemangioma. It is important to be familiar with the imaging characteristics, and a hepatic sclerosed hemangioma can be diagnosed with biopsy before more complex intervention is undertaken.

PT058-HP

肝臟的未分化胚胎性肉瘤發生於一位老年女性：病例報告

Undifferentiated Embryonal Sarcoma of the Liver in an Old Woman: A Case Report

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INTRODUCTION: Undifferentiated embryonal sarcoma (UES) is a rare, highly malignant neoplasm of the liver that occurs predominantly in children. It has imaging characteristics that may resemble those of cystic lesions. We present a case of undifferentiated embryonal sarcoma of the liver in an old woman.

CASE REPORT: A 70-year-old female visited our hospital due to intermittent fever. Laboratory tests revealed normal WBC but mildly elevated C-reactive protein. Abdominal ultrasound showed a huge complex cystic mass in Segment VI/VII of liver, which was suspected abscess. A contrast-enhanced CT of abdomen disclosed a low-density mass with thick and irregular septum. The solid part of the mass showed mild, and minimally progressive enhancement in dynamic study. No obvious rim enhancement of the mass was observed. Hepatic neoplasm was considered in this CT study, and undifferentiated embryonal sarcoma was confirmed at liver segmentectomy.

DISCUSSION: UES has been theorized that this cystic appearance is related to the high water content of the abundant myxoid stroma. This cystic appearance may lead to an incorrect differential diagnosis such as hydatid cyst or amebic abscess. The use of delayed phase contrast-enhanced CT and MR imaging also is useful because these techniques demonstrate tumoral enhancement and help exclude purely cystic lesions from the differential diagnosis.

成人未分化性胚胎型肝肉瘤：病例報告與文獻回顧

Undifferentiated Embryonal Sarcoma of the Liver in an Adult: A Case Report and Literature Review

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INTRODUCTION: Undifferentiated embryonal sarcoma of the liver (UESL) occurs mainly in pediatric age group between 6 and 10 years old and belongs to a rare disease in adulthood. We presented a case of adult UESL.

CASE REPORT: A female aged 59 was hospitalized owing to intermittent abdominal pain in the right upper quadrant. The computed tomography (CT) showed a large water attenuation lesion with multi-septum formation and peripheral soft tissue component. A cystic component revealed fluid-fluid level on magnetic resonance imaging (MRI), which may be caused by hemorrhage. On contrast-enhanced CT and MRI, the solid portion of the mass demonstrated heterogeneous enhancement. The differential diagnoses include cystic metastasis and biliary cystadenocarcinoma. The patient underwent extended right lobectomy and cholecystectomy. The microscopic examination revealed highly atypical spindle tumor cells arranged in myxoid stroma. Immunohistochemical staining characterized the tumor as positive for vimentin and alpha-antitrypsin, which was compatible with UESL.

We applied chemotherapy with doxorubicin, ifosfomide and mesna to the patient. However, multiple metastases were found in the liver by CT four months later. Hence, she received radiofrequency ablation and continued follow up.

DISCUSSION: The UESL is a rare disease in adults. Patients may have unspecific symptoms such as abdominal pain or weight loss. The tumor markers are often unremarkable. However, when we observe a large hepatic lesion with multi-cystic appearance on CT or MR, UESL should be taken into account.

PT060-HP

發生於肝硬化病患之單一肝臟局部結節性增生於術後兩年復發：病例報告

Solitary Atypical FNH in Cirrhotic Liver Recurred Two Years Later after Resection: A Case Report

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INTRODUCTION: We report a rare case of atypical FNH occurred in cirrhotic liver and recurred two years later after resection.

CASE REPORT: A 52 years old male was a case of chronic B-hepatitis under regular followup in our hospital since 2010. Liver cirrhosis and splenomegaly were impressed by regular sonographic followup. In December, 2010, a 1.9cm hypoechoic hepatic nodule was found by sonography and was suspected to be a HCC. Abdominal MRI was performed and showed a hypervascular hepatic nodule and HCC could not be R/O. The lesion was resected due to patient's unwillingness to accept biopsy and pathology showed FNH. Then the patient received regular sonographic followup and two small new lesions were found in March, 2013. MRI found two small hypervascular tumors with imaging features not typical for HCC, FNH or else. Second operation was performed for same reason and pathology again revealed FNH.

DISCUSSION: Focal nodular hyperplasia (FNH) is usually a stable lesion that does not enlarge when studied for long periods of time; recurrence after resection is rare. Furthermore, FNH that occurs in cirrhotic liver is rare also.

肝內門靜脈-肝靜脈分流：病例報告
Intrahepatic Porto-systemic Shunt: A Case Report

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INTRODUCTION: Intrahepatic porto-systemic venous shunts (IPSVS) are rare vascular abnormalities that frequently lead to hepatic encephalopathy. We present a patient with an already mentioned vascular lesion in the liver and proved to be IPSVS by color Doppler.

CASE REPORT: A 82 year-old woman with a history of non-B, non-C liver cirrhosis, was brought to our emergency department because of abdominal fullness and pain in recent days. During the ER admission, abdominal sonography disclosed a 3cm anechoic lesion over S7 of the liver and connection between both hepatic vein and portal vein by color Doppler study. The diagnosis of porto-systemic shunt from right portal vein to right hepatic vein was confirmed. The lab data showed that ammonia level is 137 ug/dl. Total/direct bilirubin level is 8.3/4.3 mg/dl, with disturbed mental status. Hepatoencephalopathy was impressed. The waveform of the hepatic vein measured in this patient was shows a monophasic and the portal vein shows a monophasic waveform. The wave form in the shunt demonstrated both of them.

DISCUSSION: The condition of the IPSVS is rare. Since the lesion is anechoic under 2D sonography, it may be missed as a simple liver cyst or aneurysm if the connection between both hepatic and portal vein is not seen. With the proper use of color Doppler study, the connection between both vessels can be observed. Since an IPSVS may cause hepatic encephalopathy, the correct radiological diagnosis and proper treatment of this unusual abnormality is important.

PT062-HP

肝結核：病例報告
Radiologic Appearance of Hepatic Tuberculosis: A Case Report

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INTRODUCTION: Extra-pulmonary tuberculosis involving liver, without active pulmonary or military tuberculosis, is relatively rare. These lesions are almost indistinguishable from many other focal hepatic lesions, such as hepatocellular carcinoma, metastases and Hodgkin's disease, so tissue proof is necessary for diagnosis. The case shown below described clinical, radiological, and pathological features.

CASE REPORT: A 59-year-old female, with a past history of hypertension, suffered from epigastric pain and body weight loss 5kg for 4 months. She went to Kaohsiung medical hospital where normal thyroid function was unremarkable and abdominal sonography revealed a hypoechoic tumor. The patient came to Cathay General Hospital (CGH) for further management. No abnormality was seen on regular blood exam nor elevated tumor markers. Viral markers for hepatitis B and hepatitis C were negative. Subsequent CT scan showed a large mild peripheral-enhanced tumor at hepatic hilum, scattered bilateral 1-2 cm hepatic tumors at both lobes and marked lymphadenopathy at hepatic hilum, mediastinum, and left axilla. Under the impression of tuberculosis infiltration or malignancy, the patient then received hepatic and axillary needle biopsy and it proved a caveating granulomatous inflammatory tissue. After anti-tuberculosis agent, follow-up CT 3 months later noted significant regression of the infiltrative hepatic lesion with residual mass in caudate lobe.

DISCUSSION: Hepatosplenic tuberculosis generally manifests in a micronodular (miliary) or macronodular (tuberculoma, larger than 2 mm in diameter) form. The former usually associates with miliary pulmonary tuberculosis; the differential diagnosis includes metastases, fungal infection, sarcoidosis, and lymphoma. The macronodular form is rare and can be mistaken for metastases, primary malignant tumor, or pyogenic abscess. Since delayed treatment of tuberculosis is associated with severe morbidity, a greater awareness of this rare clinical entity should be considered as to prevent needless surgical intervention. Thus pathological examination, a polymerase chain reaction (PCR) assay or culture specimen is necessary for diagnosis.

伴隨導管定向溶栓治療肝膽和選擇性腸系膜上動脈灌注在一個年輕女子的近期門靜脈血栓形成
Concomitant Catheter-directed Transhepatic Thrombolysis and Selective Superior Mesenteric Artery Infusion in a Young Woman with Recent Portal Vein Thrombosis

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INTRODUCTION: Patients with portal vein thrombosis (PVT) may be asymptomatic but the consequences can be severe. Early detection and treatment is crucial to avoid the severe consequences. Catheter-directed thrombolysis (CDT) with anticoagulation played an important role in PVT in recent years. We present a case with concomitant catheter-directed transhepatic thrombolysis and selective superior mesenteric artery infusion with urokinase and heparin.

CASE REPORT: A 22-year-old woman had intermittent abdominal dull pain for 3 weeks. Computed tomography revealed PVT. We performed concomitant catheter-directed transhepatic thrombolysis and selective superior mesenteric artery infusion with urokinase and heparin. After 4-days thrombolysis treatment, the symptoms dissolved and the follow-up ultrasound three months after discharge revealed patent portal vein without thrombosis.

DISCUSSION: Urokinase and heparin are widely used in thrombolysis of peripheral and central vascular thrombosis. Thrombolysis for PVT can be performed via trans-arterial or transhepatic routes. Combination of these two methods costs more time but offers ideal result. Awareness of the possible bleeding complication during infusion of the thrombolytic agents is important.

PT064-HP

肝內膽汁瘤：一個罕見並的肝癌栓塞並發症
Intrahepatic Biloma: A Rare Complication of TACE

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INTRODUCTION: Intrahepatic biloma is one of the rare complications occurring after transcatheter arterial chemoembolization (TACE). Biloma after TACE may result from the development of peripheral bile duct necrosis caused by microvascular damage of the peribiliary capillary plexus, and intrahepatic ductal stenosis.

CASE REPORT: A 73 year old male Taiwanese is a chronic hepatitis C patient who has previously been treated for HCC. Follow up sonography found suspicious liver nodules, and subsequent dynamic MRI with gadolinium revealed 4.5cm S7/8, 0.8cm S8, and 1.6cm S2 tumors with typical features for HCC. TACE with 30mg doxorubicin, 4mg mitomycin, and gelfoam powder was performed for the right lobe, and only gelfoam powder was used for the left lobe due to presence of distal branches that supply gastric fundus. Persistent abdominal pain was noted after TACE, and follow up sonography was performed which found progressive echogenic collection around the portal triad in hepatic hilum. CT confirmed the presence of a large intrahepatic biloma and a pigtail drainage catheter was inserted under sonographic guidance. Patient's symptoms improved temporarily for about a week and the abdominal pain returned, and sonography showed recurrence of biloma. Drain tube was left in place to continue drainage. About two weeks later patient complained of abdominal fullness, right upper quadrant, and developed a fever. Sonography then showed persistent biloma, and a S7 gas-containing lesion consistent with abscess. After discussion with patient and family, surgery was performed and the abscess and biloma were both successfully drained.

DISCUSSION AND CONCLUSION: Intrahepatic biloma is a rare complication of TACE which may be difficult to treat conservatively as demonstrated in our case.

原發性肝血管肉瘤：病例報告
Primary Hepatic Angiosarcoma: A Case Report

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INTRODUCTION: Primary hepatic angiosarcoma is a very rare tumor that usually presents with nonspecific symptoms in elderly men, making it difficult to diagnose in the early stage.

CASE REPORT: We report a 75-year-old man diagnosed as urothelial cell carcinoma of ureter with stable condition. Abdominal computed tomography revealed a lobulated mild enhancing low-density lesion at the right lobe liver. Hepatic metastases or hepatocellular carcinoma was suspected. Ultrasound-guided biopsy was performed and the final histopathologic diagnosis was hepatic angiosarcoma.

CONCLUSION: Primary hepatic angiosarcoma is a rare mesenchymal tumor of the liver that usually presents with nonspecific symptoms in elderly man. Pre-operative diagnosis is usually difficult. We discuss the clinical feature and imaging of hepatic angiosarcoma.

肝臟惡性血管肉瘤：病例報告
Hepatic Angiosarcoma: A Case Report

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INTRODUCTION: We are to report one case of hepatic angiosarcoma, which was confirmed by pathology examination of surgical biopsy by laparoscopy. Review of literature and discussion were focused on image presentation of angiosarcoma and differential diagnosis.

CASE REPORT: One 63-year-old male patient had hypoechoic lesions within liver parenchyma initially. However, first CT of abdomen did not reveal definite lesion. Follow-up sonography found persistent hypoechoic lesion, while follow-up liver tri-phasic CT showed hypervascular lesions with arterial and portal venous enhancement. Two repetition of percutaneous biopsy did not yield conclusive result. Pathology examination of surgical biopsy by laparoscopy confirmed hepatic angiosarcoma. The image presentation consisted of disseminated micronodular hypervascular lesions and large hypervascular lesions with cystic component or necrotic part.

DISCUSSION: The imaging presentation of angiosarcoma may resemble hemangioma, epithelioid hemangioendothelioma, hepatocellular carcinoma and metastatic hypervascular tumors. Differential diagnosis relies on pattern of enhancement and morphology. Percutaneous and surgical biopsy have low yielding rate. Suspicion on clinical course, laboratory data and image presentation helps to make the diagnosis.

腎臟血管肌肉脂肪瘤之栓塞 Embolization of Renal Angiomyolipoma

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PURPOSE: Renal Angiomyolipomas (AMLs) are the common benign mesenchymal tumors of kidney and composed of blood vessels, smooth muscle, and mature adipose tissue. Although AMLs regarded as benign, they may gradually growth up and become to have spontaneous rupture and hemorrhage complications. Transarterial embolization (TAE) is one of the palliative or therapeutic treatments. Some authors classified AMLs to predict their risk of rupture by counting on their angiographic component to three grades. Our purpose is to evaluate the reductive rate of TAE and their correlation with the angiographic grading.

MATERIALS AND METHODS: From May 2005 to Feb 2012, fourteen cases with AML(s), was performed by TAE(s) were evaluated retrospectively. They are 3 male and 11 female, with average age 35.1years old. The following parameters were collected: pre-TAE CT tumor volume, pre-TAE CT date, TAE date, TAE materials used, post-TAE CT tumor volume, post-TAE CT date.

RESULTS: Total 21 trials of TAE had been done with two of patients having bilateral and unilateral AMLs TAE for three times. The overall and 1st time size reductive rates are 23.8% and 30.4%.

CONCLUSION: TAE is considered to be an effective palliative or therapeutic treatment for AMLs.

PT068-GU

台灣男性前列腺動脈之分佈及吻合：初步結果 The Distribution and Anastomosis of Prostatic Artery in Taiwanese: A Preliminary Result

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PURPOSE: Symptomatic benign prostatic hyperplasia (BPH) typically occurs in the sixth and seventh decades, and the most frequent obstructive urinary symptoms are hesitancy, decreased urinary stream, sensation of incomplete emptying, nocturia, frequency, and urgency. Various medications can decrease the severity of the symptoms secondary to BPH, but prostatectomy is still considered to be the traditional method of management. However, minimal invasive treatment is going to be a trend, and prostate artery embolization (PAE) might be a potential alternative treatment without alternation of sexual function. To identify the distribution of anatomy and imaging findings of the prostatic arteries (PAs) is becoming a key factor for successful PAE. Our purpose is to identify prostatic arteries (PAs) by multidetector computed tomography (MDCT).

MATERIALS AND METHODS: A retrospective analysis is performed to include the patients with male gender and age from 20 to 70 year old receiving multidetector computed tomography (Philips, Brilliance 64-slice) angiography with arterial phase over pelvic region. The data are collected from 2013/9 to 2013/12 and by using workstation (Extended BrillianceTM Workspace), every cases are being reconstructed under the technique of maximum intensity projection (MIP). All the origin, distribution and anastomosis of bilateral prostatic arteries (PAs) are recorded.

RESULTS: The common origins of prostatic arteries (PAs) are arising from internal pudendal artery, gluteal-pudendal trunk, obturator artery and inferior gluteal artery. And anastomosis is frequently occurred. The percentage and the anastomosis will be presented.

CONCLUSION: PAs have highly variable origins between left and right sides and also between patients. They are most frequently arising from the internal pudendal artery. Knowing the anastomosis may reduce the complication during PAE.

馬蹄腎的超音波表徵 Sonographic Features of Horseshoe Kidney

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PURPOSE: To evaluate the sonographic characteristics of the horseshoe kidney.

MATERIALS AND METHODS: From January 2005 through October 2013, thirty-nine consecutive patients with Horseshoe kidney had been proven by CT scan. All cases received sonography examination before or after CT scan. Retrospect analysis of the sonographic findings of those patients by two experienced radiologist.

RESULTS: Reliably sonographic features of horseshoe kidney included Isthmus in 34 cases (87%), tapering lower end in 20 cases (51%), bent contour and overlapping vertebra in 28 cases (72%) but malrotation and altered axis of kidney are difficult to assess by sonography. There are 7 cases (18%) were missed by initial sonography just at before or after CT scan.

CONCLUSION: Searching isthmus especially longitudinal view, tapering lower end of kidney, bent contour and overlapping vertebra are important features for diagnosis of horse-shoe kidney in ultrasound study

腎臟囊腫病灶之超音波特性及處置 Characterization and Management of Various Renal Cystic Lesions by Sonographic Features

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INTRODUCTION: Renal cysts are common incidental findings in clinical practice. Most of the renal cysts on medical imaging are benign simple cysts. However, some renal cysts may be complicated with hemorrhage, infection or associated with calcification, in these instances, they can be difficult to be distinguished from cystic renal tumors, such as cystic renal cell carcinoma, multiloculated cystic nephroma, mixed epithelial and stromal tumor. The Bosniak classification is widely used to categorize cystic renal lesions. However, the Bosniak classification is used for classification of cystic renal lesions are being discovered at Computed Tomography (CT). Ultrasonography (US) and color Doppler imaging are the most frequently used imaging technique for abdominal survey or long-term follow-up with its noninvasiveness, low costs and no need of intravenous contrast medium injection.

CONCLUSION: In this pictorial essay, we review US features of various cystic lesions of the kidney and to propose an algorithm of US feature-oriented approach to renal cystic lesions.

以血管與腫瘤的解剖三維影像重建圖促進精確的術前計劃

Three-dimensional Reconstruction of Vascular-tumor Anatomy to Facilitate Accurate Preoperative Planning

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Department of Radiology, China Medical University Hospital, Taichung, Taiwan; China Medical University,
Taichung, Taiwan**PURPOSE:** A thorough understanding of vascular tumor anatomy is essential before surgery. The aim was to evaluate the efficiency of new three-dimensional (3D) reconstruction technique of vascular-tumor anatomy in preoperative planning.**MATERIAL AND METHODS:** We reconstructed the three-dimensional (3D) CT images for surgeons preoperatively. The technique was to fuse 2 major anatomic aspects: surface-rendered semitransparent tumor with extra- and intrarenal arterial anatomy for renal tumors and surface-rendered semitransparent tumor with adjacent vital vessels and the possible feeding arteries for extrarenal tumor. Seven patients with a central small intrarenal tumor, 2 patients with a huge renal tumor and one with a big retroperitoneal tumor underwent 3D reconstruction. The demographics data, tumor size, operative method, pathologic result, hospital stay and complication were recorded.**RESULT:** One patient was excluded due to brain metastasis and nephrectomy was not performed. The mean of patients' age was 50 yr (range: 36-68 yr), and tumor size was 9.3 cm (range: 2.6-20 cm). Two patients received radical nephrectomy; one is because patient's request and one is for huge mucinous cystadenocarcinoma of kidney after unroofing. Six patients received success partial nephrectomy and one underwent en bloc tumor resection with negative surgical margins and without complications. The average hospital stay is 6.75 days.**CONCLUSION:** 3D image navigation precisely identified tumor specific arterial branches, thus facilitating accurate preoperative planning.

PT072-GU

腹膜腔外轉移性腫瘤的經皮冷凍治療：五病例經驗

Percutaneous Cryoablation for Extraperitoneal Metastatic Tumors: Initial Experience with Five Patients

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PURPOSE: To evaluate the technical feasibility, safety and short-term outcomes of cryoablation in extraperitoneal metastatic tumors.**METHOD:** We retrospectively review the patients with oligometastatic (number = < 3, size = < 3 cm) extraperitoneal tumors treated with cryoablation in Taipei Veterans General Hospital from 2010 to 2013. The tumor characteristics, adapted techniques, complication, hospital days and the local tumor control rate were recorded.**RESULT:** Total 5 patients were recruited in this study, including right obturator muscle (cervical adenosquamous carcinoma metastatic), left paraaortic (two renal cell carcinoma, RCC; one ovarian cancer), left buttock (uterine leiomyosarcoma). The mean age was 55.8 years old (30 to 87 years). During the procedure, special techniques were used including hydrodissection, balloon displacement, and preprocedure double J insertion in ureter. There was no major complication and one minor complication (hematoma). The hospital stay ranged from 2 to 5 days (mean 3.4 days). The follow up period was 9 to 18 months (mean 13 months). All 5 patients achieved successful local control. One of our patients (uterine leiomyosarcoma) developed lung metastasis 9 months after the procedure.**CONCLUSION:** Cryoablation is an effective treatment for local tumor control in selected patient with oligometastasis.

源自腎上皮樣血管平滑肌脂肪瘤個案中膽固醇壞死的聲音陰影 Acoustic Shadowing from Cholesterol Necrosis in a Case of Renal Epithelioid Angiomyolipoma

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INTRODUCTION: Acoustic shadowing is common in ultrasound images and occurs when the energy of transmitted sound is decreased by reflection and/or absorption.

CASE REPORT: Examples of shadowing structures include calcified plaque, bone, and stones, which usually produce clean shadowing. Sometimes the acoustic shadowing may be dirty and sometimes it may occur just behind highly attenuating soft tissues with multiple internal interfaces, such as the mixture of sebum and hair in ovarian teratomas.

DISCUSSION: Herein, we report a rare condition with acoustic shadowing, which occurred behind extensive cholesterol necrosis in an epithelioid angiomyolipoma of kidney. We think that the acoustic shadowing in the present case is the result of the accumulation of cholesterol crystals with multiple interfaces.

PT074-GU

攝護腺副神經節瘤 Extra-adrenal Paranglioma of Prostate

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INTRODUCTION: Extra-adrenal pheochromocytomas are catecholamine-producing tumors that may arise from any site where chromaffin tissue is present. Of these locations, prostatic paragangliomas are extremely rare. Clinical presentations are not specific and classic triad of symptoms (i.e., episodic headache, sweating, and tachycardia) are not common.

CASE REPORT: We report an unusual case of a prostatic paraganglioma diagnosed with CT-guided biopsy, and successfully removed by surgical intervention.

DISCUSSION: In conclusion, this case illustrates a rare condition of prostatic paraganglioma. As yet, the prognosis of prostatic paraganglioma has not been clearly defined owing to the absence of reliable parameters and the small number of reported cases. Long-term follow-up with annual determinations of catecholamine production, cross-sectional CT imaging for anatomical evaluation, and iodine-123 metaiodobenzylguanidine scintigraphy for functional evaluation is therefore essential.

輸尿管肉癌瘤：病例報告

Sarcomatoid Carcinoma of Ureter: A Case Report

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INTRODUCTION: Sarcomatoid carcinoma is a high-grade epithelial neoplasm characterized by a biphasic appearance with epithelial component and sarcoma-like component. It is a well-known type of urinary tract tumor in urinary bladder and kidney. However this tumor rarely affects ureter. We report a case of this unusual tumor.

CASE REPORT: A 70-year-old female patient was a case of type 2 DM and CKG stage 5, HCVD and regular HD. She suffered acute gross hematuria and decreased Hb from 10.4 g/dl to 8.2 g/dl, decreased Hct from 31.4% to 24.8% and prominent RBC (> 100) in urine analysis. Series abdominal CT study found a progressive enlarged long segmental intraluminal mass in the left upper ureter with obstructive hydronephrosis and hyperdense blood clot in the left pelvicaliceal system. Left nephroureterectomy with a bladder cuff found a brown, polypoid and necrotic tumor about 9.5cm * 2.0cm * 1.0cm in upper ureter without involvement of kidney and urinary bladder. Microscopic evaluation showed high-grade uroepithelial carcinoma with sarcomatoid carcinoma composed of pleomorphic tumor cells in sheet like patterns or discohesive tumor cells.

DISCUSSION: Sarcomatoid carcinoma of the ureter is a rare tumor and the prognosis of sarcomatoid carcinoma of the urinary tract is generally poor. Thus, constant careful monitoring of HD patient will be necessary.

PT076-GU

腎透明細胞癌併有肉瘤樣分化：病例報告

Renal Clear Cell Carcinoma with Sarcomatoid Change: A Case Report

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INTRODUCTION: Renal cell carcinoma (RCC) is the most common malignancy of the kidney consisting multiple subtypes. Clear cell carcinoma is the most common type of RCC, and is commonly noted incidentally rather than clinical palpable mass or even distant metastasis. We report a case of clear cell carcinoma of kidney with initial presentation of dyspnea and multiple lung masses due to metastasis.

CASE REPORT: A 60 year old man visited chest clinic due to recent dyspnea and multiple pulmonary nodular lesions on routine yearly chest x-ray check-up. The patient was admitted to the chest ward for further evaluation under tentative diagnosis of possible advanced lung cancer. Chest CT study revealed multiple pulmonary nodules and masses scattered in bilateral lungs, with the largest mass at right middle lobe (RML) of lung. CT-guided biopsy of the RML lesion was performed, with an ambiguous pathology report of poorly differentiated carcinoma. Further immunohistochemical stains revealed positive results for CK and Paried-box gene 8 (PAX8), which leads to suspicion of possible primary origin from thyroid, pancreas, or kidney. Further abdominal CT study and CT-guided biopsy confirmed the final diagnosis of right renal cell carcinoma of predominantly clear cell type with 40-50% sarcomatoid change.

DISCUSSION: RCC is the most common malignancy of the kidney, consisting more than 90% of renal cancers. According to the histologic classification of RCC by World Health Organization (WHO), the clear cell histologic subtype is by far the most common, comprising 70% of all cases. Sarcomatoid RCC is considered a form of dedifferentiated carcinoma and is therefore not a distinct histologic entity. Sarcomatoid differentiation is reported to occur in approximately 1-8% of RCCs, and often shows aggressive clinical course with rapid growth, distant metastasis, and poor prognosis. Such as in our case, initial presentation with multiple distant metastases can be a diagnostic challenge in finding the primary source of the tumor. Renal cell carcinoma with sarcomatoid differentiation often shows rapid growth with strong enhancement and prominent necrosis, as seen in any aggressive tumor. Investigation into the imaging features of sarcomatoid dedifferentiation of RCC has been limited. However, recent development in pathology with immunohistochemical makers can help with the diagnosis. PAX8 is a novel immunohistochemical marker for differentiation between various types of tumor. Several studies have reported that PAX8 is expressed at high levels in specific types of tumor, including thyroid carcinoma, renal carcinoma, pancreatic neuroendocrine tumor, and ovarian epithelial carcinoma. Awareness of imaging characteristics of sarcomatoid renal cell carcinoma as well as its fulminant clinical course is important as a correct diagnosis can affect treatment plans.

陰囊纖維假性腫瘤之多功能磁振造影影像：病例報告

Multiparametric Magnetic Resonance Imaging of Fibrous Pseudotumor in Scrotum:

A Case Report

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INTRODUCTION: Scrotal tumor includes testicular tumor and extratesticular tumor. Sometimes it is hard to differentiate benign from malignancy via sonography. Scrotal fibrous pseudotumor is a rare extratesticular mass, but is the second most common benign extratesticular tumor, resulting from inflammatory reaction rather than a real neoplasm. The typical image findings of fibrous pseudotumor are low signal intensity on all sequences and delayed enhancement on post contrast image. However, the components of fibrous pseudotumor would cause the signal and enhancement change on multiparametric MRI. This study aims to demonstrate the signal change of scrotal fibrous tumor on multiparametric MRI.

CASE REPORT: We report a case of 33-year old male with progressive enlarged mass in right scrotum. Fibrous pseudotumor was impressed preoperatively according to multiparametric MRI, which showed heterogenous hypointensity on T1WI, T2WI, ADC and DWI with type 2 plateau enhancement in dynamic contrast enhanced study. He received tumor excision instead of orchiectomy and recovered well without recurrence in follow up.

DISCUSSION: The dynamic contrast enhanced MRI provide information for lesion perfusion and microvascular permeability that help predicting their biologic behavior. The typical enhancement pattern for fibrous tumor is delayed and persistent enhancement. However, In this case, plateau enhancement pattern was noted, which mimic malignancy. This is corresponding to neovascular proliferation in the pseudotumor. And the typical presentation on T1WI, T2Wi and DWI support the diagnosis of fibrous pseudotumor. Therefore, carefully evaluated the signal change prompt the accurate diagnosis and avoid unnecessary orchiectomy.

PT078-GU

生殖器官淋巴瘤：病例報告

Lymphoma of Scrotum: A Case Report

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INTRODUCTION: Primary lymphoma generally arises from lymph nodes, and the extranodal lymphoma is usually at the lymph-rich regions. However, lymphoma, which can be located at different sites with varying patterns, is the great imitator. In the patients with extranodal lymphoma, non-Hodgkin lymphoma is 8 times more than Hodgkin lymphoma. The most two common cell types of non-Hadgkin lymphoma are diffuse large B cell lymphoma and follicular lymphoma. The prior one is more aggressive, and the later one is indolent. This article demonstrates a case of primary penile large B cell lymphoma, which is extreme rare. Searching on PUBMED, there are less than 50 published cases.

CASE REPORT: The 55-year-old male had urolithiasis and received ureterorenoscopic stone manipulation 7 months ago before this admission. Two weeks ago, he found one palpable non-painful mass at right side of scrotum incidentally. He denied neither risky sexual exposure in the past one year or skin lesion over external genital organs. He did not have fever, general malaise, significant weight loss, or night sweating. He came to our outpatient department. On physical examination, there was one 2.0*1.5 cm soft mass at right side of scrotum without urethral discharge or enlarged inguinal lymph nodes. The lab data showed WBC: 5900/uL, Segmented form: 41%, Band form: 0%, CRP: 0.193 mg/dL. The pelvic CT with/without contrast enhancement revealed one well defined enhanced soft tissue lesion, 3.3 x 3.4 x 7.3 cm in size, below proximal part of penile shaft and attach to it. There was no abnormal enhancement focus in the corpus spongiosum and cavernosum, and the regional perineal fat was clear. Both testes, prostate, and seminal vesicles looked normal. There was no pathologic size of lymph nodes. His serum tumor markers, including CEA, CA19-9, PSA, beta-HCG, were in the normal range. He received tumor excision, and the frozen section revealed malignant lymphoma. Special stain showed CK (-), CD20 (+), CD3 (-), CD45RO (-), and the diagnosis was diffuse large B-cell lymphoma.

DISCUSSION: The whole body bone scan with Tc-99m MDP had no definite evidence of bony metastasis.

經動脈栓塞術治療頑固性膀胱出血：三病例報告

Refractory Bladder Hemorrhage Treated with Superselective Transcatheter Arterial Embolization: Three Cases Report

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INTRODUCTION: Vesical hemorrhage is frequent and sometimes life-threatening. Therapeutic options include bladder irrigation and supportive transfusion, intravesical instillation, endourological intervention, and surgical intervention which have limited success and high morbidity rates.

CASE REPORT: We present three cases of refractory bladder hemorrhage by different etiology, successfully treated with superselective transarterial embolization.

DISCUSSION: The technique is safe and effective in the management of bladder haemorrhage and is particularly valuable in severe cases where the patient's life is at risk. Further investigation is required for long-term efficacy of the procedure.

PT080-GU

巨大腹膜後平滑肌肉瘤：病例報告

Huge Retroperitoneal Leiomyosarcoma: A Case Report

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INTRODUCTION: Leiomyosarcoma represents approximately 9% of all soft tissue sarcoma and is the second most commonly (28%) documented primary retroperitoneal sarcoma after liposarcoma. It primarily affects the 5th to 6th decades of life. Retroperitoneal leiomyosarcomas are more common in women, with peripheral soft tissue or vascular lesions predominating in men. Clinical presentation in the retroperitoneum, tumors may be an abdominal mass, pain, distension, weight loss. Here we present the case of a huge retroperitoneal leiomyosarcoma and a brief literature review.

CASE REPORT: A 70-year-old woman suffered from epigastralgia, and went for gastroscopy. Clinician found a palpable abdominal mass. The abdominopelvic computed tomography(CT) showed a huge right abdominopelvic retroperitoneal mass displacing the duodenum, pancreas, ascending colon and stomach anteriorly, involving the infrarenal inferior vena cava, and compressing right upper ureter, causing moderate hydronephrosis. Distance metastasis to the liver presents. This mass was hypervascular and necrotic. The CT-guided biopsy revealed smooth muscle neoplasm. She was operated under the diagnosis of a retroperitoneal smooth muscle neoplasm. The tumor was located in the retroperitoneal cavity. Its pelvic retroperitoneal portion was partial debulked. Its histopathology was leiomyosarcoma of the retroperitoneum.

DISCUSSION: From the pre-operative CT images, the origin of this huge retroperitoneal leiomyosarcoma is from the infrarenal inferior vena cava. Its prognosis in this old-aged woman is poor. For retroperitoneal leiomyosarcoma, it is necessary to customize the treatment strategy on a case-by-case basis.

腎惡性血管內皮細胞瘤：病例報告

Malignant Hemangiopericytoma of Kidney: A Case Report

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INTRODUCTION: Hemangiopericytoma is a rare disease. Pre-operative diagnosis with this disease is difficult. Few cases reported before. Most of them did not received modern diagnostic tools examination such as computer tomography or magnetic resonance imaging. A case of pathologic proved malignant hemangiopericytoma of left kidney received these images study before operation. We try to analysis the images finding if this may be helpful for preoperative diagnosis.

CASE REPORT: A 72 years old woman who suffered from general malaise, poor appetite and body weight loss for a month. She was referred to our hospital for further work up. Physical examination disclosed a left hypochondral mass. Multidetector computer tomography and magnetic resonance imaging showed a huge retroperitoneal mass about 20cm in greatest dimension arise from upper pole of left kidney. Open radical nephrectomy done. Pathology reported that the mass was a malignant hemangiopericytoma of left kidney. The CT and MR images are analysis. The finding of these two image modalities is similar. A huge retroperitoneal mass arise from upper pole of left kidney. Discrete tumor necrosis and cystic degeneration are prominent. Linear and dot enhancement at early post-contrast phase strongly suggesting of prominent vasculature of the tumor. No fatty component or calcification with our diagnostic image.

DISCUSSION: The CT and MR images finding is non-specific for diagnosis of malignant hemangiopericytoma. A huge renal tumor with no fatty component but prominent vasculature with early contrast enhanced phase, discrete tumor necrosis and cystic degeneration may suggesting of the diagnosis of renal hemangiopericytoma.

PT082-OG

原發性卵巢淋巴瘤的具鑑別診斷性之影像表現：病例報告

Significant Image Finding in Primary Ovarian Lymphoma: A Case Report

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INTRODUCTION: Primary lymphoma presenting as ovarian tumor is rare, and may cause confusion for the clinician since its presentation might resemble other much more frequent tumors.

CASE REPORT: We reported a 48-year-old female with palpable lower abdominal mass and dysmenorrhea for one month. No elevated CA125 and CEA. Sonography and computed tomography (CT) showed a 10cm lobulated right adnexal tumor. Laparotomy right salpingo-oophorectomy was performed and biopsy frozen proved to be diffuse large B-cell lymphoma.

DISCUSSION: Primary lymphoma is rare, accounting for 0.5% of NHL and 1.5% of ovarian tumors. In this case, sandwich sign and prominent right gonadal vein on CT images may lead to the diagnosis of right ovarian lymphoma.

良性轉移性肌瘤：罕見病例報告

Benign Metastasizing Leiomyoma of Lung and Pelvis: A Rare Case Report

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INTRODUCTION: Benign metastasizing leiomyoma is a rare condition affecting woman with coexisting or history of uterine leiomyoma.

CASE REPORT: A 52 years old female with history of uterine leiomyoma S/P hysterectomy at seven year ago. Incidentally multiple masses at both lungs were revealed by recent chest film. CT guided biopsy was done. Then another mass was seen at pelvis by pelvic ultrasound and CT studies. Metastasizing leiomyoma was proved by pathology finally.

DISCUSSION: Metastasis, often leading to the majority of cancer-related deaths and mark a tumor as malignant. But benign metastasizing leiomyoma is characterized by multiple benign smooth muscle tumors of the lung with coexisting uterine leiomyoma at late reproductive-age woman. In our case, not only masses at both lungs but also another mass at pelvis.

PT084-OG

磁共振影評估復發侵襲性血管黏液瘤：病例報告

Evaluate Recurrent Aggressive Angiomyxoma Using MRI: A Case Report

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INTRODUCTION: Aggressive angiomyxoma is a rare mesenchymal neoplasm in the perineal region and often misdiagnosed as other common diseases, such as lipoma and Bartholin's cyst. The tumor shows infiltrative and slow growing potential with high frequency of local recurrence. MRI is a crucial image modality for diagnosis and preoperative planning.

CASE REPORT: We reported a 39-year-old woman with a progressive bulging mass in the right vulva. The pathologic result is aggressive angiomyxoma. The postoperative follow-up MRI images reveal huge mass extension from right pelvis to right vulva as recurrent aggressive angiomyxoma. The mass does not show diffusion restriction on diffusion weighted MR images. And the dynamic contrast enhanced MR images show a shape of quick enhancement and followed by slow enhancement on time intensity curve (TIC).

DISCUSSION: In this case report, we review relevant literature and discuss the MRI findings and pathologic correlation of aggressive angiomyxoma.

腹膜結核結合升高 CA-125 誤為卵巢癌腹膜轉移癌：病例報告
Peritoneal Tuberculosis with Elevated CA-125 Mimicking Ovarian Cancer with
Carcinomatosis Peritonei

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INTRODUCTION: Diagnosis of extrapulmonary tuberculosis is difficult. Peritoneal involvement is seen in association with genitourinary and gastrointestinal tuberculosis. CA-125 can elevate in ovarian cancer and peritoneal tuberculosis. We report a case of peritoneal tuberculosis with elevation CA-125 mimicking ovarian cancer with carcinomatosis peritonei.

CASE REPORT: A 56-year-old woman had suffered from abdominal fullness for three months. She had had general malaise, nausea and vomiting two weeks earlier. She had lost about 6 kg during the 3 months. Abdominal sonography revealed ascites. Laboratory data showed normocytic anemia, with hemoglobin 10.3 ng/dL, and CA 125 level elevated to 188.6 U/mL (normal range, < 35 U/mL). Abdominal and pelvic computed tomography (CT) revealed multiloculated ascites in her abdomen and pelvis, thickened peritoneum and bilateral convoluted and dilated fallopian tubes, diffuse stranding of the omentum and small mesenteric nodules, enlarged mesenteric and paraaortic lymph nodes and left ovarian mass. Under the impression of ovarian cancer with carcinomatosis peritonei, she was admitted and exploratory laparotomy was performed. The operative findings included small nodules in the peritoneum, omentum, small bowel loops, uterus, and fallopian tubes and severe adhesions between bowel loops, the left ovary and the pelvic side wall. Surgical diagnosis was carcinomatosis peritonei, so left salpingo-oophorectomy, enterolysis and peritoneum biopsy was done. The final diagnosis from the pathology turned to be tuberculosis peritonitis.

DISCUSSION: There is a high rate of misdiagnosis between advanced ovarian cancer and peritoneal tuberculosis. CA 125 is also elevated in patients with extrapulmonary tuberculosis. On CT images, a smooth peritoneum with minimal thickening and pronounced enhancement suggest peritoneal tuberculosis, whereas nodular implants and irregular peritoneal thickening suggest peritoneal carcinomatosis. We also noted that left adnexal masses, dilated and well enhanced fallopian tubes, and loculated ascites can provide important clues toward correct diagnosis for the infectious nature of tuberculosis.

PT086-OG

子宮平滑肌脂肪瘤與其惡性復發：罕見病例報告
Uterine Lipoleiomyoma with Malignant Change: A Rare Case Report

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INTRODUCTION: Uterine lipoleiomyoma is a rare benign tumor. A 34 years old woman received myomectomy and wedge resection due to large lipoleiomyoma was noted. In the further follow up, adnexal mass and small lung nodules were found. In large studies, 18.8% of patients with the uterine lipoleiomyoma were associated with gynecologic malignancies. We arranged operation for the patient.

CASE REPORT: A 34 years old woman came to our OPD due to pelvic mass. Physical examination showed a mass in the pelvis. The ultrasound showed a 10.9 x 8.5 cm mass in the uterus. The CT survey showed a heterogeneous-attenuation mass lesion with fat content at uterus, size about 8.5 x 7.0 cm. Thus, myomectomy and wedge resection was done. The pathology report showed lipoleiomyoma. Few years later, adnexal mass was found during following ultrasound survey. The CT scan showed fatty tumor extending in the bilateral oviducts with a 2.3 cm cystic lesion at right ovarian. Also, newly nodules in the liver and left lower lobe of lung were found in this survey. Under the impression of recurrent tumor, we arranged operation for the patient.

DISCUSSION: The lipoleiomyoma malignant change is rare. In large studies, 18.8% of patients with the uterine lipoleiomyoma were associated with gynecologic malignancies. It contains variable amounts of fat, fibrous tissue, and smooth muscle. Some may have malignant change. We discuss the image finding of the survey series in our report.

自發性肝腫瘤破裂之緊急栓塞：單一醫學中心之治療經驗

Emergent Transarterial Embolization for Spontaneous Rupture of Hepatocellular Carcinoma: Single-Center Experience

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PURPOSE: Liver cancer is a frequently diagnosed cancer worldwide (the fifth in men and the seventh in women). More than half a million hepatocellular carcinoma (HCC) cases are diagnosed worldwide every year. Hepatocellular carcinoma (HCC) is the second leading cause of cancer-related death in Taiwan. Spontaneous rupture of hepatocellular carcinoma is a life-threatening complication with varied incidence and high mortality. The aim of this study was to assess the clinical features and survival rate in patients with a spontaneous ruptured hepatocellular carcinoma and treated with transarterial embolization.

MATERIALS AND METHODS: A 3-year retrospective study was performed on all 38 patients with spontaneous rupture of hepatocellular carcinoma and emergent transarterial embolization who presented from 2010 to 2012. The clinical features, laboratory and image findings of groups with different survival periods were compared.

RESULTS: The group who died (n=17) presented worse clinical condition and elder status than the group who survived (n=21). The group who died had a poorer Child-Pugh class, lower hemoglobin and serum albumin levels, higher demand for blood transfusion, greater prevalence of portal vein thrombosis, and higher serum total bilirubin and aspartate aminotransferase levels. Successful hemostasis with transcatheter arterial embolization was achieved in 87% of patients (30-day mortality rate, 45%). Two of the group who survived received second-stage hepatic resection.

CONCLUSION: Emergency transcatheter arterial embolization is a minimally invasive and effective treatment for hemostasis of ruptured hepatocellular carcinoma. However, patients with poorer clinical condition and elder status are at high risk of death.

PT088-IR

影像導引之肺部惡性腫瘤冷凍治療：單一院所初步結果

Image-guided Cryoablation for Malignant Lung Tumors: Single Center Results

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PURPOSE: To report result in cryoablation for primary or secondary malignant lung tumors

MATERIALS AND METHODS: From 2009 to 2013, cryoablation were applied in 37 patients (mean age: 50.7, 12-89 years old; male: 28, female: 9) who were not suitable for surgery due to comorbidities and were referred by clinician. Sixty-four sessions with eighty-six tumors (size: 0.5-9.8cm) of cryoablation were performed under intravenous general sedation or pain control. Two or three freeze-thaw cycles were performed to make sure the ablation zone covering at least 5 mm beyond tumor margin except six sessions for palliative purpose. Local tumor progression was monitored by contrast-enhanced CT scan in 1-, 3-, 6-, 12-, 18-, 24- months interval, respectively.

RESULTS: All sessions were performed successfully without procedure-related mortality. Morbidity consists of 6.25% (4 of 64) major pneumothorax needed chest tube drainage, 4.69% (3 of 64) hemothorax, 1.56% (1 of 64) moderate hemoptysis, bronchopleural fistula, and skin damage (frostbite). Overall 1-, and 2-year survival rate in all patients are 87.5% and 81.7%. For curative intent, the 1-, and 2-year local tumor control rate are 81.6% and 78.9%. Stratified local tumor control rate by tumor size showed that 1- and 2-year local control rate for tumor less than 2cm diameter are 88.1%, and 84.6%, respectively, and 68.7% and 68.7% for tumor larger than 2cm.

CONCLUSION: Image-guided cryoablation is safe and effective for non-operable lung tumors, especially for tumor size less than 2cm in diameter. The short- to mid-term overall survival rate and local control rate suggest cryoablation is one of the options for local treatment for malignant tumor in inoperable patient due to medical comorbidities.

腎臟腫瘤術前血管栓塞治療 Preoperative TAE for Renal Tumors

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PURPOSE: To evaluate the outcome of preoperative TAE for renal tumors.

MATERIALS AND METHODS: We retrospectively reviewed medical records of patients who received partial nephrectomy for renal tumors between January 2012 and September 2013. The patients are divided into two groups—with and without preoperative TAE for renal tumors. The image findings of renal tumors, including CT, MRI, and angiographies are reviewed. The clinical data about the outcome of preoperative TAE was collected and compared between the two groups.

RESULTS: Total 25 patients received preoperative TAE and 17 patients did not. There is no significant difference in tumor location ($p=0.41$), tumor size ($p=0.59$), and pathologic results ($p=0.55$) between two groups. But the total blood loss during the operation ($p=0.01$) and the total hospitalization ($p=0.04$) are significant different between two groups.

CONCLUSION: Preoperative TAE allows decreasing blood loss and hospitalization for patients who are going to receive partial nephrectomy for renal tumors.

PT090-IR

在電腦斷層指引下熱射頻治療肝癌：影響長期愈後的因素 CT-guided Radiofrequency Ablation for Treatment of HCC: Factors Affect Long Term Result

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PURPOSE: To determine the therapeutic effectiveness and complication of computed tomography (CT)-guided radiofrequency ablation (RFA) for hepatocellular carcinomas (HCCs) and estimate prognostic factors.

MATERIALS AND METHODS: From May 2003 to May 2011, CT-guided RF ablation with use of internally cooled electrodes was performed in 210 patients (144 men and 66 women) with 358 HCCs (diameter range, 0.8-10 cm) in 324 sessions. The efficacy of RFA was evaluated using contrast-enhanced dynamic CT 2 months after treatment and then every 3-4 months. Two radiologists retrospectively evaluated in consensus the presence or absence of complications as well as the survival rate and the primary effect at CT performed 2 months after RF ablation. Disease-free survival (DFS) and overall survival (OS) were statistically analysed using the Kaplan-Meier method. Factors determining DFS and OS were analysed using Cox regression model.

RESULTS: Major complication of CT-guided RFA for HCCs immediately after RFA was 1.3%. Complete necrosis was seen in 95% with diameters of 3.0 cm or less and 87% with diameters of 5.0 cm or less. The 3- and 5-years OS was 57.7% and 38.5% respectively, and the 3- and 5-years DFS was 38.2% and 27.5% respectively while the local tumor progression rates at 1 and 3 years were 23.6% and 31.4%. Statistically significant prognostic factors in OS in univariate and multivariate analysis were tumor number, tumor size and naïve or not, in DFS were tumor size and naïve or not, while in primary effect were tumor size, tumor margin, tumor location and ablative margin.

CONCLUSION: CT-guided percutaneous RFA is effective and safe technique for the treatment of unresectable HCCs resulting in high survival rates. We confirmed some generally accepted prognostic factors influencing long-term outcomes and shown the impact of tumor location affecting primary effect.

電腦斷層導引肺部切片在某區域醫院執行三年來的經驗分享
Three-Year Experience in a Regional Hospital for CT-guided Percutaneous Coaxial
Needle Lung Biopsy

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PURPOSE: We had established CT-guided percutaneous coaxial needle lung biopsy as one routine procedure in our regional hospital for 3 years. We retrospectively evaluate the risk and outcome.

MATERIALS AND METHODS: Between November 2010 and December 2013, we had performed 49 CT-guided lung biopsies in 48 patients (29 male and 19 female). Lesion location, size, depth, biopsy needle-pleural angle, complicated pneumothorax and pulmonary bleeding were collected and graded.

RESULTS: In 48 CT-guided lung biopsies, the mean diameter of lung lesions was 39.1mm. The mean distance from pleural to lesion surface along needle path was 16.0mm. Totally, 28 malignancies, 6 tuberculosis, and 1 aspergillosis were diagnosed. There were 20 pneumothoraxes (40.8%), but only one male received chest tube insertion for dyspnea (2.0%). Scanty pulmonary hemorrhage occurred in 10 patients (20.4%), and mild hemoptysis happened in 4 patient (8.1%).

CONCLUSION: Our overall complication rate was within acceptable range, and most patients stood the whole procedure smoothly, except one chest tube placement. CT-guided percutaneous coaxial needle lung biopsy was reliable and safe procedure, even in regional hospital.

經動脈導管栓塞治療臨床有症狀之肝臟血管瘤
Transcatheter Arterial Embolization of Symptomatic Cavernous Hemangiomas of the Liver

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PURPOSE: This retrospective study evaluated the clinical and radiologic results of transcatheter arterial embolization (TAE) for the treatment of symptomatic cavernous hemangioma of the liver. The technique, complication and effectiveness were also analyzed.

MATERIALS AND METHODS: During October 2008 to October 2013, four patients (all are female) with symptomatic cavernous hemangioma of the liver were treated by TAE with gelfoam pieces with/without steel coils. Tumor characterization, including size, number and extension, was done on tri-phase multi-slice computed tomography (CT) or gadolinium-enhanced dynamic magnetic resonance imaging (MRI). The imaging findings were reviewed by two interventional radiologists with 3-year and 20-year experience.

RESULTS: The tumor was single in two patients and multiple in the other ones. The largest diameter of the tumor was 6-20 cm (mean: 11.4 cm). The treatment response was assessed on follow-up contrast-enhanced CT or MRI. Indications for TAE were abdominal pain or fullness (all patients) and tumor bleeding or rupture (two patients). TAE was the only method for all patients without treatment-related death or morbidity. The symptomatic improvement and decreased size were documented in two patients, whom the lesion was single. The mean size of multiple lesions in the other two patients didn't show significant change in the follow-up examination.

CONCLUSION: TAE of hepatic cavernous hemangioma is a useful treatment for symptomatic patient, especially the single lesion.

射頻燒灼術在晚期肝癌治療之經驗分享

RFA for Advanced Multiple Hepatocellular Carcinoma: the Experience of a Single General Hospital

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INTRODUCTION: American Association for the Study of Liver Diseases (AASLD) advocates use of the BCLC staging system because it links each tumor stage with appropriate therapeutic interventions in a guideline format. The aim of treatment for radiologic BCLC stages B and C disease is extension of life expectancy or improved quality of life. There are many palliative treatment options available, but only transarterial chemoembolization (TACE) and the molecularly targeted therapy with sorafenib are integrated into the BCLC staging system since they have been demonstrated to prolong life in adequately powered randomized trials. We report a case of advanced hepatocellular carcinoma (HCC) downstaged to become surgically resectable through a combination therapy of radiofrequency thermal ablation (RFA) and targeted therapy with sorafenib after TACE with doxorubicin-eluting beads (DC Bead).

CASE REPORT: A 37-year-old male HBV carrier was admitted due to body weight loss of three kilograms in two months. Initial abdominal sonography revealed a large tumor mass at the right lobe of liver. Elevated AFP was noted. Subsequent abdomen CT study identified a huge (about 19cm) heterogeneously enhancing mass lesion over the right lobe of liver and another nodule at segment 4 of liver. Bloody ascites; liver hilum, mesentery, and para-aortic lymphadenopathy; IVC tumor thrombus; and multiple metastatic nodules over bilateral lung fields are also present. Therefore, the diagnosis of HBV related hepatocellular carcinoma with suspected intraperitoneal tumor rupture, stage IVB (T3bN1M1), BCLC stage C, was considered. TACE was performed four times with the use of DC bead three times over a period of three months regular follow-up since initial tumor detection. RFA was performed after the first TACE for the S4 tumor nodule. Palliative targeted therapy (sorafenib) was prescribed for distant metastases. Follow-up chest CT study at 5 months since initial tumor detection showed significant regression of multiple lung metastases. In addition, abdomen CT study at 6 months demonstrated apparent tumor shrinkage with prominent central necrosis and no viable tumor at S4 with left lobe hypertrophy. Surgical downstaging was thus indicated and the patient received palliative right hepatectomy with subsegmentectomy of S4 & S3. The patient tolerated all of the treatment modalities well without complications.

DISCUSSION: Surgical downstaging of advanced hepatocellular carcinoma is achieved in our patient after a combination therapy of TACE with DC beads, RFA, and targeted therapy. Although current treatment algorithm favors palliative treatment for advanced stage HCC, when a patient is relatively young and is capable of tolerating the risks and side effects of all of the above treatment modalities may consider a more aggressive approach of management.

動脈血管栓塞術成功治療結節性硬化症併發急性後腹腔出血：病例報告

Tuberous Sclerosis Complex Complicating Acute Retroperitoneal Hemorrhages Received Successful Transcatheter Arterial Embolization: A Case Report

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INTRODUCTION: Tuberous sclerosis complex is a rare multi-focal hamartomas and malformations that may affect CNS, eyes, heart, kidneys, lungs, and skin.

CASE REPORT: We present a 37 year-old female who has family of tuberous sclerosis. She had a right spontaneous pneumothorax several years ago and diagnosed lung lymphangiomyomatosis. Renal angiomyolipomas (AMLs) were also noted for a long time. This time, she suffered from acute left retroperitoneal hemorrhage from AMLs ruptured and received successful emergent transcatheter arterial embolization (TAE). We reviewed her available images about tuberous sclerosis.

CONCLUSION: Tuberous sclerosis may complicate spontaneous retroperitoneal hemorrhage. Selective arterial embolization is a rather safe and effective technique to treat AMLs both urgently and preventively.

於肝移植病患直接穿刺栓塞肝動脈偽動脈瘤：病例報告
Direct Puncture Coil Embolization of Hepatic Arterial Pseudoaneurysm in Liver
ransplantation Patient: A Case Report

曾修山

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INTRODUCTION: Hepatic arterial pseudoaneurysm is one of the complications after liver transplantation. Without proper treatment, the pseudoaneurysm may rupture and result shock or graft failure. The pseudoaneurysm could be treated after superselection with microcatheter and microcoils. However, if the microcatheter cannot select into the pseudoaneurysm, the tradition transcatheter approach would be impossible. Stent-graft implantation is another choice. But as small caliber of hepatic artery, and possible tortuosity of hepatic artery, stent-graft implantation is difficult and possible causes acute thrombosis. Here, we report a case of hepatic artery pseudoaneurysm after deceased donor liver transplantation successfully treated by direct puncture the pseudoaneurysm.

CASE REPORT: A 47 y/o male diagnosed chronic hepatitis C with hepatocellular carcinoma. He had received two times of TACE to treat HCC in 2005. On 2008/12/30 he received DDLT on Mainland China. Routine follow-up CT scan after transplantation revealed a small pseudoaneurysm near the hepatic artery anastomosis. Angiography was carried out and two pseudoaneurysm were found. The smaller one was successfully embolized with microcatheter and microcoils. However, the bigger one cannot be treated for failure to advance the microcatheter into the pseudoaneurysm.

Under sonography guidance, and fluoroscopy control, we direct puncture the pseudoaneurysm with a 21 gauge PTC needle. Several microcoils were then pushed into the aneurysm. Five days later, follow-up angiography showed complete obliteration of the pseudoaneurysm and still patent hepatic artery.

DISCUSSION: Hepatic artery pseudoaneurysm could be treated with direct puncture coils embolization if conventional transcatheter coils embolization is failed.

PT096-MS

脂肪墊 T2* 值之訊號變化與組織學之關聯性研究：利用老鼠之前十字韌帶截斷模型
T2* Value Change of Hoffa's Fat Pad with Histologic Correlation in a Rat Model of
Anterior Cruciate Ligament Transection

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PURPOSE: The infrapatellar fat pad (often known as Hoffa's pad) is a soft tissue that lies underneath the patella and helps to protect the knee like a shock absorber. The anterior cruciate ligament (ACL) attaches proximally at the femoral condyle, and runs distally to the anterior tibia to provide the stability of the knee joint. When the deficiency of ACL occurs, instability of the knee joint causing stretching and impingement of the fat pad between the femur and tibia may induce Hoffa's fat pad injury¹. Thus, we try to use MR T2* measurement and histologic correlation to investigate the MR signal alternations of Hoffa's fat pad after anterior cruciate ligament transection (ACLX) in a rat model.

MATERIALS AND METHODS: Eighteen male Sprague Dawley rats were randomly separated into three groups (n=6 each group). Group 1 was the normal control group. Groups 2 and 3 received ACLX and sham-ACLX, respectively², of the right knee. T2* values were measured in the Hoffa's fat pad of all rats at 0, 4, 13, and 18 weeks after surgery. After the image acquisition was completed, all data were calculated the mean values of the signal intensity, regions of interest (ROIs) were drawn manually on the infrapatellar fat pad by referencing to the first-echo T2* image. Generalized Estimating Equation (GEE) multiple linear regressions were used to assess the interaction of groups or side with time (0, 4, 13, and 18 weeks). P values <0.05 were regarded as statistically significant. The rats were sacrificed following imaging at week 18 to take histological analysis and correlation.

RESULTS: In the ACLX group, we observed that T2* values increased significantly in infrapatellar fat pad of right knee from 13 weeks as compare with left knee (T2* value is 20.32±1.05, 15.42±2.02msec respectively, p<0.05). Hoffa's fat pad T2* values were significantly higher at 13, and 18 weeks postoperatively in rats of the ACLX group than in rats of the control and sham groups (p<0.05). The T2* value increase were not significant between normal and sham groups.

CONCLUSION: Quantitative MR T2* measurements of Hoffa's fat pad are feasible. Signal intensity change in T2* over time in Hoffa's fat pad was addresses in this study. This information could be potentially useful for in vivo monitoring of knee instability.

卡介苗接種的晚期併發骨髓炎的影像學表現 Imaging Appearances of Osteomyelitis as a Late Complication of Bacille Calmette-Gurin Vaccination

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PURPOSE: Bacille Calmette-Guérin (BCG) osteomyelitis is a very rare complication of BCG vaccination. The incidence rate of disseminated complications such as extra-regional localized abscesses, lymphadenitis, and osteomyelitis was approximately 1 or 2 per several million vaccine recipients. In this article, we will discuss the image features of BCG-related osteomyelitis and review the related literature.

METHOD: In this retrospective study, we reviewed the pathologic reports of osteomyelitis in infant and young children less than 2 year-olds, who had no underlying immunodeficiency disorders in last 5 years. BCG osteomyelitis was confirmed by polymerase chain reaction. Image features including radiograph and magnetic resonance imaging (MRI) were discussed.

RESULTS: During the period, a total of eight patients had pathologic proved osteomyelitis. Five patients were proved BCG relative osteomyelitis finally. All patients revealed limping gait clinically. Radiographs showed osteolytic lesions with cortical destruction, three in the talus, one case in proximal tibia and the other one in distal femur. MRI showed pedicle-based juxtacortical space occupying lesions communicating with the cortex and marrow space and two lesions with transphyseal invasion. Adjacent septic arthritis was also noted in 4 cases.

CONCLUSION: This complication of BCG-related osteomyelitis, although uncommon, should be considered in the appropriate clinical setting in an infant osteomyelitis in Taiwan.

PT098-MS

雙能電腦斷層虛擬高能量影像降低骨折內固定金屬植入物金屬假影以提升骨折癒合或不癒合診斷正確性

Dual Energy CT Virtual Monochromatic Spectral High Energy Images Improve Diagnostic Accuracy of Union or Nonunion in Fractures after Internal Instrumentations by Elimination of Streak Artifacts

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PURPOSE: To investigate the ability of DECT with VMS high energy images (180 kVp) in elimination of streak artifacts caused by internal fixation instrumentations for fractures.

MATERIALS AND METHODS: 53 patients (30 males and 23 females) with 67 fractures of long bones after metallic instrumentations have undergone DECT were collected for study. Both image sets of VMS 180 kVp and linear-blended images (mixed 50 % 80 kVp and 50% 140 kVp) in axial, coronal and sagittal planes in 2-mm thickness were obtained from DECT. The distinguishability of the metallic instruments and the underlying bony cortex was evaluated with a distinct score by 3-level scoring scale (0: ambiguous; 1: equivocal; 2: confident). The distinct scores of the two image sets were analyzed with paired t-test for statistical significance.

RESULTS: The 67 fractures revealed 43 nonunion and 24 unions based on dual energy CT diagnosis. The distinct scores of both image sets in medial and lateral cortices on coronal planes, and anterior and posterior cortices on sagittal planes revealed marked statistical significance by paired t-test ($p < 0.001$) in all the 67 fractures, 43 nonunion and 24 unions respectively.

CONCLUSION: Dual energy CT with VMS 180kVp images has significant advantage over the linear-blended images simulating conventional MDCT in evaluation of healing status of fractures after metallic implants for internal fixation by markedly reducing streak artifacts and may aid in making decision about instrument revision for nonunion or instrument removal for union.

後肩盂不足對於後肩關節不穩定是否為一決定性因素或是解剖上之正常變異
Posterior Glenoid Rim Deficiency in Posterior Instability of the Shoulder, A Critical Point or Just Normal Variation?

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PURPOSE: To evaluate the clinical meaning of posterior rim deficiency in posterior instability of the shoulder.

MATERIALS AND METHODS: CT or MRI examinations of the shoulder in 327 patients from January 2012 to November 2013 were reviewed to check the shape of the posterior glenoid (pointed, Lazy J shaped, or delta shaped) due to some clinical requests. We excluded the patients with acute trauma and underlying inflammatory disease, causing bony destruction and erosion of the glenoid, and those with severe motion artifact. Besides images, we also reviewed the clinical charts to confirm the clinical symptom.

RESULTS: There four patients with posterior instability of the shoulder noted in clinical charts, all of whom have posterior glenoid deficiency. However, most of the patients without posterior instability of the shoulder also have posterior glenoid deficiency (Lazy J shaped or delta shaped).

CONCLUSION: Posterior rim deficiency is widespread noted in the patients with posterior instability of the shoulder, but also found in those without posterior instability of the shoulder in our study. We think posterior glenoid deficiency is a normal variant of the glenoid and just a risk factor for posterior instability of the shoulder rather than critical point because maintaining shoulder stability is a complicated mechanism.

PT100-MS

靜脈畸形骨肥大綜合徵與髂靜脈壓迫綜合徵共存
Klippel-Trenaunay Syndrome Coexisting With May-Thurner Syndrome

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PURPOSE: To evaluate patients of having Klippel-Trenaunay syndrome (KTS) co-existing with iliac vein compression syndrome by using concomitant multidetector computed tomography (MDCT) angiography and venography.

MATERIALS AND METHODS: We reviewed four patients with KTS co-existing with iliac vein compression syndrome. All patients received intravenous digital subtraction venography and concomitant MDCT angiography and venography.

RESULTS: All patients presented with a triad of varicose veins, cutaneous hemangiomas and hypertrophy of soft-tissue and bone over one extremity. All were successfully treated by left common iliac vein stenting for iliac vein compression syndrome followed by angioplasty for KTS.

CONCLUSION: Concomitant MDCT angiography and venography can be useful in displaying 3-D relation of iliac vein iliac vein compression syndrome, which is rarely considered as a co-existing disease of KTS, thereby helpful in achieving an appropriate treatment.

再訪膝關節韌帶撕裂的相關骨損傷

Osseous Injury Associated with Ligamentous Tear of the Knee Revisited

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PURPOSE: Sports are important components of modern life as people have more leisure time. Knee-related injury unsurprisingly is commonly encountered by the clinician.

MATERIALS AND METHODS: The goal of this exhibit is to describe the common osseous injury associated with the knee ligament including anterior cruciate ligament (ACL), posterior cruciate ligament (PCL), medial collateral ligament (MCL), and lateral collateral ligament (LCL). The imaging modality including radiograph and magnetic resonance imaging (MRI) to assess the traumatic knee will be discussed and reviewed.

RESULTS: The review of each intrinsic knee ligament and the respective osseous injury is as follow: ACL associated injury including Segond fracture, occult fracture, kissing contusion, sulcus sign, MR “anterior drawer” sign; PCL associated injury including reverse Segond fracture, osseous avulsion of the ligament, the “arcuate sign”; MCL associated injury including Pellegrini-Stieda disease, occult fracture.

CONCLUSION: After reviewing this exhibit the reader will have a better understanding of the common osseous injury associated with the knee ligament.

PT102-MS

股骨頸骨密度變化是伴有轉移的站立重量中風病人偏癱患者

Femoral Neck Bone Mineral Density Change is Associated with Shift in Standing Weight in Hemiparetic Stroke Patients

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PURPOSE: To explore the association between the proportion of body weight bearing of the paretic leg and the rate of femoral neck bone mineral density loss in acute first-ever stroke patients.

MATERIALS AND METHODS: Patients were divided into those bearing less weight (< 50%) on the paretic leg (P-group, n=11) and those bearing more weight (≥ 50%) on the paretic leg (N-group, n=11). The change in bone mineral density (g/cm²/year) was calculated from the initial and follow-up dual-energy x-ray absorptiometry (≥ 6 months). The proportion of body weight bearing was calculated from the body weights bearing of each leg, which were measured with the patient standing on a tilt table.

RESULTS: Compared with N-group patients, P-group patients had faster reduction in femoral neck bone mineral density. The proportion of body weight bearing was associated with the change in bone mineral density in paretic (adjusted r²=51.0%, P < 0.001) and nonparetic (adjusted r²=32.4%, P < 0.005) legs.

CONCLUSIONS: Stroke patients with proportion of body weight bearing of < 50% on the paretic leg experience faster bone loss and compromised bone density in the femoral neck. The proportion of body weight bearing may be useful to estimate the change in bone mineral density in paretic legs within the first year post-stroke.

以電腦斷層與核醫定量薦腸關節掃描診斷早期薦腸關節炎的回溯性比較研究
The Comparison of Computed Tomography to Quantitative Scintigraphy of Sacroiliac Joints in Diagnosing Early-staged Sacroiliitis: A Retrospective Study

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PURPOSE: Early-staged sacroiliitis is often questionably diagnosed in the absence of radiographic alterations. The objective of this retrospective study is to assess the utility of the multidetector computed tomography (MDCT) in comparison to quantitative scintigraphy of sacroiliac joints (qSJS) and sacroiliac joint-to-sacrum ratio (SI/S ratio) in the assessment of early-staged sacroiliitis.

MATERIALS AND METHODS: From January 2007 to December 2012, both 292 sacroiliac joints of 146 patients with clinical and laboratory evaluation, qSJS and MDCT were performed to evaluate the contribution of these imaging techniques to the diagnosis of early-staged sacroiliitis. The MDCT images of the SI joints architecture at our institute were reconstructed with 5 mm thickness of 12 transverse images and 3 mm thickness of 16 oblique coronal images parallel to upper sacrum. The MDCT images were graded from 0 (normal) to IV (fused) based on the degree of joint abnormality. The qSJS as a posterior planar film of the pelvis was obtained to calculate SI/S ratio 3 hr after injection of 740 MBq 99mTc- methylenediphosphona. The normal ranges of SI/S ratio were defined from our institute data which differed from age and gender. Individuals at early-staged sacroiliitis, defined by sacroiliitis graded by MDCT lower than grade II.

RESULTS: MDCT is more sensitive and superior to qSJS for the detection of early-staged sacroiliitis. A significant difference ($P < 0.001$) was found between the detection of early-staged sacroiliitis by using MDCT as compared with that when using the qSJS. The percentage and statistic will be presented.

CONCLUSION: For the assessment of early-staged sacroiliitis, MDCT is superior to qSJS. MDCT picks up an additional 37% of early case not diagnosed by scintigraphy. The qSJS is limited in replacing MDCT to detect early-staged sacroiliitis, but SI/S ratio still has value for monitoring the activity of sacroiliitis.

PT104-MS

腱鞘巨大細胞瘤：超音波、電腦斷層、磁振造影表徵及鑑別診斷
Giant Cell Tumor of the Tendon Sheath: Ultrasound, CT and MR Imaging Features and Differential Diagnosis

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PURPOSE: To assess the characteristic imaging features of giant cell tumor of the tendon sheath (GCTTS) and to differentiate from other masses adjacent to tendons.

MATERIALS AND METHODS: From October 2005 to October 2013, 51 pathologically proven masses adjacent to tendon were enrolled. The masses include group I, 20 GCTTS and group II, 31 non-GCTTS solid masses. Imaging features of the masses were reviewed. The relationships of masses to tendons (mass-tendon contact) were classified based on the short-axis sections through the tendon and include the mass, into type N, no contact; type I, have contact less than quarter of the tendon circumference; type II, the contact more than quarter of the tendon circumference; type III, the mass have beak-like projections between tendon and bone; type IV, dumbbell-shaped mass in between tendon and bone; type V, ring-shaped mass encircling the tendon. Masses with type I and II mass-tendon contacts were further classified into A, the contact convex to tendon; B, flat; and C, convex to mass.

RESULTS: All group I masses were well-defined with mass-contact of type I (5), type II (3), type III (3), type IV (6), and type V (3). In group II masses, the mass-tendon contact were type N (10), type I (16), type II (5), type III (0), type IV (0), and type V (0). Of the masses with type I and II mass-tendon contact, the contact borders in 8 of group I were A (0), B (3), and C (5), and in 21 of group II were A (8), B (10), and C (3).

CONCLUSION: The characters of mass-tendon contact of peritendinous mass are crucial for imaging differential diagnosis of GCTTS from other masses. The GCTTS tend to have type III, IV and V mass-tendon contact, and to be compressed by the adjacent tendon.

膝關節軟骨之 MR T2 值於慢性腎臟病之研究

MR T2 Values of the Knee Cartilage and Meniscus in Chronic Kidney Disease

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PURPOSE: Chronic kidney disease (CKD) is associated with a wide range of disorders of mineral and bone metabolism, including phosphate, calcium and parathyroid hormone dysregulation, renal osteodystrophy and vascular calcifications. Understanding this pathophysiology in mineral metabolism and bone diseases is very important, as recent evidence has suggested the concept of bone-vascular axis in CKD. However, the information for the articular cartilage and meniscus in CKD is limited. Quantitative MR T2 measurement provides a noninvasive method to evaluate the early changes of fiber architecture and water content in cartilage and meniscus. Therefore, our purpose of this study is to observe the MR T2 values of cartilage and menisci of the knee joint in CKD patients.

MATERIALS AND METHODS: We prospectively enrolled 11 patients with CKD and 8 age- and sex-matched controls for this study, including 11 men and 8 women. All subjects underwent 3.0T MR examinations (GE Healthcare, Discovery MR750, USA), blood tests, and bone mineral density examinations. After three-plane tri-pilot imaging, 20 contiguous axial T1-weighted images were acquired using a spin echo sequence with TR/TE = 600/14 ms, NEX = 1, matrix = 256 * 256, and slice thickness = 5 mm, for the purpose of later slice positioning in sagittal view. The single axial plane showing the largest width of femoral condyles on both the medial and lateral sides of the knee joint, which cover most of the menisci, was selected as the reference plane. Subsequently, sagittal images for the knee were acquired (eight slices per meniscus) with orientation parallel to the long axes of the femoral condyles. The T2 quantification was based on a multi-slice turbo spin-echo sequence with the following parameters: TR = 800 ms, TE = 5.8/11.6/17.4/23.2/29/34.8/40.6/46.4 ms, FOV = 18 cm, matrix = 256 * 192, echo train length = 8, NEX = 2, slice thickness = 3 mm, slice gap = 0.6 mm, BW = 62.50 kHz, and acquisition time = 10 min 18s. The statistical analyses were performed with SPSS software (version 20, SPSS, Inc, Chicago, IL, USA). To compare groups with CKD and the controls, the Student t test was applied.

RESULTS: T2 values of the anterior and posterior horns of the medial meniscus were significantly increased (P = 0.03 and = 0.04, respectively) in CKD patients as compared with the controls for men. Such a difference was, however, absent in women. T2 values of the anterior and posterior horns of the lateral meniscus and of the medial and lateral femoral condyles/tibia cartilage were not significantly different in CKD patients compared with the controls for both genders.

CONCLUSION: Preliminary findings from the present study suggest that CKD-related T2 changes in the medial meniscus may precede alterations in other cartilage regions. While the limited number of subjects included in this report precludes conclusive remarks, MR T2 measurements of cartilage and menisci may serve as an effective tool in the investigation of knee cartilage degradation in CKD.

擴散影像在旋轉肌腱部分破裂之應用

Added Value of Diffusion-weighted Imaging for Diagnosing Partial-thickness Rotator Cuff Tears in Health Care Screening

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PURPOSE: To investigate the diagnostic performance of diffusion-weighted magnetic resonance imaging (DWI) for assessment of partial-thickness rotator cuff tears by means of lesion to muscle signal intensity ratios (L/M SIR) as an alternative method.

MATERIALS AND METHODS: One hundred nine consecutive patients were studied (median age 50 years, range 21-85 years) by arthroscopy proved. Fat-suppression T2-weighted image (FS-T2WI) and DWI were compared. Receiver-operating characteristic (ROC) curves were compared using L/M SIR to assess the diagnostic performance of DWI and FS-T2WI, and a cut-off point for predicting partial-thickness tear was determined using the Youden index.

RESULTS: Seventy-three patients were diagnosed partial-thickness tears; others were no tears by arthroscopy. Area under ROC curves (AUC) for diagnosing partial-thickness tears with measurements is significantly higher for DWI (0.865) than for FS-T2WI (0.744) ($p=0.008$). Cut-off values of signal ratios for DWI and FS-T2WI were 1.06 and 1.65, respectively. The corresponding diagnostic results were derived as sensitivity=83.6%, specificity=80.6%, PPV=89.7%, NPV=80.6%, and accuracy=82.6% for the cut-off of 1.06 of L/M SIR via DWI; sensitivity=58.9%, specificity=86.1%, PPV=89.6%, NPV=50.8%, and accuracy=70.6% for the cut-off of 1.65 of L/M SIR via FS-T2WI.

CONCLUSION: DWI is more accurate and sensitive than FS-T2WI in the diagnosis of partial-thickness rotator cuff tear. DWI can be used as an alternative means of diagnosing partial-thickness tears when they are not easily differentiated using FS-T2WI.

PT107-MS

軟組織平滑肌肉瘤之超音波表現：十三個病例系列報告

Sonographic Appearance of Soft Tissue Leiomyosarcoma: A Case Series of Thirteen Cases

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PURPOSE: The purpose of the study is to evaluate the sonographic pattern in soft tissue leiomyosarcomas (LMS) in extremity.

Materials and Methods: Between 2001 and 2011, 13 patients (mean age, 60 years; range, 24-86 years) pathologically proven LMS, with sonography correlation are reported. Characteristic signs on sonography and patient outcomes are reviewed.

RESULTS: Most of our cases (n=11) are located at soft tissue of extremity. All 13 cases presented as hypoechogenicity. Lesions show macrolobulation (n=11), heterogeneous echogenicity (n=11), hypervascularity (n=11) in most cases. Lesions with hypovascularity or without macrolobulation are smaller lesions comparing to others. Two cases show cystic or necrotic change. One case shows calcification. At time of diagnosis, all cases (n=2) of non-extremity LMS have metastatic disease, and 3 cases (two of them are equivocal) of extremity LMS (n=11) are presented with metastatic disease. All 3 cases who survived over 5 years are those with lesions at soft tissue of extremity.

CONCLUSION: Most LMS presented as heterogeneous, macrolobulated, hypervascular mass. Smaller lesions might be homogeneous or hypovascular with no macrolobulation. Lesions might show cystic change, necrosis or calcification. Patients with LMS of extremity soft tissue without metastatic disease have better prognosis.

骨質石化症：三病例報告
Osteopetrosis: Three Cases Report

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INTRODUCTION: Osteopetrosis, also known as marble bone disease, chalk bones or Albers-schonberg's disease, is an extremely rare hereditary disorder, genetic condition of increased bone mass, which is caused by defects in osteoclast formation and function. Both autosomal recessive and autosomal dominant forms exist. Increased bone density causes sclerotic and thick pattern of bones and their abnormal structure results in them being both weak and brittle that may be prone to be fracture and infected and abnormality of blood cell formation.

CASE REPORT: We present three cases in our hospital. The first is a 1-year-old male infantile who was found diffuse increased density of bone in chest film in 2012. The second was a 46-year-old female adult suffering from bilateral femoral head fractures, the majority of complications because of the weakened bones, in 2007 and 2011 respectively. The pelvis film showed diffuse sclerosing density. They are often transverse fractures with multiple areas of callus formation and normal healing. The last case was 51-year-old female with family history of osteopetrosis suffered from chronic low back pain and right knee pain for several months.

DISCUSSION: Osteopetrosis is one of the sclerosing bone dysplasias. Many of the sclerosing bone dysplasias exhibit similar pathologic mechanisms and similar underlying genetic defects. It is important to differentiate these diseases via clinical and radiographic picture for us.

PT109-MS

附肢骨骼的漿細胞瘤：病例報告和文獻綜述
Plasmacytoma of Appendicular Skeleton: A Case Report and Literature Review

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INTRODUCTION: Plasma cell neoplasms can present as Solitary or multiple lytic lesions of bone. The most common bones involved are those with active hematopoiesis; the axial skeleton is more commonly involved. Disease in the distal appendicular skeleton below the knees or elbow is extremely rare.

CASE REPORT: The following is the case of a 39 year old female patient initial presenting right leg chronic pain with a palpable mass in the proximal tibia. Radiographic skeletal survey and biopsy proven the diagnosis of plasmacytoma.

DISCUSSION: The monoclonal gammopathies are a group of disorders associated with a monoclonal proliferation of plasma cell, typically producing a monoclonal immunoglobulin. The entities including monoclonal gammopathy of undetermined significance (MGUS), asymptomatic myeloma, symptomatic multiple myeloma, and solitary plasmacytoma of bone.

動靜脈畸形和靜脈栓塞的關係：病例報告

The Causal Relationship between the Arterio-Venous Malformation and the Venous Thrombosis: A Case Report

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INTRODUCTION: Although the arteriovenous malformation (AVM) often presented as a congenital entity, the venous thrombosis had been recognized as one of its risk factors or vice versa. Here, we present a case with both AVM and venous thrombosis and literature review of their associated factors.

CASE REPORT: A 19-year-old man came to our hospital because of shortness of breath. CT scan revealed pulmonary embolism with intraluminal filling defects in right anterior basal and left posterior basal segmental pulmonary arteries. Also, A pocket of contrast opacification is seen in left popliteal fossa with intraluminal thrombi and deep vein thrombosis in left distal popliteal vein. After thrombolysis with t-PA infusion and heparin and inferior vena cava filter implantation, he was discharged. The follow up angiography 4 months later showed a high-flow vascular malformation with arteriovenous shunting at left popliteal fossa, supplied by left popliteal artery with aneurysm formation. Therefore, the TAE was performed with coils and microcoils delivered.

DISCUSSION: Angiogenesis and endothelial activation are associated with formation of the arteriovenous malformation. The angiogenic factor related to the thrombosis may include tissue hypoxia, venous hypertension, and presence of the growth factors. The clot may provide a scaffold for malformation formation. Furthermore, the existence of arteriovenous malformation may promote the formation of deep vein thrombosis by hemodynamic turbulence. As in our case, the former seems more likely because the deep vein thrombosis of leg is distal to the popliteal AVM.

PT111-MS

少見的左上臂血管肉瘤在核磁共振與血管攝影之影像呈現：病例報告

A Rare Case of Left Upper Arm Cutaneous Angiosarcoma with MR and Angiographic Images: A Case Report

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INTRODUCTION: Cutaneous angiosarcoma is a very rare tumor arising from the vascular endothelial cells, accounting for less than 1% of all sarcomas. A rare case of left upper arm cutaneous angiosarcoma with MRI and angiographic study.

CASE REPORT: We reported a 60-year-old female with left breast cancer post modified radical mastectomy (MRM) and radiotherapy in 1989. The palpable mass in the inner side of left upper arm was noted for about 10 years. Erythematous rash with skin retraction was noted since one year ago. MRI revealed superficial cutaneous lesions with high T2 signal intensity, and angiography showed relatively hypovascularity & minimal tumor stain. She then received excisional biopsy, and the pathology reported well-differentiated angiosarcoma.

DISCUSSION: Most of the cutaneous angiosarcoma occurs in scalp and face. Post-irradiation cutaneous angiosarcoma at breast region also account for some cases. Most of the cases are directly diagnosed by clinical information and surgical pathologic proof without image survey. In this case, rare site of left upper arm cutaneous angiosarcoma with MRI and angiography presentation may offer clinicians further reference and image experience.

足底筋膜之組織化血栓：病例報告
Plantar Fascial Organized Thrombus: A Case Report

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INTRODUCTION: To described a rare manifestation of plantar fascial tumor with MR imaging (MRI) and pathological findings.

CASE REPORT: A 53-year-old man without systemic disease has developed a soft, non-tender and deep seated nodule in left forefoot without overlying skin change. He had a history of left knee sprain previously. Ultrasound showed a 1 cm-sized hypochoic lesion with internal debris and posterior wall enhancement. MRI revealed a nodule with partially ill-defined margin beneath the plantar fascia, which showed hypointensity on T1-weighted images, increased signal intensity on T2-weighted images, with partial dark signal at the periphery on gradient echo images, respectively. The differential diagnosis includes plantar fibroma, ganglion cyst and leiomyoma. Simple surgical excision was done and pathology revealed some well-formed blood vessels with organized thrombus formation, and proliferative fibroblasts in the thrombus.

CONCLUSION: MRI is useful in detecting affected compartments and distribution, evaluating the extent and signal characteristics of the plantar fascial lesion. Besides the plantar fibroma, hematoma or organized thrombus as a differential diagnosis in plantar tumor with prior trauma.

PT113-MS

髕骨之軟骨母細胞瘤：病例報告
Patellar Chondroblastoma: A Case Report

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INTRODUCTION: Chondroblastoma is a relatively rare and benign neoplasm of bone. It accounts for about 1% of all bone tumor cases. It tends to affect the epiphyseal ends of long bones, often in males during the first and second decades of life. However, the patella is an unusual location of chondroblastoma growth.

CASE REPORT: We report a case of patellar chondroblastoma in a 24-year-old male patient.

DISCUSSION: The X-ray and computer tomography pictures of this case are well-characterized, similar to those appearing in long bones. We also review literatures, revealing a high male-to-female ratio of patellar chondroblastoma. As seen in prior reports, the treatment for patellar chondroblastoma may be either patellectomy or curettage with bone graft. However, local recurrences after curettage and bone grafting occur in 11-25% of cases. In our case, the patient received curettage with bone graft. Thus it's necessary to keep continuous follow-up.

血管球腫瘤導致肩膀疼痛：病例報告

Glomus Tumor as a Cause of Shoulder Pain: A Case Report

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INTRODUCTION: Chronic shoulder pain has multifactorial etiology and should be carefully examined by a pain physician. Glomus tumors are small vascular tumors which are benign, but rarely occur. Approximately 80% of the tumors are located in the upper extremities, and more than 75% of these are located subungually. Many extradigit locating glomus tumors have been reported in various reports. Although pain is the major complaint of the patient glomus tumors are often overseen by pain physicians. Here, we report a case of glomus tumor which presented with chronic shoulder pain.

CASE REPORT: A 54-year-old man visited our pain clinic presenting with a 2-year history of right shoulder pain. He had been visited the clinic of neurology and rehabilitation, where myofascial pain was impressed. And no response to local injection of local anesthetics and steroid. The Lancinating pain was produced when being touched. A careful examination of ultrasonography over the painful area showed a 5.1 × 3.7 mm hypervascular hypoechoic nodule over junction of dermis and subcutaneous fat. Under impression of glomus tumor, local excision was performed. The pathology report also showed glomus tumor. After surgery, the patient was free of pain.

DISCUSSION: Glomus tumors were first described clinically by Wood in 1812 as “painful subcutaneous tubercles”. They are rare benign tumors originating from the neuromyoarterial glomus bodies of Masson. About 75% of them are found in the hands. The most common site is the distal phalanx, especially the unguis bed. They have been thought to be much less common in extradigital locations. This has resulted in long delays in diagnosis or in misdiagnosis of these lesions. Accurate and rapid diagnosis of glomus tumors is important to avoid lengthy treatment delays. Complete resection is the most definitive treatment and recurrence is rare.

PT115-MS

髖關節附近缺血性筋膜炎的電腦斷層表現：病例報告

CT Findings of Decubital Ischemic Fasciitis Around Hip: A Case Report

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INTRODUCTION: Decubital ischemic fasciitis also called atypical decubital fibroplasia or ischemic fasciitis is a rare pseudosarcomatous proliferation of atypical fibroblasts occurring predominantly in elderly and debilitated patients. The lesions occur in the deep subcutaneous tissue at pressure points or bony prominences.

CASE REPORT: Here we report a case of decubital ischemic fasciitis around right hip in a 59-year-old male who had a history of local blunt injury twenty years ago. Clinical presentations, computed tomography (CT) findings, and histopathology are described.

DISCUSSION: To our knowledge, the CT findings of decubital ischemic fasciitis have not been reported in the imaging literature and only few patients of decubital ischemic fasciitis have a history of local trauma. When a mass lesion involved subcutaneous tissue and iliotibial band, abutting but not invading the greater trochanter, decubital ischemic fasciitis should be considered in the differential diagnosis. Ischemic fasciitis is not inconsistent association with old age or debilitation. It is important to recognize this entity to prevent unnecessary interventions or overtreatment.

膝關節血管纖維瘤：病例報告
Angiofibroma of the Knee: A Case Report

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INTRODUCTION: Angiofibroma of the soft tissue is a rare disease entity only recently described in literature, but imaging features have not been well reported. We report one rare case occurring in the knee.

CASE REPORT: A 59-year-old man presented with a palpable mass in right medial knee that had slowly enlarged for three years. Plain film showed a soft tissue mass at right medial knee. On MRI, the mass was strongly hyperintense on T2WI and PDWI, minimally hyperintense to muscle on T1WI, and strong enhancement. He received wide excision after incisional biopsy revealed angiofibroma. Postoperative course was smooth and without recurrence at five month after surgery.

DISCUSSION: Fibroblastic neoplasms with abundant vascularization are categorized as angiofibroma, with the nasopharyngeal angiofibroma subtype previously well known. Angiofibroma of the soft tissue is only recognized recently. It is, in summary, a distinct fibrovascular soft tissue tumor with a benign clinical course, arising most commonly in the extremities of middle-aged adults, showing myxoid and hypervascular imaging characteristics, and adequately treated by local excision.

Oncogenic Osteomalacia 相關的 Phosphaturic Mesenchymal Tumor : 三病例報告
Oncogenic Osteomalacia Associated Phosphaturic Mesenchymal Tumor: Three Cases Report

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INTRODUCTION: Phosphaturic mesenchymal tumors (PMTs) are rare and mostly benign soft tissue or bone neoplasms frequently associated with phosphaturia and oncogenic osteomalacia. Secretion of fibroblast growth factor 23 (FGF23) cause this paraneoplastic syndrome. PMTs are typically seen in middle-aged adults with a scenario of a long standing hypophosphatemia, phosphaturia, and osteomalacia under presentation of general malaise and bone pain. Thus the patients are commonly transferred to nephrology department. PMTs mostly affect in the extremities and may be pathologically misdiagnosed as other mesenchymal tumors like giant cell tumor, hemangiopericytoma, chondroma, or mesenchymal chondrosarcoma. We present three cases showing hypophosphatemia, phosphaturia and osteomalacia for at least two years and finally a tumor over lower extremity was found. In addition, initial pathologically diagnosed as giant cell tumor or hemangiopericytoma are noted.

CASE REPORTS:

Case 1: A 41 year-old male was relative healthy, and about 2 years before, he felt weakness and diffuse bone pain with progressively shortened body height. Plain films of skull, pelvis, and extremities shows mixed osteoblastic and osteolytic changes, then was found hypophosphatemia, normal serum calcium, elevated alkaline phosphate, and high urine phosphate levels. There was no palpable mass. Under the impression of oncogenic osteomalacia, PET scans was done and showed a small area of FDG uptake over the right thigh. Further MRI showed a serpentine lesion between sartorius and vastus medialis of right thigh. Intermediate signal in T1, hyperintensity in T2, and heterogenous enhancement after Gadolinium injection, which showed a nonspecific image pattern. Wide excision was done and pathological report as PMT with focal hemangiopericytoma like pattern. Further follow up of serum and urine examinations with normalization are noted.

Case 2: A 25 year-old male was relative healthy, and about 2 years before, he felt progressive low back pain and unable to bend. He had been to several departments and was found osteoporosis. Lab data disclosed hypophosphatemia, and then he was transferred to nephrology department. Subsequent data showed normal serum calcium, elevated alkaline phosphate, and high urine phosphate levels. There was no palpable mass. Under the impression of oncogenic osteomalacia, PET scans was done and showed a focal FDG uptake over the right knee region. MRI showed a lobulated mass of right infrapatellar fatpad with maximal diameter about 4.4 cm with heterogenous low to intermediate signal in T1, heterogenous hyperintensity in T2, and heterogenous enhancement after Gadolinium injection, which showed a nonspecific image pattern. Wide excision was done and pathological report as hemangiopericytoma/ giant cell tumor at first. After discussion, pathologists revised the report to PMT. Further follow up of serum and urine examinations with normalization are noted.

Case 3: A 64 year-old female was relative healthy, and about 2 years before, she felt progressive low back pain and unable to bend. He had been to several departments and was found osteoporosis. Lab data disclosed hypophosphatemia, and then he was transferred to nephrology department. Subsequent data showed normal serum calcium, elevated alkaline phosphate, and high urine phosphate levels. There was no palpable mass. Under the impression of oncogenic osteomalacia, PET scans was done and showed a focal FDG uptake over the right knee region. MRI showed a lobulated mass involving bone marrow and cortex of right distal femoral metaphysis with maximal diameter about 3.9 cm and heterogenous low signal in T1, heterogenous hyperintensity in T2, and heterogenous enhancement after Gadolinium injection, which showed a nonspecific image pattern. Wide excision was done and pathological reported as PMT. Further follow up of serum and urine examinations with normalization are noted.

DISCUSSION: If a patient presents with a long term hypophosphatemia, phosphaturia and osteomalacia without other physiologic cause, oncogenic osteomalacia should be considered. Among the tumors considered in oncogenic osteomalacia, PMTs are the commonest associated tumor (2). Other tumors such as metastatic carcinomas, osteosarcoma, hemangioma of bone, sinonasal hemangiopericytoma have been reported. And the above pathological findings are easy distinguishable. The MRI findings in our three cases of PMTs showed a nonspecific image pattern indistinguishable from other fibrous or mesenchymal tumor: heterogenous appearance, low to Intermediate signal in T1, heterogenous hyperintensity in T2, and heterogenous enhancement after Gadolinium injection.

腰薦區巨大的表皮囊腫：病例報告

An Expansile Intraspinal Epidermoid Cyst of the Lumbosacral Region: A Case Report

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INTRODUCTION: Spinal epidermoid cysts are rare and slow-growing lesions. These lesions showed a wide variety of characteristics of the MRI. We report a case of an expansile epidermoid cyst in lumbosacral region. The lesion was seen in Intradural and extramedullary location. CT guided biopsy and drainage was performed. The histologic findings suggested an epidermoid cyst.

CASE REPORT: We report a 61 year old man who suffered from progressive lower back pain and legs weakness after a fall 6 months ago. Plain X-ray films of the spine showed a lobulated mass in the lumbosacral region. Bone destruction and remodeling were also noted. MRI showed a heterogeneous signal mass from upper lumbar to sacrum with 5th lumbar spine destruction. The tumor was shown by heterogeneous signal intensity on precontrast MRI images and rim enhancement on postcontrast MRI images. The histologic findings suggested an epidermoid cyst.

DISCUSSION: Spinal epidermoid cysts are rare and slow-growing benign lesions. Such the expansile lesion in our report is even fewer. Epidermoid cysts must be considered as the differential diagnosis of spinal mass lesions. However a wide variety of characteristics of the MRI make it difficult. Enhancement of the thin rims on gadolinium-enhanced MRI has been inconsistently described. Due to slow-growing, they can reach large sizes producing any symptoms and are inoperative. CT guided drainage may relieve the symptoms.

PT119-MS

股骨頸頸部類澱粉病變：病例報告

Femoral Neck and Head Amyloidosis: A Case Report

戴嘉裕

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INTRODUCTION: Amyloidosis deposition in osteoarticular region can be one of the musculoskeletal manifestations in end-stage renal failure patient under dialysis therapy. The radiology investigation, diagnostic challenges and histopathological findings are discussed.

CASE REPORT: A case of amyloidosis deposition at right femoral neck and head has past history of autosomal dominant polycystic kidney disease with end stage renal disease under hemodialysis therapy. The patient presented with insidious onset right hip and knee pain for a month. Plain film of hip joint showed suspicious osteolytic shadows over the superior aspect of right femoral neck. MRI study indicated amorphously heterogeneous T1 and T2 hyperintensity. Differential diagnosis included amyloidoma, plasmacytoma, enchondroma and so forth. Under the suspicion of pathological bony lesion, total hip arthroplasty was carried out. Histopathological report showed one well-defined lesion composed of amorphous eosinophilic amyloid-like deposition with focal apple-green birefringence under polarized light.

DISCUSSION: The differential diagnosis of osteolytic lesions in bone in patient underwent hemodialysis included multiple myeloma, metastases, Brown tumor due to hyperparathyroidism, subchondral degenerative cysts, infection or Waldenstrom macroglobulinemia. Rapid progression of disseminated osteoarticular amyloid deposition had been reported in case under dialysis therapy. Arthritic symptom and pathologic fracture followed by Juxta-articular amyloid deposition is common.

弗尼爾氏壞疽：病例報告
Fournier Gangrene: A Case Report

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INTRODUCTION: We described the imaging findings of a young-aged man with Fournier gangrene.

CASE REPORT: A 40-y-o male without past history of major systemic disease was investigated for right inguinal mass. Initial vital signs were stable without fever, and elevation of body temperature noted after hospitalization. To further investigate the cause of right inguinal mass, CT was ordered.

CT disclosed extensive inflammatory changes of soft tissues in lower abdomen and right inguinal region. Asymmetric fascial thickening and coexisting fluid collection extended from perineum and scrotal region to the inguinal region, thigh and lower abdominal wall also noted.

No definite evidence of subcutaneous emphysema found. So the diagnosis of Fournier gangrene was made.

DISCUSSION: Although the diagnosis of Fournier gangrenes is most commonly made clinically. With the increasing use of CT in the emergency setting, CT plays an important role in the early diagnosis and detailed evaluation of disease extent for further appropriate treatment.

PT121-PE

胎兒先天性胸腔畸形磁共振造影影像表現
Fetal MRI of Congenital Chest Malformations

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PURPOSE: To share the experience in fetal MRI of congenital chest malformations.

MATERIAL AND METHODS: From 2006 to 2011, 38 cases of fetal congenital chest malformations were found on routine prenatal US examination. The mothers were referred from the obstetric department for MRI evaluation to further define the lesion. MRI was performed in fetuses with suspected congenital chest lesions when US studies were equivocal. We used a 1.5-Tesla MR scanner (Twinspeed, GE Medical Systems, Milwaukee, WI) with a torso phased-array coil. The images were obtained with single-shot fast-spin echo sequence.

RESULT: MRI is able to demonstrate clearer images and more distinctive spatial anatomical relationship of the fetal congenital chest malformations. The most common congenital chest anomalies include congenital pulmonary airway malformation, bronchopulmonary sequestration, congenital lobar fluid overload, congenital diaphragmatic hernia and congenital pleural effusions. Less common diseases include chest wall lymphangioma, congenital bronchogenic cyst, esophageal duplication cyst, pulmonary hypoplasia or aplasia and bronchial atresia. We illustrate these congenital chest abnormalities seen at fetal MRI.

CONCLUSION: MRI is a useful tool in the investigation of fetal congenital chest malformations when US studies are equivocal.

地中海型貧血患者發生糖尿病併發症的臨床及影像學評估
Diabetes Mellitus in Patients with Thalassemia Major

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PURPOSE: Diabetes mellitus is a major endocrinopathy for patients with thalassemia major. Although diabetes mellitus is multifactorial, iron loading is its primary cause and its management poses a clinical challenge. Detecting the pre-diabetes stage is critical because clinical diabetes can potentially be reversed or prevented.

MATERIALS AND METHODS: Patients with thalassemia major who received regular blood transfusion therapy from 1994 to 2010 were evaluated for the incidence of diabetes mellitus and glucose dysregulation. The association between patients' clinical, biochemical, and image parameters was also evaluated.

RESULTS: The patients with diabetes were significantly older, had higher ferritin levels, a smaller pancreas volume, and lower cardiac T2* values than the patients without diabetes. The pancreatic T2* values were higher in the patients without diabetes, but the difference was not statistically significant. The liver iron concentration did not differ between the patients with and without diabetes. The prevalence of hepatitis C infection and hypogonadism was also higher in the patients with diabetes. In the patients without diabetes, the cardiac T2* values were higher in patients with normal fasting glucose levels ($p=0.03$), and the homeostasis model assessment of insulin resistance level was associated with hepatitis C infection ($p=0.024$, $r=0.32$) and hypogonadism ($p=0.034$, $r=0.301$).

CONCLUSION: Fasting glucose and insulin levels were appropriate screening tools for evaluating glucose dysregulation and complemented the MRI findings in patients with thalassemia major. Diabetes in thalassemia is usually a tip of the iceberg of multisystemic involvement by iron overload. Cardiac T2* values and pancreas volumes were significant predictors of diabetes mellitus in those patients.

青春期前兒童之脂肪激素與體脂肪分布關係

Relationship between Adipokines and Adiposity in Prepubertal Children

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PURPOSE: Childhood obesity is a growing health problem worldwide. Increasing evidence indicated that excess adiposity is linked to low-grade inflammation, insulin resistance and adipocyte dysfunction. The aim of this study was to investigate the relationship between adipokines and adiposity in prepubertal children.

MATERIALS AND METHODS: This prospective study was approved by the local IRB. Prepubertal healthy children aged 7-10 years were enrolled ($n=27$). All measurements were performed after an overnight fast for at least 8 hours. Body composition measurements were performed using DEXA (Delphi A, Hologic) with software adapted for children. Abdominal images were obtained on a 3T MR scanner (Verio, Siemens) and volume of subcutaneous (SAT) and visceral fat (VAT) were measured. Plasma adiponectin, leptin, CRP, sugar and insulin were measured. Insulin resistance was assessed using homeostasis model assessment (HOMA-IR).

RESULTS: The mean levels of leptin, adiponectin, HOMA-IR and CRP were 12.2 ± 10.1 ng/mL, 19.0 ± 9.4 ug/mL, 0.8 ± 0.7 and 1.8 ± 2.9 mg/dL, respectively. Plasma leptin levels were positively correlated with total body fat ($R^2=0.393$, $P=0.0005$), VAT ($R^2=0.351$, $P=0.0011$), SAT ($R^2=0.334$, $P=0.0016$), HOMA-IR ($R^2=0.341$, $P=0.0014$) and CRP levels ($R^2=0.392$, $P=0.0005$). Adiponectin levels were not correlated with total body fat, VAT, SAT, HOMA index and CRP levels ($P > 0.05$).

CONCLUSION: These data suggest that leptin concentrations but not adiponectin levels are strongly associated with adipose accumulation in both subcutaneous and visceral depots and also closely related to inflammatory status and insulin resistance. Therefore, it may act as a biomarker for assessing obesity complications in children.

腎外 Rhabdoid Tumor 在新生兒的影像學表現：病例報告
Imaging Features of Extrarenal, Disseminated Rhabdoid Tumor in a Newborn: A Case Report

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INTRODUCTION: Rhabdoid tumor (RT) is a highly aggressive malignancy, which occurs extremely in young children, infants, or fetuses. Renal and intra-cranial involvement is the most common presentation of rhabdoid tumor, although it can be found in several locations.

CASE REPORT: We present a newborn with extrarenal, disseminated, rhabdoid tumor confirmed by tissue proof. The imaging features of computed tomography (CT) and magnetic resonance imaging (MRI) will be demonstrated.

DISCUSSION: In young children of malignant renal tumor, image evaluation is crucial tools of staging and detection for metastasis. The differential diagnosis includes mesoblastic nephroma, Wilm's tumor, renal cell carcinoma, clear cell sarcoma, and others.

Garre 氏骨髓炎青少年的三維齒科電腦斷層
Three-dimensional Dental CT in an Adolescent with Garre's Osteomyelitis: A Case Report

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INTRODUCTION: Garre's osteomyelitis is a type of chronic osteomyelitis also called proliferative periostitis, periostitis ossificans, Garre's sclerosing osteomyelitis, and chronic osteomyelitis with proliferative periostitis. It is an uncommon disease and usually affects the mandible and results in a hard swelling over the jaw, producing facial asymmetry with little or no pain. It is associated with a low grade infection, which may be due to dental caries. In the young, there is still considerable activity of osteoblastic cells in the periosteum, causing, therefore, a condensation of cortical bone rather than a pure osteolytic process.

CASE REPORT: Herein we report an adolescent with such disease affecting the left body of his mandible. The three-dimensional (3D) dental CT scan was arranged by the on duty otolaryngologist and it showed the mixed osteolytic and sclerotic lesion with periosteal reactions and some cortical disruptions, more in its buccal aspect.

DISCUSSION: The origin of the infection was the left mandibular first premolar tooth (#34) after the throughout clinical examination by the consulted dentist. He received the endodontic treatment of the affected tooth and low-dose oral antibiotics for 1 month.

E-thrombosis 發生於孩童、由於長時間固定姿勢產生之深部靜脈血栓：病例報告
E-thrombosis - Prolonged Immobility Associated Deep Vein Thrombosis in a Child:
A Case Report

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INTRODUCTION: "E-thrombosis" denotes venous thromboembolism occurring from protracted seated immobility at computer. Among current literature, few report e-thrombosis in pediatric group. We demonstrate MRI findings of a case with deep vein thrombosis and review current literature.

CASE REPORT: We report a 13-year-old boy presented with pain and swelling of left lower extremity. D-dimer level is elevated. Survey for thrombophilia was normal. He had no family history of thromboembolic event; however, he spent hours sitting at computer for a period of time. The MR venography showed thrombosis of the entire deep vein of left lower extremity. Tc-99m MAA lung perfusion scan revealed no perfusion defect. The child received Enoxaparin 5 mg injection for two weeks, and then kept oral Warfarin therapy.

DISCUSSION: Prolonged immobility caused deep vein thrombosis is not uncommon in adult patients, but seldom reported in the pediatric group. Since most fatal pulmonary embolism result from lower limb emboli, diagnosis of deep vein thrombosis should not be underestimated. Contrast venography is the standard modality for diagnosing deep vein thrombosis. Compression ultrasonography plays an important role in initial diagnosis. MR venography is as accurate as contrast venography for the diagnosis of DVT. It is an excellent substitution of contrast venography if the patient has allergy to iodinated contrast media.

CONCLUSION: MR venography is a useful diagnostic tool for children with suspicious E-thrombosis.

PT127-ER

胸部鈍傷導致心臟或下腔靜脈受損：六病例報告
Blunt Chest Trauma Associated with Cardiac or Inferior Vena Cava: Six Cases Report

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INTRODUCTION: The mortality rate of blunt chest trauma is significantly high if the injury is associated with cardiac or inferior vena cava rupture.

CASE REPORT: There are 6 patients presented with blunt chest trauma which is associated with cardiac or inferior vena cava injuries from 2012-2013 in our hospital.

DISCUSSION: Due to the promotion of emergency medicine and radiologic technology, more and more patient suffered from chest trauma with cardiac or inferior vena cava injuries can received image study. In this cases report, we reviewed the clinical data and radiographic presentations. To recognize the injury of cardiac or inferior vena cava in patient with blunt chest trauma may affect the treatment planning.

少見的成人寰椎樞椎：病例報告

Traumatic Atlantoaxial Rotatory Dislocation in an Adult: A Case Report

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INTRODUCTION: The traumatic atlantoaxial rotatory dislocation (TAARD) is very rare in adult and almost occurs in patients with ligamentous laxity such as Marfan's syndrome, Down's syndrome or in pediatric groups. There is a considerable delay diagnostic rate in daily practice of ER doctors because neither neurological deficit nor significant findings on routine plain films could be found in some cases who suffered from TAARD. Computer tomography is mandatory for a correct evaluation of C1-C2 complex.

CASE REPORT: The case we present is an 88-year-old woman suffering from neck pain after falling down to ground from a chair is rushed to our emergency department at midnight. TAARD had not been recognized until reformatted coronal images of CT scan were finished on the next day morning.

DISCUSSION: A Halo-Vest Fixation was then applied to the patient promptly after correct diagnosis of TAARD. The patient was treated successfully and discharged two days later.

國內透視攝影暨介入診療之醫療曝露調查

Survey of Medical Exposures from Fluoroscopy and Interventional Procedures in Taiwan

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PURPOSE: This survey was designed to collect medical exposure data and basic information of the fluoroscopy and interventional equipment and procedures in Taiwan.

MATERIALS AND METHODS: 448 questionnaires, one for each fluoroscopic unit, were sent to 201 hospitals. The age, type of image receptors, usages, and the definition of reference points were included in the questionnaires. Fluoroscopy time and displayed values of dose-area-product (DAP) and/or cumulative dose (CD) of 62 procedures were also included.

RESULTS: 344 questionnaires were returned from 133 hospitals. The median age of the fluoroscopic systems was 7 years old. 213 units (62%) were equipped with image intensifiers, 101 units (29%) were with flat panel detectors, and the number of unknown was 30. 161 systems (47%) were mainly used for nonvascular fluoroscopic procedures, 88 (26%) were for cardiac procedures, and 71 (21%) were for non-cardiac vascular procedures. There were 124 units (36%) had DAP display and 120 units (35%) had CD display. The fluoroscopy time of 32 procedures and DAP and CD of six procedures were reported. Larger variations in fluoroscopy time DAP and CD was observed for most of the procedures, as comparing to literatures. The median effective dose for angioplasty, PTCA, embolization, PTCD, nephrostomy, and visceral angiography were 3.9, 41.3, 60.2, 4.7, 2.3, and 38.7 mSv, respectively.

CONCLUSION: The basic information and exposure data of fluoroscopy and interventional systems and procedures were analyzed in this study. Large variations in fluoroscopy time DAP and CD was observed for most of the procedures. It implied that more efforts such as training courses, on-site measurements, and/or QA program should be conducted in the future.

電腦斷層掃描儀自動管電流調控系統對輻射劑量調降的現況調查研究 Evaluation of Automatic Tube Current Modulation in CT: A Nationwide Survey

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PURPOSE: This study aims to survey and investigate the impact of using the current use of automatic tube current modulation (ATCM) in clinical applications on image quality and radiation dose.

MATERIALS AND METHODS: CT scanners which used clinical adult abdominal scanning protocols were surveyed nationwide. If ATCM was clinically used, the mAs of an average-weight patient's mid-liver image was recorded to calculate the appropriate volumetric computed tomography dose index (CTDI_{vol} directly. The CTDI_{vol} abdominal dose in Taiwan. Additionally, a custom ATCM phantom was designed to survey the radiation dose and image quality for CT scanners using ATCM. After CT scanning, the recorded CTDI_{vol} investigated image quality, were compared for turning-on and turning-off ATCM in the same CT scanner). If ATCM was not applied, CTDI_{vol} were recorded for abdominal scanning represented the average clinical adult and dose-length product (DLP) values, and investigated image quality, were compared for turning-on and turning-off ATCM in the same CT scanner.

RESULTS: Analyses of survey data showed a significant dose decrease for diagnostic CT scanners between with using ATCM (12 ± 4 mGy) and without using ATCM (15 ± 5 mGy). Evaluations of the custom phantom showed no significant difference of CTDI_{vol} turning-on and turning-off ATCM.

CONCLUSION: The use of ATCM effectively reduces dose for diagnostic CT scanners from a nationwide view. The custom ATCM phantom was suitable for testing ATCM functions.

PT131-IT

使用擴散張量影像進行丘腦前核之分核：CSD 方法 vs 傳統擴散張量 Segmentation of Anterior Thalamic Nucleus in DTI Study: Comparison of CSD-based Method and Conventional DT Model

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PURPOSE: To compare constrained spherical deconvolution (CSD) based method with conventional diffusion tensor (DT) model in localization of the anterior thalamic nucleus (AN) and the fractional anisotropy (FA).

MATERIALS AND METHODS: 8 normal volunteers were enrolled. The MR-DT imaging was applied on a 3T scanner. Images were registered to minimize the eddy current-induced distortion. Fiber-tracking was performed using either conventional DT model with deterministic streamlines method and CSD-based technique with probabilistic streamlines method. AN was defined using the indirect differentiation method which requires two deterministic seeds for propagation of fibers: One was placed at the mammillary body, and the other was placed at the proximal end of the anterior limb of the internal capsule. The intersected area in the thalamus by the derived tracking fibers was defined as the region of AN.

RESULTS: Although the ascending fibers were expected to go through the AN along the mammillothalamic tract perpendicularly, the derived fibers from conventional DT model crossed the level of the AN with an oblique direction resulting in missed identification of the AN. In contrast, better consistence was shown using CSD method. As to quantitative measurements of fractional anisotropy in the AN, significant decrease of the error (from 11.99% to 4.83% error) was observed using CSD method.

CONCLUSION: Our results showed the advantage of improved localization of AN with the use of CSD-based tractography. In addition, quantification of FA in AN region appeared to be more stable with CSD method as compared to DT model.

通用擴散波數取樣磁振造影定量免腦發育

New Insights into Rabbit Brain Development using Generalized Q-Sampling MRI

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PURPOSE: To characterize the changes of quantitative diffusion indices in the developing rabbit brains using generalized q-sampling imaging (GQI).

MATERIALS AND METHODS: Five healthy New Zealand rabbits with ages from 4 to 40 weeks were scanned on a 1.5T MRI system which used double loop array coils for RF reception and two slab scans is used to obtain whole brain images. For each slab, diffusion weighted images (DWI) were acquired using 2D echo planar imaging (EPI) sequence with 12 diffusion-encoding directions and multiple q sampling. The diffusion sensitivity (b values) was from 0 to 2,000s/mm², and the scan time for each slab was 42 minutes. Tractography and several diffusion indices, normalized quantitative anisotropy (NQA), generalized fractional anisotropy (GFA), and isotropic value of the ODF (ISO) of hippocampus, corpus callosum, and olfactory tract were analyzed using DSI studio. The changes of the diffusion indices across the ages were compared and discussed.

RESULTS: It was observed that the GFA and NQA of hippocampus and corpus callosum increased with age. The ISO of corpus callosum decreased with ages, and there is no significant change in the ISO of hippocampus with age. The changes of GFA and NQA implied a more restrictive diffusion as the myelination of neural fiber greatly take place during the maturation period.

CONCLUSION: Our results demonstrated that both tractography and GQI diffusion indices revealed the major white/gray matter tracts change during maturation, which could be a potential tool for neuroscience investigations, such as revealing fiber tract pruning during development, which may be important targets for in vivo human studies.

比較自由與限制行動大鼠之錳離子增強功能性磁振造影

Comparison of Functional Brain Mapping in Freely Behaving and Restricted Rats using Manganese-enhanced MRI

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PURPOSE: To compare the functional brain mapping between freely behaving and restricted rats by manganese-enhanced MRI (MEMRI) method.

MATERIAL AND METHODS: MnCl₂ was given, 30 mM in 10 μl, directly into primary motor cortex (M1) of left brain in 12 adult Wistar rats by stereotaxic instrument and microinjection systems. The injection rate was 0.16 μl/min and total injection time was 63 min. Rats were separated into two groups, and 6 rats were restricted within a small cage and 6 were freely behaving rats. All rats were scanned three days after MnCl₂ administration.

The experiment was performed on 1.5T MRI (Sonata, Siemens, Germany). Two imaging sequences were performed to acquire T1W images and R1 mapping. To highlight the activity-related functional enhancement between freely behaving and restricted rats, the averaged Mn²⁺-enhanced T1WIs in the restricted group were subtracted from that in the freely behaving group after coregistration. Voxel-based t-value and p-value mapping were implemented to provide statistical difference between two groups.

RESULTS: In the restricted group, most of the cortical enhancement was localized in the left M1 area in the freely behaving group the enhancement extended to right M1 and left thalamic regions. To localize the activity-related areas, R1 mapping was made. Comparing to restricted group, the R1 mapping showed the enhancement extended to right M1 and left thalamic regions in freely behaving group. Subtracted images, voxel-based statistical t-value mapping and p-value mapping between two groups showed additional enhancement concentrated in the both sides of M1 and left thalamic regions.

CONCLUSION: We have mapped the motor cortex using the MEMRI, and have shown the difference of the manganese enhanced cortical and thalamic regions between freely behaving and restricted rats.

使用軟組織假體評估乳房攝影中彈性壓迫板之壓迫厚度

Investigation of Compressed Thickness of the Flexible Paddle Using a Soft-tissue-equivalent Phantom in Mammography

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PURPOSE: Many women have been experienced discomfort during compression procedure in mammography. The flexible paddle was therefore designed for reducing this discomfort during imaging. The purpose of this study is the investigation of compressed thickness of the flexible paddle using a soft-tissue-equivalent phantom in mammography.

MATERIALS AND METHODS: A digital mammographic system (Novation, Siemens) with a flexible paddle was used in this study. A 5-cm-thick Bolus phantom and a 5-cm-thick PMMA phantom were used for the assessments of compressed thickness. The compression forces of 0-200 N and 0-100 N were applied to the Bolus phantom and the PMMA phantom, respectively. The thicknesses of both phantoms for various compression forces were recorded and compared.

RESULTS: Results from this study show that the displayed thicknesses ranged from 5 to 3.9 cm for the PMMA phantom and ranged from 5 to 2.5 cm for the Bolus phantom. For the same compression force, the displayed thickness of the PMMA phantom was slightly greater than the displayed thickness of the Bolus phantom. The maximum difference of displayed thickness was 0.2 cm. For the compression force greater than 180 N, the displayed thickness of the Bolus phantom was 2.5 cm.

CONCLUSION: The Bolus phantom is suitable for the measurements of compressed thickness of the flexible paddle during mammographic procedure. The application of flexible paddle with a very high compression force (> 180 N) may not be beneficial in mammography due to the fact that the bolus phantom keeps constant thickness for the additional force.

PT135-IT

應用 CDMAM 假體與 Bolus 材料評估乳房攝影之影像品質

The Investigation of Mammographic Image Quality Using the CDMAM Phantom and Bolus Material

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PURPOSE: The clinically used image quality testing phantoms in mammography are rigid construction. Therefore, these phantoms cannot be deformed during the compression procedure. To develop a flexible image quality testing phantom in mammography, the purpose of this study is the investigation of image quality using the CDMAM phantom with 4-cm Bolus material.

MATERIALS AND METHODS: A digital mammographic system (Novation, Siemens) with the anode/filter combination of Mo/Mo was used in this study. The images were acquired using the CDMAM phantom with 4-cm Bolus material. The inverse image quality factor (IQF_{inv}) for each mammogram was determined using the minimum visible thicknesses for 0.1, 0.25, 0.5 and 1 mm detail diameters.

RESULTS: All the threshold thicknesses of the 0.1, 0.25, 0.5 and 1 mm detail diameter measured in this study were thinner than the acceptable limit values recommended from the European protocol. For the CDMAM phantom with 4-cm Bolus material, the IQF_{inv} values ranged from 482 to 491 $(\mu\text{m} * \text{mm})^{-1}$. For the acceptable limit values recommended from European protocol, the IQF_{inv} value was 237 $(\mu\text{m} * \text{mm})^{-1}$.

CONCLUSION: The threshold thickness of each detail diameter measured from the CDMAM phantom with 4-cm Bolus material is superior to that recommended in the European protocol. The Bolus material may be suitable for the development of a flexible image quality testing phantom in mammography.

應用於 PET/CT 之新型時間活度曲線評估方法運用熱發光劑量計量測：蒙地卡羅模擬研究
A Novel Time Activity Curve Estimation Method by Using TLD Measurement in PET/CT: A Monte Carlo Study

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PURPOSE: There are a growing number of patients undergoing nuclear medicine examination each year and dose estimation becomes a very important issue. The time-activity curves (TAC) of all source organs are required before one can estimate patient-specific body dose during the whole treatment period. However, TAC is known to be difficult to obtain for each individual. The purpose of this paper is to propose a patient-specific dose estimation methods from the dose measured outside the body without any TAC information.

MATERIALS AND METHODS: The method involves two steps. First, to compute the S values on the body surface for each source organ based on nuclear image using Monte Carlo simulation. Second, to measure the dose externally from the TLD placed on the body surface during nuclear examination. Since the doses in TLD are contributed from all source organs, they can be expressed by simultaneous equations with the S values as known variables and the cumulative activities of source organs unknown. Solving the simultaneous equations, the cumulative activities of all source organs can be obtained and subsequently the total body dose calculated. An ORNL mathematical phantom was used to validate this method. The dynamic activity distribution of each source organ obtained from MIRD dose estimate **REPORT 19** was used in ORNL phantom. Eight simulations were performed at 15min, 30min, 45min, 60min, 120min, 180min, 240min, and 300min after intravenous administration of 18F-FDG. Numerous TLDs were placed on the surface nearest to each source organ. After each simulation, the TLD reading and S values were used to compute the cumulated activity of each organ.

Results and Discussion: It can be seen that the dose rate of each organ computed from simulated and estimated TAC are quite consistent. The Percent sum of squared errors (PSSE) at these time are 5.91%, 10.7%, 11.3%, 6.75%, 9.44%, 6.53%, 7.78%, and 3.71%, respectively. The PSSE of the dose rate is about 30% smaller than that of the activity.

CONCLUSION: Preliminary results on ORNL phantom show achievement and effectiveness of this method.

甲狀腺髓狀癌的灰階超音波特徵與病理之對照

Gray-scale Ultrasonographic Characteristics of Medullary Thyroid Carcinoma with Sonographic-Pathologic Correlation

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PURPOSE: To investigate the gray-scale sonographic manifestations of medullary thyroid carcinoma and perform sonographic-pathologic correlation.

MATERIALS AND METHODS: From Jan, 2000 to Aug, 2013, a total of 12 patients with medullary thyroid carcinoma (MTC) evident by single lobe thyroidectomy or bilateral thyroidectomy underwent pre-operative sonogram examinations (7 male, 5 female, mean age 58.2; ranging 31-84). Sonographic features and pathologic slides of the 12 MTC cases were reanalyzed retrospectively on the basis of independent reviews by two experienced radiologists and two pathologists. The gray-scale sonographic analysis inspected lesion size and sonographic features, included echogenicity, homogeneity, shape, margin, presence of halo (encapsulation), intranodular calcifications, and extrathyroid extension. On the pathologic assessment, amyloid/fibrous distributions in the 12 MTCs were classified into 3 types: type I is mild distribution, type II is moderate distribution, and type III is marked distribution. We performed sonographic-pathologic correlation based on the 12 MTC cases with emphases on size, encapsulation, lesion texture, calcifications, and extrathyroid extension.

RESULTS: The size of the 12 MTC cases ranged from 1.0 to 5.5 cm (mean, 2.9 cm) on sonograms and 0.8 to 4.5 cm (mean, 2.4 cm) by pathological analyses, respectively. The difference of mean sizes between sonographic and pathologic measurements was not statistically significance ($P=0.3625$, unpaired t test). On sonography, 9 (75%) of 12 MTCs presented oval or round shapes. Only 3 (25%) MTCs were in lobulated or irregular shapes. Circumscribed margins were noted in 4 (33.3%) of 12 MTCs. Furthermore, 7 (58.3%) MTCs showed indistinct margins and 1 (8.3%) MTC had a microlobulated margin. According to the sonographic-pathologic correlation of the 12 MTCs, the sensitivity, specificity and accuracy varied in the detection of encapsulation (62.5%/75%/66.7%), intranodular calcifications (100%/100%/100%) and extrathyroid extension (100%/55.6%/66.7%). Seven (58.3%) of 12 MTCs showed intranodular calcifications; 3 (25%) MTCs had calcifications with a maximum > 10 and the other 4 (33.3%) MTCs with a maximum < 10. Two (16.7%) MTCs had a solitary macrocalcification. Microscopic examinations showed that 5 (41.7%) of 12 MTCs had type I amyloid/fibrous distribution, and 7 (58.3%) MTCs showed type II or type III distribution. According to sonographic-pathologic correlations, 5 MTCs with type I amyloid/fibrous distribution, 3 MTCs showed slightly heterogeneous hypoechoic features, 1 MTC appeared slightly heterogeneous isoechoic, and 1 MTC displayed homogeneous hypoechoic. Six of 7 MTCs in type II or type III distribution showed heterogeneous hypoechoic or heterogeneous marked hypoechoic features; only one of 7 MTCs looked slightly heterogeneous hypoechoic.

CONCLUSION: All MTCs were ≥ 10 mm on sonograms. Most MTCs were in oval or round shapes with indistinct margins. Gray-scale ultrasonography provided only a limited accuracy of MTC detection of encapsulation and extrathyroid extension but showed 100% sensitivity, specificity and accuracy of intranodular calcification detection. MTCs with type II and type III amyloid/fibrous tissue tended to be more heterogeneous and more hypoechoic than those with type I.

評估不同乳房假體材質在乳房攝影中對 PMMA 之等效厚度
Investigation of Equivalent Thickness of PMMA slabs for different Breast Phantom Materials in Mammography

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PURPOSE: The study of the glandularity of breast is an important issue in mammography. To determine glandularity of breast, various breast phantom materials have to be used in the acquisition of imaging parameters. Using PMMA slabs to replace the various breast phantom materials may minimize the complexity of these mammographic studies. The purpose of this study is the investigation of equivalent thicknesses of PMMA slab for different breast phantom materials in mammography.

MATERIALS AND METHODS: The PMMA and breast phantoms with glandularity of 0%, 47% and 100% were imaged. The tube loading, thickness, tube voltage, and target/filter combination for each mammogram were collected. These imaging parameters were used for estimation of the equivalent thickness of PMMA. The thickness of PMMA slab that producing the same exposure factors as breast phantom materials was calculated.

RESULTS: Results from this study show that the equivalent thickness of PMMA linearly increased with the increasing thickness of breast phantom material. For the 4.5 cm breast phantom with glandularity of 0%, 47%, and 100%, the estimated equivalent thickness of PMMA were 5.68 ± 0.11 , 4.76 ± 0.09 , and 3.83 ± 0.30 cm, respectively. For the breast phantom material with lower glandularity, the estimated equivalent thickness of PMMA is thicker.

CONCLUSION: The equivalent thicknesses of PMMA slab for different breast phantom materials were determined. Results from this study show that various breast phantom materials can be simulated by using different thicknesses of PMMA slab.

PT139-OT

以系統性文獻回顧探討降低磁振造影患者焦慮介入措施之應用
Reduction of Anxiety Undergoing Magnetic Resonance Imaging: A Systematic Review of Interventions

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PURPOSE: Magnetic resonance (MR) imaging is a non-invasive examination, but patients undergoing MR imaging scans can experience moderate to high levels of anxiety and the bad experience may lead to inducing claustrophobia. The aim of this system review was to determine what interventions effective in respect to patient anxiety for MR imaging examinations.

MATERIALS AND METHODS: This study used a systematic review method and was conducted by electronic searching for entries in the Medline, PubMed, Cochrane Library, Ovid, CEPS and Google Scholar. The search focused only on articles published between 2000 and 2013 using the keywords "anxiety", "magnetic resonance imaging", "patient education" and "multimedia". Relevant articles were assessed by 2 independent reviewers. The authors selected the 9 articles that contained either a randomized clinical trial (RCT) or controlled clinical trial (CCT).

RESULTS: 6 different methods out of these 9 articles, including written information, booklet, multimedia, interview, music and relaxation techniques, could reduce anxiety, improve the knowledge and increase the comprehension while undergoing MR imaging. Two studies indicated that well-informed patients were experience less anxiety and more satisfied, and one study had shown that fewer patients had images with motion artifacts.

CONCLUSION: This study recommends using interventions to decrease anxiety, and increase knowledge, comprehension, and satisfaction for the patients who undergo MR imaging. Reviewing the quality of research methods among studies offers a consideration in the future research design studies.

雲端倉儲管理系統於心導管室之應用：以一區域醫院為例**Application of a Cloud-Based Inventory Management System in the Cardiac Catheterization Room: A Case of Regional Hospital in Southern Taiwan**

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PURPOSE: The variety of medical material supplies is essential due to the heterogeneity of patient. The price of cardiac catheterization materials is high, so materials are consigned for the storage is limited. The complexity of items is another reason. With rising demand, the establishment of a just-in-time hospital inventory management system is necessary to improve quality and efficiency of services.

MATERIAL AND METHODS: The development of a hospital inventory management system is based on barcode technology. Material barcode database is created at first with stock levels. While undergoing the catheterization, the barcode scanner facilitates listing usage of materials for each patient. The system also shortens the time of ordering by automatic calculating the usage of each item and compiling orders for the same company.

RESULT: With this hospital inventory management system, average replenishment time reduce by one work day. Consumed materials will be restocked on the next day. For the suppliers, the benefit is to lessen turnover rate. Computerized information not only reduces error rate, but also provide real-time inventory management data, which decreases overtime hours by 20% and reduces personnel costs.

CONCLUSION: The hospital inventory management system synchronizes the inventory management data. It provides real-time consumption data to the suppliers, which substantially improve the overall efficiency and accuracy. Units which have to manage consigned materials are recommended to apply the inventory management system.

PT141-OT

游離脾的影像學發現：病例報告**Radiologic Findings Of Wandering Spleen: A Case Report**

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INTRODUCTION: Wandering spleen, a rare condition involving the absence or weakening of the ligaments that secure the spleen over the left upper abdomen, is found most commonly in children and women of reproductive age. We present a case with initial symptoms of intermittent abdominal pain, where subsequent ultrasound and computed tomography (CT) studies revealed a wandering spleen with relatively low enhancement on CT.

CASE REPORT: A 5-year-old girl presented to emergency department with severe abdominal pain with vomiting for 1 day. She reported having intermittent abdominal pain for about 1 month. Physical examination revealed mild abdominal tenderness and a palpable mass which extended to umbilicus level of abdomen. Abdominal ultrasound showed a wandering spleen with splenomegaly, while splenic ischemia was additionally shown on CT. Pediatric surgeon was consulted, but her parents refused operation despite being informed of possibly serious morbidities. She was discharged for out-patient follow-up.

DISCUSSION: Clinical manifestation of wandering spleen includes palpable abdominal mass or acute abdominal pain due to torsion, but many patients may remain asymptomatic. Acute torsion of spleen often presents as acute abdomen and may cause vascular congestion, infarction, and even gangrene. Ultrasound scan is the initial study of choice, but CT is the preferred study for diagnosing a wandering spleen when torsion is suspected. The treatment of choice is splenectomy in asymptomatic or even symptomatic patients without the presence of splenic necrosis. If splenic necrosis is present, a splenectomy usually is required.

脾臟硬化性血管結節轉型之電腦斷層及病理表現
A Case of Sclerosing Angiomatoid Nodular Transformation of the Spleen
Correlations between CT and Histopathologic Findings

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INTRODUCTION: Sclerosing angiomatoid nodular transformation (SANT) is a rare benign vascular lesion of the spleen. Although SANT may have some specific radiological features, a definitive diagnosis of SANT on computed tomography (CT) or magnetic resonance imaging (MRI) remains difficult. Immunohistochemistry is the only way to confirm the diagnosis of SANT.

CASE REPORT: We present a new case of SANT of spleen in a 40-year-old woman with thalassemia. Multiple ill-defined lobulated poor-enhanced hypodense masses about 7.9cm in largest length in spleen were noted incidentally on abdominal CT. Besides, several calcified nodules over omentum and right lower lung were also noted. She underwent an uncomplicated laparotomic splenectomy. The specimen was sent for histopathologic examination and confirmed the diagnosis.

DISCUSSION: In current, there is still no reliable diagnostic radiological feature for differentiation SANT from other splenic tumors or malignant lesions. The diagnosis of SANT should be considered in any patient presenting with a splenic lesion that contains an angiomatoid or inflammatory component.

PT143-OT

一復發性口腔癌患者去氧葡萄糖正子電腦斷層影像上發現對比劑顯影胸部電腦斷層
攝影未發現之心臟轉移病灶
FDG PET/CT Identified Cardiac Metastases which were not Depicted by
Contrast-Enhanced Chest CT in a Patient of Recurrent Buccal Cancer

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INTRODUCTION: Although tumor recurrence, distant metastasis and even second primary malignancy are common in treated head and neck cancer patients, cardiac metastasis is an uncommon complication. Vice versa, cardiac metastasis is rare in oncologic patients and only few had been reported in head and neck cancer patients in literature. We presented a FDG PET/CT image for restaging in a man of recurrent buccal cancer, which showed multiple distant metastases including the heart. Subsequent contrast-enhanced chest CT did not identify cardiac metastatic foci. We discussed the possible explanation and clinical relevance.

CASE REPORT: A 63 year-old gentleman who had underwent operation for buccal cancer years 4 ago suffered from tumor recurrence. He received concurrent chemoradiotherapy thereafter. Several months later after treatment finished, oral pain and general weakness developed. He was referred for FDG PET/CT for restaging due to clinically suspicious recurrence. In addition to a bulky hypermetabolic tumor suggestive of local recurrence in oral cavity, whole body FDG PET/CT image also depicted multifocal distant metastases in both lungs, heart (LV and interventricular septum), multiple muscles and inside abdominal cavity. Subsequent contrast-enhanced chest CT did not depict cardiac metastasis. The patient underwent radiotherapy to recurrent tumor and systemic chemotherapy. It had not been long before cardiac tamponade developed later. Although biopsy was not attempted due to poor patient condition and high risk, cardiac metastasis could be reasonably ascertained by positive cytology of pericardial effusion.

DISCUSSION: Even though rare, cardiac metastasis can lead to fatal complication including cardiac tamponade, embolization, arrhythmia or sudden death depending on location. Any cardiac metastasis should be managed promptly and carefully according to individual condition. FDG PET/CT has been applied widely in the staging, monitoring response to treatment, detection of recurrence and restaging of oncologic patients. As a whole body tool, depicting distant metastasis including the heart not only accurately defines the disease extent but also results in change in management decision. Even if FDG uptake by myocardium is not uncommon, metastatic foci or physiologic uptake in heart could be distinguished by an experienced nuclear medicine physician. In this case, FDG PET/CT demonstrated the capacity of identifying cardiac metastasis even if missed by contrast-enhanced chest CT. Metastatic lesions could initially be hypermetabolic only and cause structural destruction/change as time goes by. It may be the reason why PET showed but contrast-enhanced chest CT did not. Although EKG-gated chest CT may help to identify cardiac metastasis, it is unlikely feasible as a routine practice. In conclusion, any myocardial uptake on FDG PET/CT should be carefully differentiated for any possible abnormality including metastasis in oncologic setting.

老化對於腦部活化時與高二氧化碳狀態下 BOLD 訊號的影響
Aging Effects on BOLD Signal Changes during Brain Activation and under Hypercapnia Challenge

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PURPOSE: To evaluate the difference in cerebrovascular response between elderly and young adults, during finger tapping and under breath-hold challenges, by using 3-Tesla blood oxygenation-level dependent (BOLD) MRI.

MATERIALS AND METHODS: There were 20 healthy young adults (F/M = 8/12, 20 – 31 y/o) and 12 healthy old adults (F/M = 10/2, 61 – 78 y/o) recruited for the study. The finger-tapping paradigm comprised of three cycles of a 39-second resting period and a 21-second motor task (at 1/sec). The breath-hold paradigm comprised of one 30-second preparation stage (natural breathing) and three 60-second periodic breath-hold cycles (holding breath for 15 seconds and natural breathing for 45 seconds). BOLD MRI was performed using a T2*-weighted single-shot GE EPI sequence: TR/TE/FA= 3000 msec/35 msec/90°, matrix size = 64 x 64 and in-plane resolution = 3 mm x 3 mm. The change of end-tidal CO₂ (Δ ET CO₂) was measured.

RESULTS: In the finger-tapping study, there significantly smaller averaged signal change and larger activation volume in motor cortex in old group than in young group. In the breath-hold study, there were significantly smaller activation volumes, larger Δ ET CO₂ and smaller cerebrovascular reserve (CVR), in terms of BOLD/ Δ ET CO₂, in old group than in young group. There was significant positive correlation between finger-tapping BOLD signal changes and CVR, both in the old and young group.

CONCLUSION: There were significant aging effects on BOLD signal changes during brain activation and under hypercapnia condition, which should be taken into consideration when applying BOLD MRI for clinical study.

PT145-BN

從頭至腳且從神經至肌肉骨骼系統的結核菌感染之放射線影像
Head to Foot and from Nerve to MSK System Infected with TB and Its Radiologic Imaging

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PURPOSE: Think TB first! TB is everywhere and anywhere in the world, same in our whole human body and organ. More than 20 billion infected TB and 3 billion people and get this disease a year. Out of 1/3 world population were infected with TB. Then 2 percent will get this infected TB disease this year and two out of five are going too died in this infected TB on this very year. Some people with TB are very difficult in diagnosis and treatment. That's why we have to discuss this disease over and over again and try to cure and stop this notorious disease.

MATERIALS AND METHODS: We are using plain films, CT, MRI and of course plain films are still the first priority to find the relationship with TB and then judged by economic condition to use CT or MRI to find and to diagnosis this TB disease. Find out lesion then do biopsy and cultured of this specimen and confirm this disease.

RESULTS: MRI still is the best modality with no radiation and with sensitivity and specificity is best and far better than plain films and CT. The only problem is so expensive for few people can afford. And still we are working on molecular imaging to target on this disease to make sensitivity and specificity will be better and quicker.

CONCLUSION: TB infection will depend on the numbers of this TB bacteria, Its air concentration, length of contacted time and also the immune ability of this people. That's why the elder and children are easier get higher TB infectious disease. We will discuss with different modality imaging to diagnosis TB, its etiology, transmission, pathophysiology, and how to treat this disease, although there are still a lot of victims, we do have confidence in preventing and cured this disease. No more suffering of this disease from new vaccine invention and new drug use to eliminated this ugly disease. Hope in near future there are no one get sick with TB.

急性腦損傷之白質損傷與周邊氧化壓力之關聯性

Association between Peripheral Oxidative Stress and White Matter Damage in Acute Traumatic Brain Injury

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PURPOSE: The purpose of this study is to investigate the association between serum oxidative stress and the microstructural changes in deep brain anatomies by diffusion tensor imaging (DTI) in patients with acute traumatic brain injury (TBI).

MATERIALS AND METHODS: DTI accompanied with serum thiol and thiobarbituric acid-reactive substances (TBARS) concentration were performed in 24 patients with acute TB and in 24 healthy volunteers. The fractional anisotropy (FA) and apparent diffusion coefficient of deep brain regions were measured and correlated with the disease severity, serum thiol and TBARS concentration.

RESULTS: The patients with TBI displayed lower FAs in the bilateral anterior internal capsule, bilateral cerebellar peduncle and left cerebral peduncle ($p = 0.000, 0.011, 0.001, 0.000,$ and 0.008 respectively) and higher serum TBARS concentration ($p = 0.014$). Negative correlations were found between the serum TBARS concentration and the FAs values in right anterior internal capsule, bilateral cerebellar peduncle ($p = 0.008, 0.026,$ and 0.000 respectively).

CONCLUSION: We demonstrated an increase systemic oxidative stress and deep brain WM damage in acute TBI. The high correlation between each other might suggest a common inflammation process co-vary both peripheral and central acute reaction after TBI.

全單側大腦中風的原因及磁振造影影像分析

Complete Cerebral Hemispheric Infarction as a Result of Different Causes: Diagnosis with Magnetic Resonance Diffusion-Weighted Images

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PURPOSE: Although intravenous thrombolytic therapy using r-TPA has been widely accepted as the treatment of choice for acute ischemic infarction within 3 hours of onset and without evidence of hemorrhage on non-enhanced computed tomography. Dissection of the ascending aorta may result in neurological complications such as embolic cerebral infarction and carotid dissection. Dissection of the innominate artery with compromised flow of the right/left internal carotid and vertebral arteries with acute right/left hemispheric cerebral infarction following aortic dissection has not ever been reported yet. In this report, we present the imaging and operative evidences of the unusual complication of aortic dissection and discuss the additional value of MR study in the issue of acute ischemic cerebral infarction.

MATERIALS AND METHODS: Medical records of 117 consecutive patients with type A aortic dissection over 11 years were retrospectively analyzed for clinical history, CT findings, MR findings, and neurologic complications. Neurologic complications were classified into early-onset complications in one month before and after diagnosis. Independent t-test or Chi-square test (or Fisher exact test) was used for comparing the different groups. Multivariable logistic regression analysis was performed to determine the independent association between variables.

RESULTS: The mean age of the included patients (67 male and 50 female) was 59.4 years (range 19-91 years). 41 patients (14.7%) had a neurologic complication in one month before and after diagnosis. Advanced age and classic type of dissection were independently associated with the neurologic complication in patients with type A dissection. 7 patients (3 men and 4 women) with imaging proven aortic dissection and complete cerebral hemispheric infarction underwent adequate treatment. Renal impairment, pulse deficit, neurologic complication and nonsurgical treatment were independent variables for determining in-hospital mortality in patients with type A dissection.

CONCLUSION: From these cases we get some learning and experience. First, the presence of tri-territorial acute right/left hemispheric cerebral infarction highly suggests a dissection of the common trunk of the internal carotid and vertebral arteries, the innominate artery or the proximal aortic arch. Second, either total occlusion of the innominate artery or massive embolic showering may result in similar occlusion of the right hemispheric intracranial vessels. Third, CT study alone is inadequate in evaluating acute ischemic cerebral infarction in cases of aortic dissection and may mislead the clinicians or neurointerventionalist to undergo dangerous intravenous or intraarterial thrombolytic therapy. Fourth, a multi-sequence MR study is of use not only in identifying the presence and extent of the infarction but also pointing out the underlying cause of aortic dissection.

未明常壓腦水腫之下肢運動神經軸突完整性之改變：利用擴散張量影像標記來鑑別
腰椎排水反應者與不反應者

Altered Axonal Integrity of Lower Limb Motor Tracts in Idiopathic Normal Pressure
Hydrocephalus: A DTI Biomarker for Differentiating Lumbar-Drainage Responders from
Non-Responders

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PURPOSE: We aim to determine whether diffusion tensor parameters can be used as biomarkers to differentiate lumbar-drainage responders from non-responders in INPH patients.

MATERIALS AND METHODS: We prospectively enrolled 25 patients with INPH and gait disturbance, and 17 age- and sex-matched controls for this study. All the subjects were imaged in a 1.5 T MR system with a 8 channel head coil. A spin-echo EPI sequence was used to target the diffusion information of white matters along 15 directions with $b=1000s/mm^2$, $TR=10000ms$, $TE=90ms$, matrix size= 128×128 , slice thickness= 4 mm , and no gap. After data acquisition, DTIStudio was used to reconstruct the images and calculate the DTI-derived parameters. To evaluate the shear effects from the hyperdynamic CSF on the corpus callosum, ROI were then placed at the genu, body and splenium of the corpus callosum, considering the different effects by the shear force in each region.

RESULTS: Tract-specific analysis of the lower-limb CST at pontine level showed that axial eigenvalues were significantly increased ($P < 0.01$), whereas FA and radial eigenvalues were not significantly altered, in patients with INPH compared with the control. In corpus callosum, the distended body showed decreased FA and increased axial eigenvalues. The non-responders revealed increased axial eigenvalues than that of the responders ($p < 0.01$). ROC analysis showed accuracy 0.898 ($p < 0.001$), and a sensitivity of 100% and specificity of 100% at a cutoff value of 0.0018.

CONCLUSION: We conclude that DTI may potentially be useful in differentiate the responders from non-responders in the diagnosis of INPH patients, thus providing a non-invasive method to improve the predictability of shunt responsiveness in INPH.

動物中風模型的擴散不等向性之演進：不等向性與擴散性的相對貢獻

Evolution of Fractional Anisotropic Changes in an Animal Model of Ischemic Stroke: Relative Contribution of Anisotropic Versus Magnitude Diffusivity

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PURPOSE: We aim to investigate the differential behaviors of q and L of fractional anisotropy in the ischemic penumbra versus the infarct core using a longitudinal rat stroke model.

MATERIALS AND METHODS: Occlusion of one middle cerebral artery (MCA) was performed on eight rats as the model of ischemic stroke. DTI was performed at 7T with six non-collinear diffusion-encoding gradients at a b factor of 1,100s/mm². A multi-shot EPI (TR=10000ms, TE=31ms, NEX=4) was performed to investigate the longitudinal changes of q and L, executed at 0.5/1.5/2.5/3.5/4.5/5.5, and 6.5 hours after stroke onset. The ischemic core (IC) and ischemic penumbra (IP) were defined based on the diffusion-perfusion mismatch concept. Diffusion tensor parameters q and L were then derived, and with the diffusion tensor ellipsoids shown to provide visualization of the dynamic morphological alterations.

RESULTS: In both IC and IP, a more prominent temporal changes in the numerical value of q is found than in L, suggesting that post-ischemic changes in FA is largely dominated by the anisotropic diffusivity q rather than by the magnitude diffusivity L. In addition, both q and L remained declined stably in the penumbra, unlike in the ischemic core where the anisotropic diffusivity is seen to reduce continuously to approximately -40% up to 6.5 hours.

CONCLUSION: Our preliminary result suggests that q may detect stroke-related abnormality with a higher sensitivity than L, and the relative stable q in ischemic penumbra may provide insight into the definition of salvageable brain tissue in hypoperfused brain at acute setting.

急性一氧化碳中毒之白質病變：擴散峰度 vs 擴散性

Leukoencephalopathy in Acute CO Intoxication: Diffusion Kurtosis Versus Diffusivity

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PURPOSE: We aim to evaluate the feasibility of using parametric indices derived from diffusion kurtosis imaging (DKI) for early detection of leukoencephalopathy in patients with acute CO intoxication.

MATERIALS AND METHODS: 11 subjects including 5 patients with acute CO intoxication and 6 healthy volunteers were enrolled in this study. All the MR imaging was performed on a 3 T MR scanner. DKI data was obtained used two sequential spin echo diffusion-weighted 2D EPI images with b values of 0, 1000, and 3000 s/mm² in 40 non-collinear directions. Other imaging parameters were as follows: TR/TE=10000/110.5 ms, FOV=240x240 mm², matrix size=256x256, slice thickness=4 mm. After data acquisition, a 2D median filter was performed first to alleviate the noise effect due to lower SNR of b3000 images. All the DKI images were used to calculate the DK-related parametric maps including axial, radial and mean kurtosis (MK). DT-related parametric maps were also derived from diffusion tensor model, including axial, radial and mean diffusivity, as well as FA maps.

RESULTS: Two ROIs in the regions of body and splenium of corpus callosum were selected for quantitative analysis by referencing the FA map. The mean and standard deviations of the DT- and DK-related parametric indices were derived. Significant difference of mean kurtosis was shown on body of corpus callosum in the patient with acute CO intoxication as compared to that in control subjects.

CONCLUSION: DKI could provide more information, which may have potential to detect early microstructural changes and helpful in predicting the possibility of leukoencephalopathy in patient with acute CO intoxication.

比較減釐法與傳統的三維航時磁振血管攝影在腦及顳骨情形中併有短 T1 弛豫時間的非期望污染

Comparison between Subtraction and Conventional 3D TOF MR Angiography for Brain and Temporal Bone Conditions with Unwanted Contaminations with Short T1 Relaxation Times

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PURPOSE: To determine whether subtraction 3D time-of-flight (TOF) MR angiography improves image quality in brain and temporal bone diseases with unwanted contaminations with short T1 relaxation times.

MATERIALS AND METHODS: Twelve patients with intracranial hematomas, brain tumors or middle ear cholesterol granulomas and 24 healthy volunteers were scanned with conventional and subtraction 3D TOF MR Angiography. The qualitative evaluation of each MR angiogram was based on signal-to-noise ratio (SNR), contrast-to-noise ratio (CNR) and scores in three categories: (a) presence of misregistration artifacts, (b) ability to selectively display arterial anatomy (without contamination by materials with short T1 relaxation times), and (c) arterial flow-related enhancement.

RESULTS: We included 12 patients with intracranial hematomas, brain tumors or middle ear cholesterol granulomas. Subtraction 3D TOF MR angiography yielded higher CNRs between the area of the basilar artery (BA) and normal-appearing parenchyma (NAP) of the brain and lower SNRs in the area of the BA compared with the conventional technique (147.7 ± 77.6 vs. 130.6 ± 54.2 , $P < 0.003$ and 162.5 ± 79.9 vs. 194.3 ± 62.3 , $P < 0.001$, respectively) in all 36 cases. It did not deteriorate image quality with misregistration artifacts and showed a better selective display of arteries ($P < 0.0001$) and arterial flow-related enhancement ($P < 0.044$) than the conventional method.

CONCLUSION: Subtraction 3D TOF MR Angiography is more appropriate than the conventional method for brain and temporal bone conditions with unwanted contaminations with short T1 relaxation times.

雙能雙源電腦斷層灌流與血管攝影在急性缺血性中風之應用

CT Perfusion and CT Angiography in Acute Ischemic Stroke Using Dual Energy CT

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PURPOSE: The CT perfusion (CTP) and CT angiography (CTA) were clinically useful tools in acute ischemic stroke for determining penumbra area and as guidance for thrombolytic therapy. This educational exhibit will describe our procedure in clinical practice and introduce some potential pitfalls and technical errors by using DECT (dual energy CT).

MATERIALS AND METHODS: (a) Technical aspects of CTP/CTA and potential pitfall: introduce our procedures with CTA and CTP using DECT, technical errors in choosing AIF or VOF during CTP. (b) Pathologic conditions: Infarct (MCA, PCA), vasospasm, subclavian steal syndrome, vertebrobasilar insufficiency, carotid stenosis, postcarotid stenting, postictal change. (c) Mimics of ischemic stroke: hypoglycemia, seizure, old ischemic infarct.

RESULTS: Obtaining an appropriate diagnostic image is very important in dealing with acute ischemic stroke patient for thrombolytic therapy guidance. With the advent of DECT, we can obtain near whole brain perfusion with less contrast amount. CT perfusion can tell us the infarct core and penumbra region while CTA can show us the condition of carotid and vertebrobasilar arteries. We organize a practical way to understand scanning principle and procedure, to interpret various pathologic conditions and to show some stroke mimickers.

CONCLUSION: With this knowledge, one should be able to understand the role of CTA/CTP in acute ischemic stroke.

相位對比磁振造影影像在自發性低腦壓患者的診斷以及治療評估的運用
Usefulness of Phase-Contrast Magnetic Resonance Imaging for Diagnosis and Treatment
Evaluation in Patients with SIH

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PURPOSE: Most diagnostic tools for spontaneous intracranial hypotension (SIH) are either invasive or occasionally inconsistent with the clinical condition. In this study, we examined the CSF dynamics in SIH using phase-contrast magnetic resonance (PC-MR) imaging.

MATERIALS AND METHODS: Seventeen SIH patients and 32 healthy individuals, matched by sex and age, were recruited. Each person underwent brain and PC-MR imaging using 3-Tesla MRI. We evaluated the differences in image parameters among patients during the initial and recovery stages, against the status of the control group.

RESULTS: SIH patients had lower CSF flow-volume, flux, peak velocity, and higher systolic-to-diastolic time ratio, as well as systolic-to-diastolic volume ratio compared to the control group and the conditions when they recovered. The flow time and volume of the diastolic phase markedly increased after treatment. The discriminating power of PC-MR for SIH was good. Diffuse pachymeningeal enhancement and venous engorgement were present when their PC-MR values lower than the cutoff values for SIH diagnosis. The headache scores correlated with the peak velocity and pituitary volume.

CONCLUSION: Non-invasive PC-MR could provide valid parameters for diagnosis and treatment follow-up in SIH patients. It may be more sensitive than conventional brain MRI.

PT154-BN

靜息態人腦與鼠腦功率譜之種子點區域與獨立成分分析法比較
Comparison of Power Spectrum in Resting Brain Networks of Human and Rat using Seed
Regions and Independent Component Analysis

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PURPOSE: To find a stable and reliable analysis method of resting state functional MRI (rsfMRI) for human and rat, and to compare the region correlation and power spectrum in human and rat brain networks using seed regions and independent component analysis (ICA).

MATERIAL AND METHODS: Whole human (n = 18, 31 runs) and rat brain (n = 5, 10 runs) images were acquired by 1.5T Siemens SONATA MRI and 7T Bruker MRI, respectively. In data analysis, the human and rat brain data were first coregistered using Statistical Parametric Mapping (SPM) and FMRIB Software Library (FSL), respectively, and detrend, high-pass filter as well as smoothing were then performed. The independent component analysis (ICA) was used for objective analysis with FSL, and seed regions functional connectivity analysis with alphasim correction was used for subjective analysis by Resting State fMRI Data Analysis Toolkit (REST), respectively.

RESULTS: The outcome of rsfMRI is different for humans and rats and depends strongly on the seed position in the seed regions functional connectivity analysis, and the applied number of components in the ICA. The most important difference was the power spectrum of several networks, such as visual, motor, default mode, amygdala, hippocampus and thalamus, in the rat shifted to lower frequency regime compared to human brain. Furthermore, a higher number of components were needed for the ICA analysis to separate different cortical regions in rats as compared to humans.

CONCLUSION: Appropriate image analysis methods in resting state fMRI were expected to be widely used in human and rodent neuropathological research.

利用高時間分辨率對比增強磁共振血管造影來評估放射治療後殘留的腦內動靜脈畸形
Evaluation of Residual Brain Arteriovenous Malformation after Radiosurgery with
Time-resolved Contrast Enhanced MR Angiography

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PURPOSE: For evaluation of cerebral vascular lesions such as arteriovenous malformation (AVM) and dural arteriovenous fistula (DAVF), digital subtraction angiography (DSA) is remaining a gold standard diagnostic method. The aim for this study was to analyze the value of different magnetic resonance angiography images, 4D dynamic contrast-enhanced MRA (4D-MRA) and time-of-flight magnetic resonance angiography (TOF MRA) compared with DSA in identifying their diagnostic accuracy in evaluating residual arteriovenous malformation (AVM) after radiotherapy.

MATERIAL AND METHODS: A total of 45 patients with AVM after radiotherapy were included in this study. 4D-MRA and TOF examinations were performed simultaneously with conventional angiography as standard references. Two experienced neuroradiologists reviewed the images for comparing the diagnosis accuracy, arterial feeder and venous drainage between these two MRA methods and compared with DSA. Inter-observer and inter-modality agreement was assessed by non-parametric ANOVA with Kruskal-Wallis test.

RESULTS: Almost all vascular lesions (93.3%) were correctly diagnosed using 4D-MRA. However, the MIP TOF MRA only detected 73.3% lesions. There is statistically significance difference ($P < 0.01$) regarding to the lesion diagnostic accuracy, arterial feeder and venous drainage identification in order as DSA greater than 4D-MRA, 4D-MRA greater than MIP TOF MRA. However, the residual AVMs with diameter greater than 3cm showed no significant difference between DSA and 4D-MRA in lesion assessment ($p > 0.05$).

CONCLUSION: Despite 4D-MRA is not able to completely replace DSA in assessing AVMs after radiation treatment. It still proved to be a reliable modality with beneficial supplement to DSA for follow up and with higher accuracy and consistency with DSA as comparing MIP TOF MRA.

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體積、形狀、昏迷指數、腦出血分數：何者對腦出血 30 天死亡率的預測較佳
Size, Shape, Glasgow Coma Scale and ICH Score: Which Predicts the 30-Day
Mortality Better for Intracerebral Hematoma

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PURPOSE: The relationship between the shape and size of intracerebral hemorrhage (ICH) hasn't been fully investigated, so does the estimation deviation between the ABC/2 formula and computer-assisted volumetric analysis (CAVA) regarding the hemorrhagic size. We aim to verify the relationship between the hemorrhagic shape and size, the hemorrhagic size-dependent estimation deviation and 30-day mortality between two volumetric methods.

MATERIALS AND METHODS: This study recruited 106 patients diagnosed as ICH by non-enhanced computed tomography study (CT) within 24 hours after onset. The hemorrhagic size was measured by the ABC/2 and CAVA methods. The patients were classified into two subgroups (round-to-ellipsoid and irregular-to-multi-centric) based on the hemorrhagic shapes and five subgroups (< 10 ml, ≥ 10 ml and < 20 ml, ≥ 20 ml and < 30 ml, ≥ 30 ml and < 60 ml, and, ≥ 60 ml) based on the hemorrhagic sizes. Estimation deviation of the hemorrhagic size and 30-day mortality were calculated for statistical analysis.

RESULTS: The hemorrhagic shape is significantly related to the hemorrhagic size. The overestimation of hemorrhagic size by the ABC/2 method was positively correlated with the size of ICH. The 30-day mortality was underestimated by ABC/2 method by about 15% for hemorrhagic size of 60 ml or more when considering the hemorrhagic size alone, but was equally estimated based on the ICH Score calculation.

CONCLUSION: Our study concludes that ABC/2 method overestimates the hemorrhagic size with the size deviation dependent to the hemorrhagic size itself. ICH Score helps avoid the underestimation of 30-day mortality by using ABC/2 method.

利用多頻譜腦部磁共振造影像分析以量化腦白質病變和腦組織結構改變
Quantitative Assessment of White Matter Load and Brain Tissue Alterations in Multispectral Synthetic MR Images

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PURPOSE: White matter lesions (WML) have been well recognized the association with declining cognitive ability, future stroke risk and dementia. In this study, we developed a novel multispectral approach to effectively perform quantification of gray matter (GM), white matter (WM), cerebrospinal fluid (CSF) and WML simultaneously by using the algorithms derived from remote sensing techniques.

MATERIALS AND METHODS: Synthetic data from the Brain Web Simulated Brain Database was used to evaluate the accuracy of WML volume measurements by using the proposed method to analyze three sets of T1-weighted, T2-weighted and proton density images. Constrained energy minimization (CEM) has been widely used for target detection in hyperspectral remote sensing imagery, and can automatically detect the desired target signal source using a unity constraint. Atrio-algorithm based hybrid classifier was implemented for segmentation of multislice-multispectral brain MR images in the native coordinate space. The similarity index was measured to statistically evaluate the results of the GM, WM, CSF and WML classifications with the ground truth data of the simulated brain images.

RESULTS: The results showed high Similarity indexes of GM, WM, CSF and WML segmentation in the synthetic normal brain data. The similarity index of WML classification of synthetic data with 3% noise level was 0.899, which was higher than those of other reported in the literatures.

CONCLUSION: The proposed voxel-based algorithms have several advantages in quantification of multispectral brain MRI and would be promising for comprehensive study the relationships of the WML load with the severities and statuses of the underlining diseases.

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呼吸模式對嗅覺的影響-腦功能實驗
An fMRI Study of Investigating the Influence of Breathing Pattern on Olfaction

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PURPOSE: Deep and slow breathing decreased respiratory frequency and increased tidal volume. In addition, it has been reported that deep and slow breathing decrease anxiety and negative emotions. Abdominal respiration was a simple way to reach deep and slow breathing. Sensibility of smell associated with parameters including odorant molecules concentration, inspiratory rate and inspiratory volume. In the present study, we aimed to probe whether breathing pattern influence olfactory sensibility.

MATERIALS AND METHODS: Using SIMENS 1.5 Tesla MRI and Bold EPI sequence proceeded experiment. Ten subjects was confirm they all had normal respiratory function, and they can keep their mind on abdominal respiratory. Performance of thorax respiratory and abdominal respiratory were staggered at 12 seconds. During the 12-s respiratory, imitation banana extract was presented for 3-s with a 3-s peppermint essential oil so as to get odor stimuli and minimize adaptation. Data were analyzed using Statistical Parametric Mapping (SPM) (Wellcome Department of Cognitive Neurology, London, UK) implemented in MatLab (Mathworks Inc., Sherborn, MA).

RESULTS: We found the number of activation points of primary olfactory cortex and secondary olfactory cortex increased significantly during abdominal respiratory.

CONCLUSION: The result of abdominal respiratory was found subjects focus their attention on respiratory and T value reached significance. Feeling odors more strongly was proved by increasing activation points. Abdominal respiratory could improve olfactory sensibility.

神經解剖分割和彌散張量成像在阿爾茨海默氏症有無合併抑鬱症患者的研究 Neuroanatomical Segmentation and Diffusion Tensor Imaging Investigation in Alzheimer's Disease Patients without and with Depression

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PURPOSE: The aims of this study attempt to investigate the neuroanatomical segmentation and DTI alternations in Alzheimer's disease (AD) patients with and without depressive symptoms by using morphometric analysis and diffusion tensor imaging (DTI) for exploring the relationships of the depression with AD.

MATERIALS AND METHODS: In this study, nineteen Alzheimer's disease (AD) patients (mean age 78.53 ± 3.36) without depressive symptoms and 26 Alzheimer's disease with depression (ADD) subjects (mean age 74.77 ± 3.17) were enrolled. The MRI was performed with 1.5T MR scanner. The imaging protocol included of T1WI with MP-RAGE, T2WI and fast FLAIR with SPACE technique. The DTI images were obtained by the single-shot EPI sequence. Multispectral MRI segmentation was processed with the SPM8 software package. The ROI masks encompass the frontal, temporal, parietal, occipital, limbic lobes and sub-lobar region. Global and regional volume fraction of gray matter (GM) and white matter (WM) were calculated. DTI analysis was performed and registered with MPRAGE image. The aforementioned segmented ROI masks of GM and WM maps were then used to define the ROI in DTI. Then, the quantification of the microstructural alternations for each subject was acquired by averaging the fractional anisotropy (FA), mean diffusivity (MD) values within the ROI.

RESULTS: For analysis of regional neuroanatomical alternations, WM volume fraction in the sublobar region of the AD patients was significantly lower than that of the ADD patients, but no significant difference in other regions between two groups. The DTI results revealed significantly higher a global FA and lower global MD indices in ADD patients than AD patients. For analysis of regional WM integrities, ADD patients appeared to have higher FA and lower MD indices than AD patients in frontal, temporal lobes and sublobar region.

CONCLUSION: The investigation of neuroanatomical and microstructural alternation with morphological and DTI MRI would much helpful in location of brain abnormalities, relationships between AD and depression, and understanding the etiology of complex neuropsychiatric conditions.

在 SWI 影像顯示腫瘤內小血管可鑑別原發性和繼發性腦腫瘤 Intratumoral Small Vessels on SWI Can Differentiate Primary from Secondary Brain Tumors

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PURPOSE: Previous study has shown that SWI is superior to show small vessels and micro-hemorrhage in brain tumors. The purpose of this study is to differentiate brain lymphoma, glioma and metastasis based on intratumorous small vessels.

MATERIALS AND METHODS: There were eight patients with brain lymphoma, 12 glioma, three gliosis and 24 metastatic carcinoma. All cases received histological diagnosis. All MR images were review by two radiologists and consensus of interpretation was reached. We evaluate whether there was visible small vessel passing through brain tumors or stop/deviated by the brain tumors on SWI. Other findings on SWI such as hemorrhage and/or calcifications were also reviewed.

RESULTS: In 8 patients with lymphoma, small vessels passing through in at least one tumor on SWI were identified in all cases (100%); 5 of them (62.5%) were more apparent on MIP images. Intratumorous calcifications were noted in one case (12.5%). In glioma, three out of 12 (25%) cases depicted intratumoral small vessels seen on SWI. However, intratumoral vessels of one case (8.3%) also were noted on TOF MRA images and another two cases on post contrast T1 images which were excluded from SWI comparison due to motion artifact. In the three gliosis cases, one (33.3%) showed small vessels at peripheral region of the gliosis on SWI. One (33.3%) showed a small vessel passing through, and one showed hemosiderin deposition. In all 24 metastatic carcinoma, no small vessels passing through metastatic were noted on SWI. Two cases (8.3%) depicted cortical vein passing by tumor, 6 cases (25%) showed tiny medullary veins stopped by tumor.

CONCLUSION: If small vessels passing through tumor could be recognized on SWI, it can be reliable to exclude the possibility of brain metastasis. Lymphoma offers the highest possibility to demonstrate small vessels passing through tumor as compared with gliosis and brain glioma on SWI.

以功能性磁振造影探討 660nm 紅光對嗅覺的影響

Utilized fMRI to investigate the Olfactory Sensitivity after 660nm Red Light Stimulation

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PURPOSE: Recently, a growing body of research indicates that 660nm red light can stimulate and activate cells, and this has also been used to improve respiratory allergy symptoms. This study aims at comparing the differences of olfactory sensitivity before and after nasal been irradiated by 660nm red light and discuss on whether 660nm red light stimulation will help to improve the ability to smell.

MATERIALS AND METHODS: In this study, we have five subjects whose respiratory system is healthy (20~24 years old, right-handed). During fMRI scanning, we give two kinds of fragrance to avoid olfactory fatigue. After first olfactory fMRI test, the subjects irradiated their nasal by 660nm red light 5 minutes every day. After 14 days, we run the second fMRI test. Data were analyzed using Statistical Parametric Mapping (SPM) (Wellcome Department of Cognitive Neurology, London, UK) implemented in MatLab (Mathworks Inc., Sherborn, MA).

RESULTS: The main results of this experiment show that the number of olfactory activation is significant increase after two weeks of 660nm red light irradiation.

CONCLUSION: According to previous studies, that 660nm red light can improve nasal tissue's metabolic detoxification and immunity; also accelerate micro-vascular blood flow velocity within the nasal. After this experiment, we confirmed that the olfactory activation pixel increased. We did find one definite result; the nasal olfactory would be more sensitive after 660nm red light stimulated for a period time.

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腦雲應用：使用機率擴散張量影像追蹤白質內的病灶對功能之影響

Lesion-Function Mapping of White Matter Using Probabilistic DTI in Brain Cloud

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PURPOSE: Non-specificity of small white-matter lesion has challenged the neuroradiological diagnosis. By combining the neuroimaging informatics of DTI from constructed DTI database (Brain Cloud).

MATERIALS AND METHODS: The 30 male normal subjects were recruited for construction of MR database. Using de-linked with high angular resolution diffusion image data, 60 spherical encodings of diffusion with 5 B0 baseline images and 3D T1W images. The de-linking procedures included subject information of DTI and anatomical data and de-scalping the DTI data. Bayesian Estimation of Diffusion Parameters Obtained using Sampling Techniques, with modeling crossing fibers was applied by including the first three principal vectors for building up distributions on diffusion parameters at each voxel by Monte Carlo sampling. It created all the files necessary for running probabilistic tractography. Probabilistic tracking of WM VOI, defined by a WM template in 80% threshold, was obtained using voxel-based and target-based seed classification of seed regions of Brodmann's areas 1-47.

RESULTS: Parcellation of WM within VOI was obtained by probabilistic tracking using 47 BA as targets. Results of one subject demonstrated the parcellation pattern consistent with BA when subcortical WM and basal ganglia showed complexity of classification. Based on WM lesions detected by FLAIR and the 1st ranking of voxel-based connectivity-based seed classification.

CONCLUSION: The functional of WM lesions can be evaluated by voxel-based connectivity-based seed classification. The concept of "Brain Cloud" for diagnosis or telemedical consultation of brain neuroimaging was supported by the database approach of lesion-function correlation using a database of probabilistic diffusion tensor tractography of human brain.

使用通用擴散波數取樣磁振造影評估經放射線半腦照射之兔腦變化 Generalized Q-sampling Imaging Evaluation in Rabbit Brain after Cerebral Hemisphere Radiation Exposure

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PURPOSE: To improve evaluation of the neuro-toxic adverse effects of irradiation treatment in both gray and white matter structures, we longitudinally evaluated the changes in various brain compartments on a clinical MR scanner by using generalized q-sampling imaging (GQI) indices mappings, generalized fractional anisotropy (GFA), quantitative anisotropy (QA) and isotropic value (ISO) of the orientation distribution function (ODF), for single sub-lethal high dose (30 Gy) cerebral hemisphere exposure radiation-induced brain injury on adult rabbit model.

MATERIALS AND METHODS: Five male New Zealand rabbits of one year of age received irradiation of 30 Gy (collimations = 4 cm x 5 cm) to the right hemi-brain with a single highly collimated 6MV photon beam from a Varian CL21EX linear accelerator (Varian, Palo Alto, CA, USA) under anesthesia. Brain MRI examinations were performed before irradiation and at 1st to 48th week post-irradiation (totally 12 time points) on a 1.5T MR scanner (Sonata, Siemens, Erlangen, Germany) with double loop array coils. Whole brain coronal multiple shells diffusion data were acquired using a multi-slice, single-shot spin echo EPI sequence with TR/TE=2900/128 ms, resolution = 0.78 x 0.78 x 2 mm³, number of slices=12 (contiguously from the genu of the corpus callosum to the end of the cerebrum). They were obtained using 12 diffusion-encoding directions with b values changing from 0 to 2,000 s/mm².

In data analysis, denoise was performed using MATLAB first. After denoise, GQI indices mappings, including GFA, QA and ISO were calculated from multiple shells diffusion data using DSI studio (NTU, Taiwan). Using imageJ (NIH, USA), ROIs were drawn manually on three consecutive slices of the GQI indices mappings in 4 different compartments, bilateral cerebral cortex, external capsules, hippocampi and thalami. All the results were expressed as mean ± standard error (SE), and the ratios of right (injury) / left (control) were calculated for statistical analysis. Paired t-test was used to detect statistical differences between the pre- and the post-irradiation time points. A p-value of < 0.05 was considered to indicate statistical significance.

RESULTS: Three rabbits died at 26th, 32nd and 33rd weeks after the irradiation. These deaths were possibly due to poor eating and drinking. Therefore, the MRI data from the baseline to the 24th week were used for further statistical analysis. One of the remaining rabbits was sacrificed for histological evaluation after the 48th week of MRI scans. In cortex: there was no clear trend in the GFA R/L ratio. The QA and R/L ratio showed a decrease at the 1st week and rapid increased at the 2nd week, follow by reaching a plateau, and the differences reached statistical significance at the 2nd week (p-value=0.031) in the ISO R/L ratio. In external capsule: there was no clear trend in the GFA R/L ratio. The QA and ISO ratio showed a rapid increased during the initial 2 weeks follow by reaching a plateau and gradually decrease. The differences reached statistical significance at the 2nd week (p-value=0.038) in the ISO R/L ratio. In hippocampus: there was no clear trend in the GFA R/L ratio. The QA and ISO R/L ratio showed a decrease at the 1st week and rapid increased at the 2nd week, follow by gradually decrease after 12th week post-irradiation, and the differences reached statistical significance at the 12th week (p-value =0.016) and the 16th week (p-value=0.007) in the QA R/L ratio. In thalamus: there was no clear trend in the GFA R/L ratio. The QA and ISO R/L ratio showed a decrease at the 1st week and rapid increased at the 2nd week, follow by gradually decrease, and the differences reached statistical significance at the 16th week (p-value=0.047) in the ISO R/L ratio.

CONCLUSION: With GQI indices, we can detect more complex pathophysiologic changes in both gray and white matter for the longitudinal evaluation of radiation-induced brain injury using a 1.5 T clinical MR scanner.

利用功能性磁振造影探討大鼠急性痛風所引發的大腦反應

Investigation of Cerebral Responses Induced by Acute Gout Attack in Rats Using Functional Magnetic Resonance Imaging

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PURPOSE: Gout, representing one of the most painful forms of diseased conditions, is caused by monosodium urate (MSU) crystals deposited in the joints and/or soft tissues. How peripheral reactions induced by MSU deposits lead to significant painful experiences is an important question to be addressed.

MATERIALS AND METHODS: The present study took advantage of cerebral blood volume (CBV) weighted functional magnetic resonance imaging (fMRI) to characterize the pattern of central activation related to MSU-induced pain processing. Behaviorally, the MSU injected rat showed swelling of the MSU-injected wrist that was very obvious at 3 hr, and gradually recovered at 96 hr. Within this timeframe, fMRI was performed at 3, 24, 48, and 96 hr after MSU injection.

RESULTS: Nociceptive stimulation to the non-gouty forepaw induced CBV increases in the primary somatosensory cortex yet CBV decreases in the striatum, as seen previously. By contrast, nociceptive stimulation to the gouty side induced an augmented CBV response in the primary somatosensory cortex than the non-injected side at 3, 24 hr after MSU injection. No significant differences in the striatum were detected. In addition, stronger CBV increases in the thalamus were also observed following stimulation to the gouty side. Moreover, abundant COX2 expression and myeloperoxidase staining were observed in the joints and periarticular soft tissues, which depict the infiltration of inflammatory cells.

CONCLUSIONS: The results indicate augmented central responses in the cortex and the thalamus during the acute phase of gouty arthritis. Our study presents the first piece of direct evidence on the central effects of peripheral inflammation induced by acute gouty arthritis using fMRI.

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利用動態顯影磁振影像來預測腦轉移的治療效果

Predicting Treatment Response of Brain Metastasis Using Dynamic Contrast-Enhanced Magnetic Resonance Imaging

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PURPOSE: To assess if follow-up perfusion indices transfer coefficient [Ktrans] measurements can help predict treatment response in patients with cerebral metastases.

MATERIALS AND METHODS: Patients with brain metastasis after radiation therapy were enrolled for three series of consecutive follow up. The DCE-MR imaging of each patient included covered whole brain sequences of pre- and postcontrast T1-weighted images and T1-weighted DCE-MR imaging. The perfusion scans were performed after the injection of 1.0M gadobutrol at a dose of 0.1 mmol/kg of body weight, at an injection rate of 3 ml/s, followed by a bolus injection of 20 mL saline flush. A total of 22 slices of axial images with a temporal resolution of 4.6 seconds for each time point were acquired. A radiologist outlined the region of interest (ROI) of the metastatic lesion on the postcontrast T1-weighted images. The mean values with their standard deviations inside the outlined ROIs and the corresponding ROIs on Ktrans map were calculated. Statistical analyses were used to investigate significant differences between the three series of follow up images.

RESULTS: On the follow-up postcontrast T1-weighted images after radiotherapy, the lesions with decrease and increase in size were defined as stable condition and tumor recurrence, respectively. The preliminary data of Ktrans difference between follow-up images show decrease among the group of stable condition, whereas they show increase among the group of tumor recurrence.

CONCLUSION: This study suggests that Ktrans values tend to correlate with vascular permeability of brain tumor, and could be a predictor for tumor response after radiotherapy.

慢性腦椎靜脈不全：只出現在多發性硬化症嗎？**Chronic cerebrospinal venous insufficiency (CCSVI): is it related only to multiple sclerosis?**

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PURPOSE: Recently, the controversy about the relationship of multiple sclerosis and chronic craniospinal venous insufficiency (CCSVI) is quite popular. The purpose of this study was to determine the incidence of CCSVI in general population and subjects with multiple sclerosis.

MATERIALS AND METHODS: From 1st July 2012 to 30th June 2012, a total of 27368 MR examinations were done for brain study in our institute. Excluded those study did not contained available contrast medium enhanced MRV, evidence of dural sinus thrombosis, and repeated studies done on same subjects, we included 7024 studies in this examination. One hundred sixty one patients diagnosed as multiple sclerosis were examined in the same period. We defined CCSVI as those patients at least with one of the 3 signs on MRV; 1) Venous reflux into the internal paraspinal venous plexus; 2) Significant stenotic or small sized transverse sinus; 3) Significant stenoses of the internal jugular vein distal to the C1-2 level.

RESULTS: A total of 18 patients found to have CCSVI according to the criteria mentioned above. The incidence was 0.26%. Among them, eleven were diagnosed to have multiple sclerosis during the period of MR examinations. The incidence of CCSVI in multiple sclerosis was 6.8% in this particular group. If we excluded those studies done for patients with multiple sclerosis, the incidence of CCSVI in subjects without multiple sclerosis was 0.1% (7/6863).

CONCLUSION: The trend to having CCSVI in multiple sclerosis patients is much higher than the general population.

PT167-BN

因頸部旋轉壓迫右脊椎動脈所導致之右小腦梗塞：病例報告**The Right Cerebellum Infarction Caused by Neck Ipsilateral Rotation Induced RVA Compression and Occlusion: A Case Report**吳蓉俐^{1,2} 渡邊嘉之² 富山憲幸²*Rongli Wu^{1,2} Yoshiyuki Watanabe² Noriyuki Tomiyama²*台北中心診所醫療財團法人台北中心綜合醫院 放射線科¹；日本大阪大學醫學部附屬病院 放射線診斷科²
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INTRODUCTION: Rotation neck may cause vertebral artery (VA) compression and/or occlusion that may lead to vertigo, transient ischemia or even to brain infarction.

CASE REPORT: We report a male who is 40 years old suffering from neck ipsilateral rotation induced right vertebral artery (RVA) compression and occlusion resulting in the right cerebellum infarction. Magnetic Resonance Angiogram (MRA) showed the total occlusion of the RVA had recanalization following days with only conservative treatment. In addition, neck Duplex ultrasonography (US) found rightward rotation in different angles causing different degrees of compression of the RVA. Computerized tomography angiography (CTA) and digital subtraction angiography (DSA) with rotational position results revealed the stenosis located at the level of C6-7, which was an uncommon location of this event.

DISCUSSION: Finally, this report is based on the literatures review and to investigate the factors of this incident happened by using this patient's personal details, clinical courses and his image studies.

可逆性後腦病變症候群獨發於橋腦的病例報告：進階磁共振造影影像 Isolated Pons Involvement in Posterior Reversible Encephalopathy Syndrome: Advanced MRI Imaging

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INTRODUCTION: Posterior reversible encephalopathy syndrome (PRES), also called reversible posterior leukoencephalopathy syndrome (RPLS) usually presents with bilateral white and gray matter abnormalities in the posterior aspects of the cerebral hemispheres. Isolated pons involvement of PRES is rare in the literature. We report a rare case of isolated pons involvement of PRES with imaging manifestations in diffusion-weighted image (DWI), diffusion tensor image (DTI), and magnetic resonance spectroscopy (MRS) in addition to conventional MRI imaging. By these advanced MRI imaging, we can make the diagnosis of isolated pons involvement of PRES earlier and avoid improper invasive treatments.

CASE REPORT: This 44-year-old male had past history of hypertension without medical control for 2 to 3 years. He was admitted to the emergency department because of acute onset of generalized convulsion with consciousness loss and cold sweating. The convulsion duration was about 2 to 3 minutes, and his consciousness gradually recovered in 20 to 30 minutes later. He did not remember the event, and no special discomfort was complained after this episode. His neurological examination was normal, however physical examination revealed his blood pressure was 243/107 mmHg. Computed tomography imaging (CT) showed low attenuation in the pons. Magnetic resonance imaging (MRI) revealed extensive hyperintensity and swelling in the pons with bilateral cerebral peduncles and medullary pyramids extension on T2 weighted and fluid attenuated inversion-recovery (FLAIR) images. However, there was no abnormal lesion detected in either bilateral occipital lobes. DWI was normal at the brainstem, but ADC values were slightly elevated at the lesions corresponding to that on T2 weighted and FLAIR images in the pons. There was no contrast enhancement. The DTI/tractography showed intact white matter tracts in the brainstem without evidence of destruction or displacement. In the MRS peaks, there is no increased ratio of Cho/Cr (choline to creatine) or Cho/NAA (choline to N-acetyl aspartate) to support the possibilities of malignancy. His symptom improved soon after his blood pressure was controlled. A repeated MRI taken one month later showed regression of the pons lesions.

DISCUSSION: Isolated pons involvement of PRES is rare and need to be differentiated from brainstem infarction, pontine glioma, central pontine myelinolysis (CPM), infective encephalitis, and acute disseminated encephalomyelitis (ADEM). Pons infarction was excluded by the lack of major brainstem signs, rapid recovery of clinical symptom, and no lesion in DWI. Although the expansion and mass effect in this case is similar to pontine glioma, the possibility of glioma is low because of intact white matter tracts of the brainstem in DTI/tractography and normal ratio of Cho/Cr and Cho/NAA in MRS. As for CPM, electrolyte imbalances would offer clue for this diagnosis. Although the CSF data was not available in this case, infectious brainstem encephalitis and ADEM were excluded due to lack of clinical radiologic correlation and rapid recovery without specific treatments.

In conclusion, we report a rare case of isolated pons involvement of PRES, and we can make this diagnosis earlier to avoid improper invasive treatments by advanced MRI imaging such as DWI, DTI, and MRS in addition to conventional MRI imaging.

顱內動脈瘤破裂以腦內血腫表現而無蜘蛛膜下腔血腫：病例報告

Intracerebral Hematoma without Subarachnoid Hemorrhage Secondary to Intracranial Aneurysm Rupture: A Case Report

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INTRODUCTION: Cerebral aneurysm rupture rarely results in intracerebral hemorrhage (ICH) without concomitant subarachnoid hemorrhage (SAH). Here, we describe a case of ruptured cerebral aneurysm presenting with only ICH without SAH.

CASE REPORT: A 57-year-old female patient presented with acute onset of conscious disturbance. Computed tomography (CT) showed ICH mainly in the left parieto-temporal lobes, but no obvious evidence of SAH. The CT angiography revealed the presence of a left internal carotid artery aneurysm, which was confirmed by digital subtraction angiography. The patient underwent emergent craniotomy, evacuation of hematoma and coil embolization of the aneurysm. Her neurological symptom gradually recovered with rehabilitation after surgery.

DISCUSSION: Although ICH without SAH is a rare presentation of cerebral aneurysm, ruptured cerebral aneurysm should be considered as a cause of ICH. The radiologic findings and possible mechanism of this presentation are discussed.

PT170-BN

蛋型硬膜下成形血塊：病例報告

Egg-Shaped Huge Encapsulated Organized Subdural Hematoma: A Case Report

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INTRODUCTION: Chronic subdural hematoma is occurred in any age but most common in elderly, and may be encapsulated. The classic imaging appearance is crescent-shaped extra-axial collection that spreads diffusely over affected hemisphere. Chronic subdural hematoma may develop clot lysis, organization, and endomembrane formation. We report a huge egg-shaped organized subdural hematoma.

CASE REPORT: The 80y/o male had a traumatic history because falling down from bed during sleep at Aug 2012. Vertigo developed later sometimes. However, acute exacerbated vertigo made him unable to walk steadily in recent days, and then vomiting was also noted. He visited the neurogenic. In outpatient, his consciousness was clear and intact the cranial nerve functions. GCS was E4V5M6. Lab data was normal, including the whole blood test, bleeding and coagulation times. Chronic subdural hemorrhage was suspected, and cranial computed tomography was performed. It showed a huge left frontotemporoparietal extraaxial lesion with calcification mass and well-defined egg-shaped lesion. The midline was shifted to contralateral side and the brain was compressed. After admission brain MRI was performed, and it demonstrated an extensive resolving hemorrhage with ball-like capsulated mass-like lesion Left hand weakness and tremor developed soon after. Operation was suggested, and craniotomy was performed on 06. 24. 2013. In theater, a huge capsulated mass lesion was confirmed. The microscopy demonstrated the fragments of hematoma with mature organization and surrounded by fibrous capsule, and subdural organized hematoma was found in his pathological report.

DISCUSSION: Chronic subdural hematoma is predominantly a disease of the elderly, and may develop calcification along periphery, typically those present for many years. The most common imaging appearance is crescentic extra-axial collection. Sometimes the CSDH may be confused with the other extraaxial space-occupying lesion, such as epidural hematoma, subdural empyema, and meningioma. MR imaging is more sensitive than CT in detection the size and internal structures of chronic subdural hematoma.

台灣人類狂犬病腦炎：病例報告 Human Rabies Encephalitis in Taiwan: A Case Report

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INTRODUCTION: Rabies is a zoonotic disease with horrible clinical presentation that fears human beings. In 2013, Taiwan announced that the rabies virus had been found in wild ferret-badgers. No case was confirmed of human rabies in Taiwan in 2013 except an imported case from Philippines. In this confirmed case of human rabies, we present clinical presentation and both the CT and MRI features.

CASE REPORT: A 31-year-old man presented with high fever and conscious disturbance was sent to our emergency department. Tracing back his history, he was bitten by dog at right hand and fingers in Philippines 61 days previously. CT of brain was done showed no obvious finding. His neurological status progressively deteriorated. Under suspicion of rabies, the patient was shifted to an isolation room in intensive care unit. Poor respiratory efforts developed and ventilation was administered. The MRI of brain showed hyperintensity in central pons on T2 and FLAIR images. Rabies was proved from saliva sample by Centers for Disease Control. His general condition deteriorated progressively. The patient was not responsive to cardiopulmonary resuscitation and was declared dead on seventh day after admission.

DISCUSSION: The CT or MRI of brain is not routinely performed in rabies due to rapidly deteriorate following the onset of symptoms and classical clinical presentation. However, neuroimaging maybe plays a role in diagnosis of cases with atypical presentation or unknown history. With the combination of clinical history and neuroimaging, rabies can be diagnosed properly.

PT172-BN

急性甲苯中毒：MRI 影像表現 Acute Toxic Encephalopathy Due to Toluene Sniffing: Report of Two Workers in the Same Post with Magnetic Resonance Imaging

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INTRODUCTION: Toluene is a volatile liquid with highly lipophilic properties. Upon inhalation, toluene is rapidly absorbed through the lungs and redistributes to lipid-rich organs with toxic effect predominantly on the central nervous system.

CASE REPORT: Case one, a 29-year-old man factory worker, developed loss of short term memory, seizure, conscious disturbance, generalized muscle weakness, hypokalemia and metabolic acidosis few days later after exposure of toluene. Magnetic resonance imaging (MRI) revealed multifocal deep white matter lesions. Six months later, case two, a 51-year-old man worker in the same factory, was sent to out hospital with similar clinical and MRI presentations as comparing with case one. Both urine samples for toluene intoxication test result positive findings. Both of our cases received conservative treatment and improved the clinical symptoms when discharged.

DISCUSSION: Review of the literatures, few mentioned about the MRI findings at acute exposure of toluene. Two of our cases had similar clinical symptoms and consistent MR findings, including diffuse increased signal intensities involving corpus callosum, bilateral periventricular white matter and tracts, bilateral internal capsules, cerebral and cerebellar peduncles on diffusion weighted images (DWI). There is no typical appearance of chronic toluene intoxication, such as brain atrophy, loss of grey-white matter and significantly increased periventricular signal intensity on T2W sequences. In conclusion we present DWI findings, although not previously described to our knowledge, may be a sensitive tool to use in diagnosis of acute toluene neurotoxicity.

軸外非典型畸胎/類橫紋肌細胞瘤：病例報告

Extra-axial Atypical Teratoid/Rhabdoid Tumor: A Case Report

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INTRODUCTION: Atypical teratoid/rhabdoid tumor (AT/RT) of the central nervous system is a rare, highly aggressive malignancy. It is mostly found in infants and young children and usually presenting over the infratentorial region, including cerebello-pontine angle (CPA), cerebellum and/or brainstem. The following frequent location is over the supratentorial hemispheric and suprasellar areas. Limited literature report that AT/RT occurs at the extracranial location. We present a case with AT/RT at an unusual location.

CASE REPORT: This is a case of 4-month-old boy with one well-defined retrobulbar mass, manifesting as isointensity on T1-weighted image, intermediate intensity on T2-weighted image and avidly homogenous enhancement. The tumor depicts adjacent bone involvement of the right sphenoid wings and right superior orbital fissure as well as mild intracranial extension. Then the case underwent surgical removal and then the pathology proves AT/RT.

DISCUSSION: Atypical teratoid/rhabdoid tumor (AT/RT) is a rare, highly aggressive malignancy in pediatric population. In our case, this rare entity occurs in an unusual location – retrobulbar, so it should be differentiated with pediatric orbital tumors. Clinicians should be aware of the signs of orbital neoplasms because any delay in diagnosis of orbital lesions, even if benign, could lead to vision loss and deformity. Orbital neoplasms reviewed are rhabdomyosarcoma, neuroblastoma metastases, optic pathway glioma, plexiform neurofibroma, leukemia, lymphoproliferative disease, orbital inflammatory syndrome, dermoid and epidermoid inclusion cysts, and Langerhans' cell histiocytosis. Vascular lesions reviewed are infantile hemangioma and venous lymphatic malformation. Although retrobulbar AT/RT is very rare, it may be considered in the differential diagnosis of orbital tumors.

PT174-BN

微囊型腦膜瘤磁振造影之特徵性影像表現：病例報告

Characteristic MRI Appearance of Microcystic Meningioma: A Case Report

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INTRODUCTION: Microcystic meningioma is a rare variant of meningioma showing microcyst formation. We report a case of microcystic meningioma with typical imaging appearance that was diagnosed preoperatively.

CASE REPORT: A 70-year-old woman presented with left upper limb weakness and right hand numbness for half a year. Neurological examination revealed left central facial palsy. MRI of the brain revealed a large extra-axial mass in right parietal lobe with mass effect, causing compression of right lateral ventricle with subalpine herniation to left side. The tumor had a markedly low T1 signal and high T2 signal with internal fine reticular hypointense signal. Prominent peritumoral edema was visible on the T2-weighted images. Contrast enhanced T1-weighted images showed reticular and marginal enhancement. A diagnosis of microcystic meningioma was considered. Subsequently, the patient underwent tumor total tumor resection. Histological diagnosis was microcystic meningioma (WHO grade I).

DISCUSSION: Meningiomas are common benign tumors accounting for 13% to 18% of intracranial neoplasms. They are generally known to be solid tumors and their classical appearance on the computed tomography (CT) scan and magnetic resonance (MR) image usually lead to a correct diagnosis. The incidence of cysts in association with meningiomas is between 4%~7%. That characteristic MRI findings suggestive of microcystic meningiomas are; (1) low signal intensity mass in T1- and high signal intensity mass in T2-weighted images; (2) high incidence of peritumoral edema. (3) Marginal and reticular enhancement on post-contrast T1-weighted images.

前大腦動脈創傷性嵌頓：病例報告
Traumatic Incarceration of the Anterior Cerebral Artery: A Case Report

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INTRODUCTION: We report an extremely rare case of traumatic incarceration of the anterior cerebral artery (ACA) resulting in ACA infarction.

CASE REPORT: A 70-year-old man fell down from 3 meters high and was found unconscious. At the emergency department, he was assessed to have Glasgow Coma Scale (GCS) score of E1M4Vt, anisocoric pupil sizes with absence of light reflex bilaterally, and flaccid limbs except involuntary movement of the left upper extremity. Computed tomography (CT) of the head showed multiple fractures of frontal bones, sphenoid bone and facial bones, multifocal intracranial hemorrhages and low-density changes in the left medial fronto-parietal lobe suggestive of infarction at ACA territory. CT angiography revealed herniation of left ACA A2 segment through the fracture of planum sphenoidale into sphenoid sinus. The intracranial pressure (ICP) monitor was placed and he was transferred to intensive care unit (ICU). Due to poor neurologic prognosis with GCS score of E1M1Vt on the 17th day of admission, Do Not Resuscitate (DNR) was signed after discussion with the family.

DISCUSSION: For a trauma patient with skull base fractures and cerebral infarction, CT angiography is mandatory to demonstrate traumatic vascular complications such as arterial dissection, pseudoaneurysm, arteriovenous fistula, transection, occlusion or incarceration of artery. Surgical or endovascular intervention may be indicated for restoration of cerebral perfusion in specific scenario.

PT176-BN

中顱窩表皮樣囊腫出血在電腦斷層與磁振造影影像的表現：病例報告
Middle Cranial Fossa Epidermoid Cyst with Hemorrhage in the CT and MR
Imaging Findings: A Case Report

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INTRODUCTION: Epidermoid cysts, or pearly tumor, account for approximately 1% of all intracranial tumors. Hemorrhage into an epidermoid cyst is extremely rare.

CASE REPORT: We present a 62-year old male who presented with right temporal headache off and on for about 2 years, and followed by left side weakness and gait disturbance for weeks.

DISCUSSION: Computed tomography revealed a mixed high and low density mass, with a few curvilinear calcifications at its lateral wall. Magnetic resonance imaging showed that the lesion was mainly hyperintense on T1 weighted images with internal heterogeneous hypointense contents, and the hypointense component is hyperintense on T2WI/DWI and hypointense on FLAIR. There is no obvious enhancement on post-contrast image. When complicated with hemorrhage, the preoperative diagnosis of an epidermoid cyst is challenging. The patient underwent total excision of the mass. The CT and MR imaging findings will be presented and discussed.

在有神經學症狀的病人評估其頸動脈鈣化與狹窄之關係
The Correlation between Calcium Volume and Carotid Artery Stenosis in Patients with Neurologic Symptoms

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PURPOSE: Based on the strong correlation of calcium volume with carotid artery stenosis, some studies suggest using carotid calcium volume to diagnose carotid artery stenosis. However, a negligible correlation between calcium volume and carotid artery stenosis was found in symptomatic patients suspected of having carotid stenosis. The aim of this study was to further assess the reliability of using carotid calcium volume for the diagnosis of carotid artery stenosis in symptomatic patients.

MATERIALS AND METHODS: We retrospectively examined carotid CT angiography in 65 patients suspected of having carotid artery stenosis. The Pearson correlation coefficient (r) was used to evaluate the correlation between calcium volume and carotid stenosis degree. Using calcium volume thresholds of 0.03 and 0.06 mL, the diagnostic performance of the calcium volume for determining a stenosis degree of 40% was investigated.

RESULTS: The calcium volume-based evaluation showed a weak correlation with the degree of stenosis on the symptomatic side ($r=0.13$, $P=0.14$) and a moderate correlation with the degree stenosis on the asymptomatic side ($r=0.39$, $P < 0.01$). For both sides, there was a weak correlation ($r=0.29$, $P < 0.01$) between calcium volume and degree of stenosis. To detect a stenosis of 40%, the sensitivity and specificity were 85% and 37%, respectively, for the volume threshold of 0.03 mL and 63% and 57%, respectively, for the volume threshold of 0.06 mL.

CONCLUSION: Similar to a previous study, we found a weak correlation between calcium volume and carotid artery stenosis in patients with neurologic symptoms. The results suggest that in this selected patient population, the evaluation of carotid artery stenosis may not be replaced by the calcium volume.

PT178-HN

利用電腦斷層血管攝影偵測頭頸部癌症出血病人之診斷效果
Detection of Bleeding with CT Angiography in Patients with Head and Neck Cancer

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PURPOSE: This study was designed to evaluate retrospectively the accuracy of CT angiography in the identification of clinically suspected bleeding in patients with head and neck cancer.

MATERIALS AND METHODS: Thirty-nine consecutively registered patients (mean age, 52.7 years; age range, 36-72 years) with clinically suspected head and neck cancer bleeding underwent CT angiography before embolization. CT images were reviewed independently by two neuroradiologists who were blinded to the angiographic findings. Disagreements were resolved by consensus. The diagnosis of active bleeding was made when extravasation of contrast material was identified on CT angiography. Conventional angiography was used as the reference standard. The sensitivity, specificity, positive predictive value, negative predictive value and accuracy of CT angiography in the detection of hemorrhage were assessed.

RESULTS: CT angiography demonstrated active bleeding in 13 patients. With conventional angiography as the reference standard, the sensitivity, specificity, positive predictive value, and negative predictive value of CT angiography in depicting active bleeding were 86% (13/15), 96% (31/32), 92% (13/14) and 93% (31/33), respectively. Findings of CT angiography and the standard of reference were concordant for determining bleeding condition in 36 of 39 patients (92% accuracy).

CONCLUSION: CT angiography performed in patients with clinically suspected head and neck cancer bleeding is feasible and could depict the presence or absence of active hemorrhage in the majority of patients.

磁共振造影在修格連氏症候群腮腺治療變化之研究 MRI Post Treatment Change of Parotid Gland of Sjögren's

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PURPOSE: Sjögren's Syndrome is considered a systemic autoimmune disease with the exocrine glands as main target organs. Cevimeline is indicated for the treatment of symptoms of dry mouth in patients with Sjögren's syndrome. Apparent diffusion coefficient (ADC) can provided biological tissues with the local microstructural characteristics of water diffusion. The purpose of this study is using ADC to analysis of the parotid gland of Sjögren's syndrome response to cevimeline treatment.

MATERIALS AND METHODS: Total 36 subjects with Sjögren's syndrome presented with xerostomia were enrolled. Initial MR imaging was performed before treatment and performed 2nd MR study after 4 weeks of proper cevimeline treatment.

RESULTS: Regarding response to salivary stimulation, there was a significant increase the mean ADC values on pre-cevimeline treatment. Also significant increase the mean ADC values on post-cevimeline treatment. After 4 weeks cevimeline treatment, the salivary secretion response revealing significant increase from 5.3% increase to 11.3%.

DISCUSSION: Our results show that significant increase ADC values after salivary stimulation, which suggest that ADC values can be a monitor of salivary secretion. The salivary secretion response revealing significant increase, which suggest that cevimeline treatment can increase sensitivity of salivary secretion stimulation in Sjogren patient even only 4 weeks follow up. However, this increase in secretion may be transient.

CONCLUSION: ADC values can be a monitor of salivary secretion. DWI able to evaluate response sensitivity of salivary flow of the Sjogren syndrome in post cevimeline treatment.

PT180-HN

腦脊髓液滲漏之可能路徑：病例報告

A Possible Route of CSF Leaks: A Case Report

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INTRODUCTION: CSF leaks refers to any disruption of the arachnoid and dura that allows CSF to escape to an extradural space and can occur anywhere along the craniospinal axis. Nasal CSF leaks can occur spontaneously or as a result of blunt trauma to head, previous sinonasal surgery, or less commonly, after meningitis.

CASE REPORT: We present a case of a three year old boy with history of recurrent meningitis during infancy, who presented with rhinorrhea when playing ipad. CSF leaks was impressed and cisternogram demonstrated no evidence of CSF leaks at anterior skull base. Due to congenital middle year deformity, he underwent surgery at the same admission period, and a stapes defect was seen.

DISCUSSION: A possible route of CSF leaks is postulated to explain his symptoms of CSF leak and clinical findings. A brief review of related literatures will be mentioned.

頸動脈床突韌帶骨化與其臨床意義：病例報告

Ossification of Caroticoclinoid Ligament and Its Clinical Significance: A Case Report

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INTRODUCTION: The caroticoclinoid ligament (CCL) is a dural fold extending between the anterior clinoid process and middle clinoid process. Extensive ossification of CCL may cause compression of the internal carotid artery. Furthermore, for neurosurgeons, removing the anterior clinoid process is an important step during regional surgery; the presence of extensive CCL ossification may increase the risk of carotid artery injury. Therefore, pre-operative imaging studies for the identification of ossified CCL may prove essential to the success regional surgery. Here we present a case of para-clinoid internal carotid artery (ICA) aneurysm with ossification of CCL, which was detected by multi-detector computed tomography (MDCT) reconstruction.

CASE REPORT: A 61-year-old male had a history of hypertension without medication control. A 0.6cm aneurysm at the supra-clinoid portion of left ICA is noted by magnetic resonance imaging (MRI) study during annual health examination. There is no significant arterial stenosis or other vascular abnormality in the intra-cranial and extra-cranial arteries. To prevent rupture, neurosurgeons suggested clipping the aneurysm. Since pre-operation computed tomography angiography (CTA) showed ossification of the left CCL with compression of left ICA, special attention was given during Keyhole pterion craniotomy to avoid injuries to the ICA underlying these ossified ligaments. Finally, the para-clinoid aneurysm was clipped successfully, and the patient was discharged uneventfully after the operation.

DISCUSSION: Due to limitations of conventional Digital subtraction angiography (DSA) and MRI, the best imaging study for ossified CCL is reconstruction via MDCT. The presence of an ossified CCL may cause internal carotid artery compression and thereby increase the risk of vascular injury during skull base surgery. Therefore proper identification of ossified CCL by radiologists on imaging reports is essential to successful surgery.

PT182-HN

創傷病患所偶然發現之單側枕骨髁氣化：病例報告

Incidental Finding of Unilateral Occipital Condyle Pneumatization in a Trauma Patient:

A Case Report

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INTRODUCTION: Pneumatization of the temporal bone and skull base are uncommon, and usually are asymptomatic. We report a case of unilateral pneumatization of occipital condyle incidentally found after head trauma

CASE REPORT: A 21-year-old woman presented with initial loss of consciousness after fall down. She was sent to our ER with clear consciousness and headache on arrival. A head CT showed pneumatization involving the left mastoid process and extending into left occipital condyle, with dense fluid collection and air-fluid level in left occipital condyle. Mild epidural pneumocephalus on inner table of left mastoid process and left occipital bone secondary to linear fracture in left posterior parietal bone was also presented. Due to stable vital signs without neurological deficit, the patient was treated conservatively without surgical intervention. Follow-up CT one week later showed the dense fluid collection in left occipital condyle decreased in density but increased in volume, and the epidural pneumocephalus resolved. She discharged two days later after the second CT study without headache and definite sequelae.

DISCUSSION: Pneumatization of temporal and occipital bone usually is asymptomatic. However, headache, hearing problem, neck pain, or neurological symptoms may be seen in craniocervical hyperpneumatization cases, especially who had trauma history. Various causes for excessive pneumatization have been postulated, including developmental variant, increased middle ear pressure with a possible ball valve mechanism, repetitive Valsalva maneuvers, or high altitudes activity such as flying and skiing. We speculate that our patient has congenital asymptomatic pneumatization of occipital condyle. Familiarization of clinical manifestation and mechanism of temporal bone and basal skull pneumatization can make better judgement for our clinical practice.

多發性骨髓瘤以單一顎骨腫瘤為初始表現：病例報告**Multiple Myeloma with Initial Manifestation as Solitary Mandibular Tumor: A Case Report**陳文彬¹ 林煥章² 董俊良³ 吳文峯¹ 梁恒¹Wen-Pin Chen¹ Hwan-Chung Lin² Chun-Liang Tung³ Wen-Feng Wu¹ Joseph Hang Leung¹戴德森醫療財團法人嘉義基督教醫院 影像醫學科¹ 口腔顎面外科² 病理科³
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INTRODUCTION: Multiple myeloma (MM) is a relatively rare malignant hematological disease, which is characterized by the monoclonal proliferation of plasma cells in the bone marrow. It usually presents with multiple osteolytic lesions in the vertebrae, ribs, pelvic bone and skull. It occurs mainly in men aged 50 to 80 years, with a mean of 60 years. More than 30% of patients with MM develop osteolytic lesions in the jaw. But oral lesions rarely appear with initial manifestation of the disease.

CASE REPORT: A 54-year-old female suffered from right side facial swelling off and on for 5 months. She was referred to our oral surgeon department due to no improvement. The oral examinations showed edematous change over right side retromolar area (#48) with intact mucosa. There were no pain, no fever or chillness, no local heat, no bleeding and no lower lip numbness. The panoramic radiography revealed focal bony destruction over right side ascending ramus of mandible. The head and neck CT scan showed one well-defined enhancing solid tumor mass in the same location. Incisional biopsy was performed and the pathologic diagnosis was plasma cell myeloma. The sequent bone marrow biopsy also revealed the same diagnosis. Then she received chemotherapy and local irradiation according to the treatment of MM.

DISCUSSION: Knowledge of the oral manifestations of MM for the dentist and radiologist is important for early diagnosis of this disease, especially when it initially occurs as solitary tumor in the mandible.

PT184-HN

少見併發症之感染性單核球增多症合併急性上呼吸道阻塞：病例報告**Infectious Mononucleosis Associated with Acute Upper Airway Obstruction as a Rare Complication: A Case Report**

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INTRODUCTION: Infectious mononucleosis is a clinical symptom with pharyngitis, fever, and lymphadenopathy as the classical triad and commonly affects adolescents and young adults who have primary Epstein-Barr virus infection during the second decade of life. Most infectious mononucleosis is usually a benign process, but some fatal complications may occur rarely. Here we present a 12-year-old boy with infectious mononucleosis complicated with acute upper airway obstruction.

CASE REPORT: A 12-year-old boy had difficulty swallowing, snoring and shortness of breath accompanied with high fever, neck swelling and skin rash in few days. Cervical computed tomography showed kissing tonsils, parapharyngeal swelling and marked bilateral neck lymphadenopathy. Hepatosplenomegaly is also found in abdominal sonography. In addition, laboratory findings revealed impaired liver function, thrombocytopenia and lymphocytosis with 25 percent's of atypical lymphocyte in peripheral blood smear. Positive response of specific IgM antibodies against viral capsid antigens of EB virus demonstrated definite acute EB virus induced infectious mononucleosis accompanied with acute upper airway obstruction as a rare complication. After steroid treatment, the upper airway obstructed symptoms diminished and the levels of hematogenous enzymes decreased.

DISCUSSION: Infectious mononucleosis may be associated with several acute complications but usually self-limited and generally mild. However, some rare but potentially life-threatening complications may occur, including splenic rupture (1%) and acute upper airway obstruction (1%) due to severe lymphoid hyperplasia and mucosal edema. Clinicians and radiologist should be aware of the potentially life-threatening complications while infectious mononucleosis is diagnosed.

下噤癌惡性副神經節瘤：病例報告
Hypopharyngeal Malignant Paraganglioma: A Case Report

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INTRODUCTION: Paraganglioma in the hypopharynx is rare. Hypopharyngeal malignant paraganglioma is extremely rare.

CASE REPORT: We present a case of a 51-year-old male with histologically proved malignant paraganglioma in the hypopharynx. The patient presented with body weight loss, dysphagia and productive bloody sputum. A necrotic brownish mass was coughed out during admission.

DISCUSSION: Computed tomography (CT) scan showed a lobulated tumor arising from the posterior wall of the hypopharynx with blurred retropharyngeal fat plane and heterogeneous enhancement. Prominent lymph nodes at bilateral jugular chain and left retropharyngeal space were also noted. Histology of the coughed out necrotic mass showed paraganglioma with atypical features. The patient underwent radiotherapy two months later.

PT186-HN

源自眶下神經的顆粒細胞瘤：罕見病例報告
Granular Cell Tumor Arising from the Infraorbital Nerve: A Rare Case Report

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INTRODUCTION: Granular cell tumor, also known as Abrikossoff's tumor, is an uncommon soft tissue neoplasm, which can occur in any part of the body and probably originate in nervous system. Although mainly locating in the dermis, subcutis or submucosa, granular cell tumor of the peripheral nerve origin is extremely rare.

CASE REPORT: A 29 year-old female noticed a lump in her right cheek for one year. By palpation, a fixed, painless nodule (about 2x2 cm in size) was noted in the deep space of the cheek. The sinus CT revealed a well-defined nodule above the maxilla. Neurogenic tumor is first considered. During surgical excision, the tumor was found arising from the infraorbital nerve. Histopathologic examination yielded a diagnosis of granular cell tumor.

DISCUSSION: Granular cell tumors account for an incidence of 0.5% among soft tissue tumors, and most of them are benign. Through serial immunohistochemical studies, granular cell tumors are currently considered to originate from Schwann cells. To our knowledge, this is the first report of granular cell tumor arising from the infraorbital nerve in the literature.

木村氏症：罕見個案報告與文獻回顧

Kimura Disease: A Case Report and the Review of Literature

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INTRODUCTION: Kimura disease is a rarely seen chronic inflammation with unknown etiology, which is more associated with young Asian male. Clinical presentations are painless, slowly enlarging subcutaneous masses in the head or neck region. Laboratory may show elevated serum eosinophil and markedly elevated serum IgE. Typical images are contrast-enhanced subcutaneous lesions and reactive lymph nodes. Pathologic findings are mainly eosinophil infiltration of lymph nodes with involvement of salivary gland.

CASE REPORT: A 62-year-old male who denied any systemic disease or significant past history before, presented to our outpatient department due to a progressive enlarging mass without tenderness over his right neck for 3 years. Physical examination showed a palpable mass over right side level I and II of neck. Neck MRI was arranged and discovered an infiltrative enhancing submandibular gland with lymphadenopathies over corresponding area of right neck. Laboratory disclosed elevated serum eosinophil, and markedly elevated serum IgE. Pathologic finding was proved to be Kimura disease, which showed eosinophil and plasma cell infiltrated in lymph node with microabscess formation.

DISCUSSION: KD is characterized by a triad of painless, slowly enlarging subcutaneous masses in the head or neck region; blood and tissue eosinophilia; and markedly elevated serum immunoglobulin E (IgE) levels. It resolves spontaneously, or can be treated by conservative therapies such as radiotherapy and medical treatment such as steroids or surgical resection. We completely excised the mass without any other medical therapies or radiotherapy.

PT188-HN

乳突炎併發 Bezold 氏膿瘍：病例報告

Mastoiditis Complicated with Bezold's Abscess: A Case Report

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INTRODUCTION: Bezold's abscess is a rare complication of mastoiditis in which infection spreads deep to the sternocleidomastoid and digastric muscles and throughout the fascial planes of the neck. We present the case of Bezold's abscess in a 32-year-old woman.

CASE REPORT: A 32-year-old woman, with history of intermittent otorrhea and otalgia over the past one year, presented with left subauricular pain for one month. She noticed a mass in the left subauricular region and enlarged lymph nodes were diagnosed initially. Antibiotics were administered orally but her symptoms did not improve. Computed tomography (CT) scans showed extensive opacification of the left middle ear and mastoid air cells, consistent with otitis media and mastoiditis. In addition, there was bone erosion and destruction of the left mastoid tip with a 3.5-cm rim-enhanced abscess between the posterior belly of digastric and the sternocleidomastoid muscles. Bezold's abscess was diagnosed. The patient received parenteral antibiotics, left-sided mastoidectomy, and drainage of the abscess.

DISCUSSION: In 1881, the German otologist, Friedrich Bezold reported the effects of pus escaping through the medial side of the mastoid process into the incisura digastrica as a complication of mastoiditis. Present-day literature describes Bezold's abscess as a neck abscess deep to the fascial planes of sternocleidomastoid and trapezius muscles following the spread of pus through the the mastoid tip. Bezold's abscess may not be clinically palpable and the pus can spread to other spaces, including the retropharyngeal space and the mediastinum. Symptoms are often non-specific, such as fever, otalgia, neck swelling and pain. If Bezold's abscess is suspected, CT is the modality of choice.

侵略性的脊椎血管瘤的影像特徵類似惡性骨腫瘤 Image Features of Aggressive Vertebral Hemangiomas Mimicking Malignant Bone Tumors

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PURPOSE: Vertebral hemangiomas (VHs) are common benign tumors and usually asymptomatic. However, only 1 % of VHs, known as aggressive VHs, may invade spinal canal and/or paravertebral space, therefore mimicking malignant bone tumors. Pre-operative diagnosis is often challenging, resulting in delays in appropriate treatment. The images characteristics of aggressive VHs were evaluated.

MATERIALS AND METHODS: We analyze three patients with histologically proven vertebral hemangiomas. The age of the patients was 17, 48 and 52 years old, respectively. They all had compressive neurologic symptoms related to the tumors. Magnetic resonance images (MRI) and computed tomography (CT) were performed in all patients.

RESULTS: The location of the tumors was in C7-T2, T6-7, and T12-L1, respectively. MRI showed variable signal intensity on T1-weighted images, marked hyperintensity on T2-weighted images. Besides, all of the tumors had variable degrees of extra-osseous extension, resulting in spinal cord compression. The CT done in two patients showed mixed osteolytic and osteoblastic lesions, with coarsened trabeculae. Pathologic fracture was found in two patients. The pre-operative transcatheter arterial embolization of the tumor was performed in one patient. All the patients received surgical decompression with spinal fixation and postoperative radiotherapy. The patients' symptoms improved after the surgery.

CONCLUSION: Aggressive VHs may mimic malignant bone tumor and cause spinal cord compression, resulting neurologic deficit. Combination of MRI and CT is excellent diagnostic tool in the diagnosis of aggressive VH.

以磁共振造影之影像區分結核桿菌感染或化膿性細菌感染之脊椎炎 Differentiation of Tuberculous Spondylitis from Pyogenic Spondylitis

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PURPOSE:

1. Determine the accuracy of MRI for differentiation between tuberculous spondylitis and pyogenic spondylitis.
2. Review the literature of the spinal infection.

MATERIALS AND METHODS:

1. A Retrospect study, we compared MRI findings in 6 patients with tuberculous spondylitis and 6 patients with pyogenic spondylitis.
2. Use a 0.3 Tesla MR machine, both non-contrast and post contrast MR study were done.
3. There are 12 image factors at the disc; vertebral body and paraspinal soft tissue were review and analysis.

RESULTS:

A. The patients with tuberculous spondylitis had a significantly higher incidence of MRI findings as follows.

1. A well-defined paraspinal abnormal signal ([5/6] in tuberculous vs [4/6] in pyogenic).
2. A thin and smooth abscess wall ([4/6] vs [3/6]).
3. Subligamentous spread to three or more vertebral levels ([5/6] vs [3/6]).
4. Posterior element involving (5/6 vs 1/6).

B. Pyogenic spondylitis had a significant incidence of MRI findings as disc destruction and periodical ring enhancement [4/6] in pyogenic vs [1/6] in tuberculous.

CONCLUSION: MR image is a valuable tool in the evaluation of the TB or pyogenic spondylitis.

脊髓動靜脈畸形：病例報告
Spinal Arteriovenous Malformations: A Case Report

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INTRODUCTION: Spinal arteriovenous malformation (AVM) is a rare disease, occurring only one-tenth as frequently as brain AVM. The common pathologic condition is an abnormal shunt between the artery and vein. If the condition is not diagnosed or treated appropriately, the patient may have severe and progressive myelopathy due to persistent venous hypertension caused by the arteriovenous shunt.

CASE REPORT: This 37 y/o female suffered from right drop foot for decades. She came to our OPD hospital for help because progressively worse. Imaging study was arranged and showed T-L spinal AVM. Then she was admitted and angiography for spinal AVM embolization performed.

DISCUSSION: Spinal AVM have rarely been reported, most of which were surgical cases in the early period. The angiographic cure rate was about 70%, and clinical improvement or unchanged status ranged from 80% to 90%.

特發性肥厚性硬脊膜炎：病例報告
Idiopathic Hypertrophic Spinal Pachymeningitis: A Case Report

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INTRODUCTION: Idiopathic hypertrophic spinal pachymeningitis (IHSP) is a rare disorder characterized by chronic progressive inflammatory fibrosis of the dura mater due to unknown etiology. It can cause marked myelopathy so prompt diagnosis and proper treatment is necessary to avoid irreversible neurological damage.

CASE REPORT: A 41-year-old male presented with progressive back numbness, bilateral legs numbness and paraparesis for three months. Neurologic examination revealed sensory and motor impairment below T4 dermatome and hyperreflexia. Magnetic resonance imaging (MRI) showed an extramedullary mass extending from T2-T4 level encompassing spinal cord and extending to left neuroforamen of T2-T3 and T3-T4, with intermediate signal intensity on T1 and T2 weighted images and homogenous enhancement. Surgical exploration was done. During operation, a yellowish dense adherent epidural material was found and then removed. Differential diagnosis included lymphoma, metastasis, meningioma, neurogenic tumor, or other entities. The diagnosis of IHSP was established by pathologic result and exclusion of infectious diseases. His symptoms relieved after surgery and follow-up MRI revealed small residual IHSP one and a half years later.

DISCUSSION: IHSP is a rare form of IHP. The diagnosis of requires radiographic and pathological confirmation, along with exclusion of other known etiologies. On MRI, the typical finding is a dural-based mass of low T2 signal intensity extending over multiple levels with strong peripheral enhancement. In our case which final diagnosis was IHSP, the enhancement pattern was not typically peripheral enhancement described in previous study.

磁振造影於笑氣造成之亞急性脊髓退化的應用：兩病例報告
Subacute Combined Degeneration of the Spinal Cord Following Nitrous Oxide Use:
Role of Magnetic Resonance Imaging: Two Cases Report

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INTRODUCTION: Nitrous oxide (N₂O) abuse has increased among young people. Subacute combined degeneration of the spinal cord (SCD) should be considered as a possible outcome of such abuse.

CASE REPORT: Two young patients were diagnosed with progressive ascending numbness in four limbs or both legs and ataxia. Both of them had been inhaling N₂O for weeks to years. A cervicothoracic magnetic resonance imaging scan revealed long segmental hyperintensity changes at the posterior column of the spinal cord. Serological examination showed a lower normal level of vitamin B₁₂. SCD was diagnosed and the etiology was considered related to N₂O misuse. Their neurological status and neurophysiologic condition improved after vitamin B₁₂ supplementation and cessation of N₂O inhalation.

DISCUSSION: In 1986, R. F. Schilling, et al. reported the neurological manifestation of nitrous oxide anesthesia similar to SCD caused by B₁₂ deficiency. The mechanism of N₂O neurotoxicity is interference with B₁₂ bioavailability and the resulting neurological syndromes are indistinguishable from B₁₂ deficiency due to malabsorption or low dietary intake. MRI findings in SCD show a very typical pattern with T₂ hyperintensity confined to the posterior columns, which may involve the lateral columns and rarely brainstem. Similar hyperintense change in diffusion weighted imaging (DWI) has been reported. SCD either due to N₂O exposure or due to reduced intake of vitamin B₁₂ is a reversible condition, when detected and treated early. MRI can aid a prompt diagnosis of SCD in the N₂O abuse group and early vitamin B₁₂ treatment could avoid irreversible neurologic damages and prevent disability.

PT194-IN

電腦斷層導引下先天顱底頸椎畸形第二頸椎神經根疼痛處置：病例報告
CT-guided C2 Pain Management in Malformations of the Craniocervical Junction:
A Case Report

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INTRODUCTION: Relieve the neck pain caused by craniocervical junction abnormalities.

CASE REPORT: The case of a 43 year-old man, who suffered intractable posterior headache and upper neck pain for 6 years. On admission the patient was fully awake, he complained of severe upper neck pain, and upon clinical examination, presented painful sensation specifically along the distribution of bilateral occipital nerves. The remainder of neurological examination was negative. The patient firmly denied neither any history of previous traumas in the cervical spine region nor any surgical operations. Under CT guided pulsed radiofrequency treatment (PRFT) was employed to alleviate the pain.

DISCUSSION: A craniocervical computed tomography (CT) scan showed evidence of bony abnormalities of the craniovertebral junction (CVJ); radiographic findings include dysgenesis of the occiput, atlas and axis associated with the cervical spine deformity-hemivertebra and block vertebra. Of importance, is that the anatomic diagnostician be aware those atlanto-occipital and atlanto-axial osseous anomaly presentation. We will present the C2 nerve root management under CT guidance and relevant anatomy.

急性脊椎動靜脈瘻管成功栓塞後造影劑外漏：病例報告**Acute Extravasation of Contrast Medium after Successful Embolization of Spinal Arteriovenous Fistula: A Case Report**

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INTRODUCTION: Endovascular embolization with liquid embolic agents is an option for treatment of spinal arteriovenous fistula (SAVF). We present two unusual cases of acute contrast extravasation during follow up angiography after endovascular embolization of SDAVFs.

CASE REPORT: Two patients had history of chronic SAVF status post-endovascular embolizations for times. They received embolizations recently due to recurrent symptoms. The endovascular treatments (one used Onyx, another used NBCA) were successful and uneventful. However, the final angiograms showed vasospasm of the navigated radicular artery apices and acute extravasations of contrast medium. Fortunately, the patients did not complain of back pain and neurologic deficits.

DISCUSSION: Liquid agents are the most used material for embolization of the SAVF. The routine final angiogram should be caution for vasospasm.

使用動脈內緩慢注射依非巴特藥物以重新開通中大腦動脈的急性梗塞**Re-opening of Acute Occlusion of the Middle Cerebral Artery Using Intra-arterial Slow Injection of IIb/IIIa Medication – Integriline**

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INTRODUCTION: This 60-year-old male patient admitted because of 80% stenosis of proximal left internal carotid artery (ICA). His right carotid artery and bilateral vertebral arteries are not patent. And the posterior circulation received blood supply via the persistent primitive trigeminal artery from the left ICA. Therefore, the left ICA is the sole blood supply to the whole brain. The angioplasty of left ICA was then highly suggested.

CASE REPORT: This 60-year-old male patient was performed the angioplasty procedure under local anesthesia, with Filterwire protection using a 3*20mm PTA balloon catheter. Occlusion of M1 segment of the left middle cerebral artery was found after angioplasty and the patient became unconscious and uncooperative. The M1 segment and one M2 branch was re-opened successfully after slow injection of 15 mL and 20 mL Integriline inside the left common carotid artery, followed by superselective injection of 10 mL Integriline in the M1 segment. The patient regained consciousness after reopening of the M1 segment. Another 20mL was delivered more in M1 segment because of presence of thrombus in one branch of M2 segment. Then stenting & post-dilatation of the carotid stenosis was performed additionally to enhance flow to the left middle cerebral artery. After the procedure, the patient was transferred to medical intensive care unit. He remained clear in consciousness and free from new neurological deficit after the procedure. Computed Tomography performed after 3 days showed no new infarct. He remained in the intensive care unit for 4 days, and then in the usual ward for 2 more days after stenting. He was discharged from our hospital without new stroke or new neurological deficit.

DISCUSSION: Retrospectively, the cause of acute occlusion of middle cerebral artery (MCA) was due to lack of routine initial bolus injection of heparin before the interventional procedure. However, the Integrilin, as a platelet glycoprotein (Gp) IIb/IIIa receptor antagonists, plays an important role of re-opening of acute occlusion of the middle cerebral artery.

脊髓圓錐動靜脈畸形以歐尼斯液態栓塞系統栓塞：病例報告
Conus Medullary Arteriovenous Malformation embolized with Onyx: A Case Report

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INTRODUCTION: Conus medullaris arteriovenous malformation (CMAVM) is a new category of spinal arteriovenous malformation (SAVM) first defined by Spetzler et al in 2002, however only a few new cases have been reported with this new term thereafter.

CASE REPORT: We report a 37-year-old female patient who had progressive right foot weakness in 5 years and became palsy with drop foot in recent 2 years. Spinal angiography reveals a CMAVM with multiple direct arteriovenous shuntings from right L1, L4 and left T12, L1 radiculopial arteries to the dilated perimedullary veins at T12 level with a hugely dilated and distorted L5 great radicular vein drains along the cauda equina from L1 to L5 level. The distended venous varices compressing the right L5 and S1 nerve roots result in her right foot palsy. It is the first CMAVM case present with such symptom. Onyx is a newly introduced liquid embolic material consisting of ethylene vinyl alcohol polymer dissolved in dimethyl sulfoxide (DMSO). In 1990, Onyx was first reported as an embolizing agent for cerebral AVMs. Currently, Onyx has been mainly applied to the cerebral or, to some extent, the peripheral AVMs, including limb and visceral AVMs. However, experiences of using Onyx in spinal cord AVM or AVF are limited.

DISCUSSION: In our case, we use Onyx as the embolic material for the CMAVM of the patient; however, the cauda equina syndrome happened immediately after the embolization. Surgery revealed the Onyx-filled venous nidus around the nerve root of the cauda equine. We believed that the cauda equina syndrome was due to the mass effect on the Onyx inside venous nidus channel. In the literature, the mass effect of the Onyx in the nidus was rarely discussed. The slow injection rate and the better penetration provide the higher rate of the nidus obliteration by the Onyx, which seems the advantage of the Onyx embolization. On the contrary, this advantage in our case may induce the cauda equina syndrome. Therefore, in case of CMAVM, especially in the large nidus/venous pouch, near total occlusion by the Onyx could make more mass effect and more neurological deficit. The subtotal occlusion by the n-BCA may be a better strategy than Onyx.