

INFECTED URACHAL CYST IN AN ADULT: IVU, US AND CT FINDINGS

Su-Tso Yang Jau-An Chen

Department of Radiology, China Medical College Hospital

A case of infected urachal cyst in an adult presenting as an erythematous suprapubic mass was demonstrated by the intravenous urography (IVU), ultrasonography (US) and computed tomography (CT). This report illustrated the value of complete radiologic evaluation in establishing the diagnosis and surgical planning of urachal cyst. IVU disclosed upward tenting of the bladder dome. US showed a cystic mass between bladder dome and anterior abdominal wall. CT gave the best delineation of the anatomical location of the cyst with sagittal reconstruction and intravenous contrast enhancement.

Key words: Urachus; abdomen, cysts

INTRODUCTION

Urachal cysts are retention cysts of the urachal remnants that are closed at both cephalic and caudal ends but patent in the midportion [1]. The incidence of urachal cysts in an autopsy series was 1 in 5,000 [2], but symptomatic, clinically significant urachal cysts with secondary infection or in large size as the main manifesting feature are uncommon [2]. Although a little more than 100 cases of urachal cysts have been reported in the literature, few papers stressed the importance of radiologic evaluation [3]. The specific interest of the case presented here is the complete radiologic workup of an infected urachal cyst in an adult with emphasis on the findings of computed tomography (CT).

CASE REPORT

A 28-year-old Oriental man complained of an one-week history of fever, chills, dysuria, burning sensation during urination, and suprapubic pain. He was initially treated by his family physician as urinary tract infection with oral antibiotics. The symptoms subsided but recurred with an additional feature of erythematous suprapubic mass. On admission to our hospital, physical examination revealed a hard, tender, lower mid-line abdominal mass about 4 X 5 cm in size. Complete blood count showed leukocytosis (10090/mm³) with neutrophil predominance (79%). Urinalysis and urine culture were negative. Cystoscopy only noted external compression over the posterior aspect of the bladder dome.

Intravenous urography (IVU) was given

as the initial imaging modality for the screening of urinary tract infection and demonstrated a pear-shaped bladder on the AP view (Fig. 1A). In left posterior oblique view, there was an upward tenting of the bladder dome in its anterior aspect (Fig. 1B). Then, pelvic ultrasonography (US) was used to evaluate the relationship between the bladder dome abnormality and the tender suprapubic mass found on physical examination. It showed a 4.5 X 3 cm cystic mass with complex echogenicity between the bladder dome and the anterior abdominal wall in right paramedian longitudinal section (Fig. 2). CT with 8 mm axial section and intravenous contrast enhancement confirmed the findings of US. It

further disclosed the nature of the lesion to be a unilocular cyst with thick wall (Fig. 3A). The cyst did not communicate with the bladder because of the absence of contrast medium filling. Sagittal reconstruction best depicted its anatomical location to be anterior to the peritoneal cavity, posterior to the rectus abdominis muscles in close contact with the transversalis fascia, above the bladder dome, and below the level of umbilicus (Fig. 3B).

Under the preoperative impression of infected urachal cyst, the patient underwent complete excision of the urachal remnant and recovered uneventfully. Pathologic findings of the specimen were compatible with those

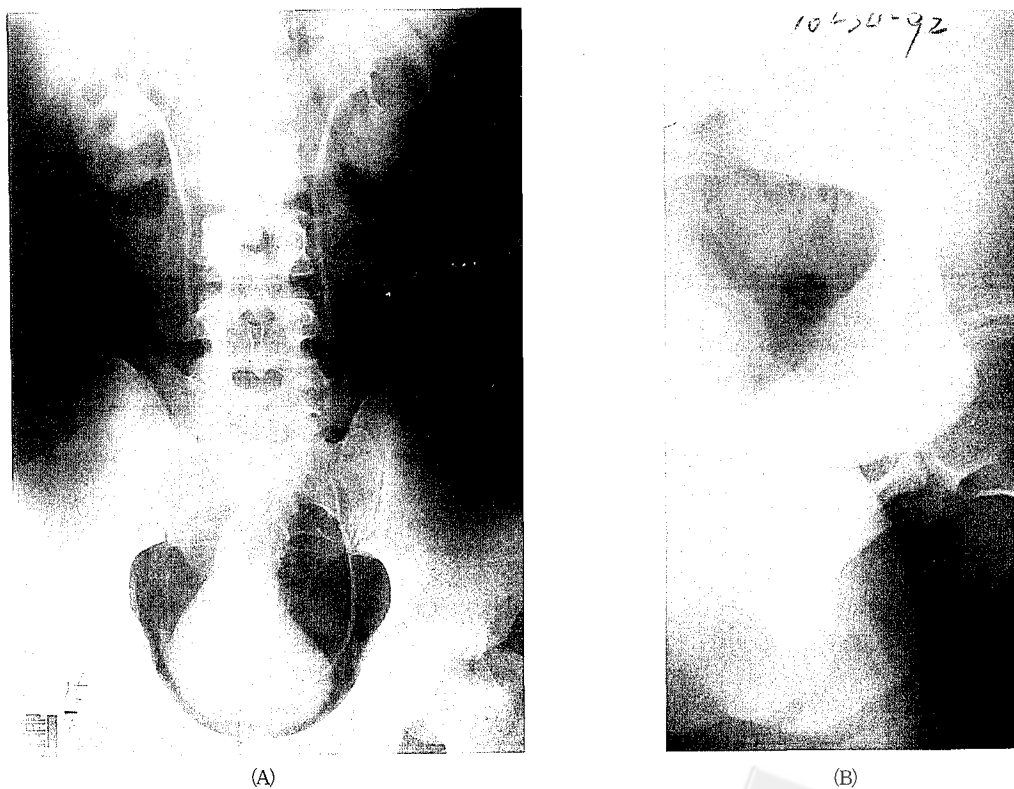


Fig. 1. IVU.

- A. AP view showing a pear-shaped urinary bladder.
- B. LPO view showing upward tenting of the anterior aspect of the bladder dome toward umbilicus.

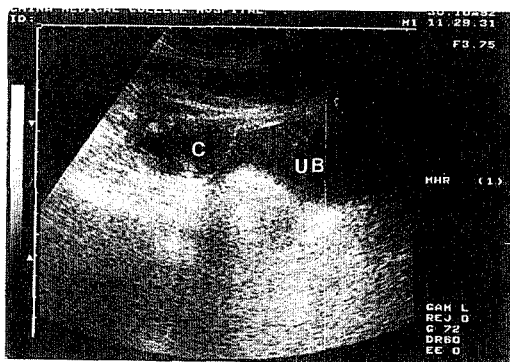
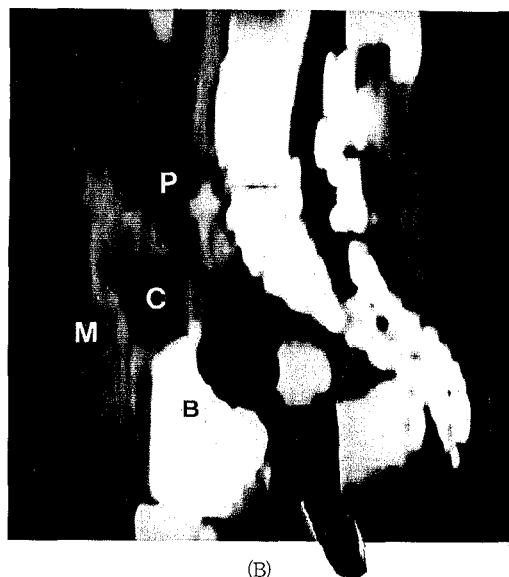
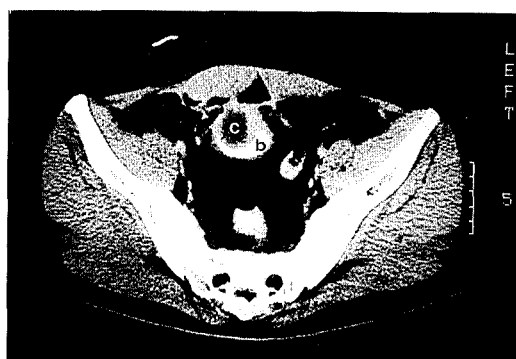


Fig. 2. Sonogram with longitudinal section: a cystic mass (C) with mixed echogenicity between the bladder (UB) and anterior abdominal wall.



(A)

(B)

Fig. 3. CT scan.

- A. Axial transverse section depicting a unilocular cyst (c) with thick wall above the bladder dome (b).
- B. Sagittal reconstruction revealing its exact anatomical location. The cyst (C) is above the bladder dome (B), anterior to the peritoneal cavity (P), and posterior to the rectus abdominis muscles (M).

of an infected urachal cyst. No malignant transformation was observed.

DISCUSSION

Correct preoperative diagnosis of infected urachal cyst was difficult with conventional imaging modalities before the availability of ultrasound scanners [3]. If left undiagnosed and untreated, serious complications such as peritonitis by intraperitoneal rupture, intestinal obstruction, urinary tract

infection, hemorrhage and malignant degeneration may occur [2].

Regardless of the inadequacy in establishing the diagnosis of urachal cyst, IVU should always be included in the radiologic evaluation because of the possibility of associated genitourinary anomalies [4]. This is specially true for patients with symptoms of urinary tract infection. Because the cyst does not communicate with urinary bladder, the findings on IVU are indirect features such as extrinsic compression and irregular margin

of the bladder dome, and upward tenting of the bladder toward umbilicus [5,6]. They should have heralded the presence of a lesion above the bladder dome and the need for further imaging studies. Aside from IVU, other conventional imaging modalities such as fistulography and sinography are useful only in cases with umbilical drainage [5].

The essential step in the radiologic assessment would be pelvic US. It is ideal for diagnosis because the lesion is cystic, extraperitoneal and located in the anterior abdominal wall away from the interference of intestinal gas [3]. Also, the filled bladder serves as a good reference point in the pelvis. US has no radiation exposure, and provides information concerning the size, nature and location of the cyst [3]. For noncomplicated, infected urachal cysts in young adults, the radiologic workup may stop here if the lesion is clearly shown [3].

CT is superior to US in the demonstration of extent of involvement. This is especially true for the cases with serious complications. The exquisite quality of the sagittal reconstruction of transverse CT sections in the delineation of the anatomical location has never been mentioned in previous reports. With the aid of intravenous contrast enhancement, the sagittal reconstruction can exclude the possibility of patent urachus and vesicourachal diverticulum on the basis of absence of contrast medium filling in the cystic structure. For small-sized cysts, US may be negative whereas CT findings are characteristic [7]. For elder patients, the possibility of urachal carcinoma must be ruled out. CT can provide additional differential feature about adjacent lymph node involvement which is not available with US [8]. Regarding the above-mentioned qualities, CT is certainly a better tool than US for surgical planning. Besides, newer imaging modalities such as magnetic resonance imaging cannot offer

more information than that provided by CT [2].

When symptomatic, the list of differential diagnosis for infected urachal cyst could be long. It may include the following: (A) intestinal diseases such as acute appendicitis, Meckel's diverticulum, Crohn's disease and infected duplication cyst; (B) problems in the anterior abdominal wall like hematoma and abscess; (C) diseases in the space of Retzius such as infected suture granuloma and urachal carcinoma; and (D) pelvic lesions like bladder diverticulum, ovarian cyst and abscess. Omphalitis or umbilical granuloma is considered only when umbilical drainage is present [7]. With the ability to depict the nature and location of the cyst, US can show direct characteristics of the lesion and narrow the scope of differential diagnosis to the diseases in the space of Retzius. In contrast, infected suture granulomas must have history of previous inguinal surgery, and differentiation between infected thick-walled urachal cyst and urachal carcinoma may be difficult. Then, CT can intervene with its ability to show direct invasion of the surrounding structures, adjacent lymph node involvement and secondary deposits [2].

Compared with the cystoscopic finding in our case, US and CT clearly gave more accurate description of the anatomical relationship between the lesion and the bladder dome. The incorrect cystoscopic description may result from incomplete distention of bladder during cystoscopy and use of narrow-angled cystoscope.

Correct radiologic assessment of the infected urachal cyst enables accurate surgical planning with useful information concerning the size and location of the cyst, the extent of localized inflammation, and the possibility of intraperitoneal spread. With CT findings suggestive of the chance of urachal malignancy, fine-needle biopsy and cytological examina-

tion of the cyst fluid should precede any major surgery. Also, radical excision plus adjuvant chemotherapy instead of wide excision would be applied when urachal malignancy is confirmed.

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發炎性臍尿管囊：靜脈腎盂攝影、超音波及電腦斷層之表徵

楊仕哲 陳昭安

中國醫藥學院附設醫院放射線科

一位成人在臨床上的表現是恥骨聯合上方有一紅腫的硬塊，靜脈腎盂攝影、超音波及電腦斷層顯示其為發炎性臍尿管囊。此篇病例報告揭示完整的放射線學檢查對於確立臍尿管囊的正確診斷及手術規劃有重要的價值，靜脈腎盂攝影顯露出膀胱頂部的向上突起現象，超音波可顯示一個囊腫位於膀胱頂部與前腹壁之間，電腦斷層則可以矢狀面影像重組及靜脈顯影劑注射，對囊腫的解剖學位置提供最佳的描述。

關鍵詞：臍尿管，腹部囊腫。

