Can Multiparametric MR Imaging Of Prostate Replace Transperineal Ultrasound Guided Stereotactic Mapping Biopsy In Detection Of Tumour Foci In Early Prostate Cancer ?

PT173-GU

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BACKGROUND AND AIMS: To compare the performance of multiparametric MR imaging of prostate with ultrasound guided robotic stereotactic transperineal mapping biopsy in the detection of tumour foci in low risk early stage prostate cancer by Epstein criteria.
METHODS: Institution's IRB approval was obtained for this prospective study. Patients with low risk prostate cancer (not more than cT2, PSA < 10 ng/ml, Gleason score = 3+3) by ultrasound guided robotic stereotactic 24-core transperineal mapping biopsy underwent T2W, DWI, H-1 Spectroscopy, and DCE MRI at 1.5T with endorectal coil to yield parameters ADC, T2, Spectroscopy and DCE MRI data with 5 precontrast and 60 postcontrast scans at a time-resolution of 8 s.
RESULTS: 20 tumor foci were detected on robotic mapping biopsy on 18 patients (mean age, 64 years; range, 59-74 years). 7 suspicious foci were detected on multiparametric MRI, of which 6 corresponded to those detected on mapping biopsy. One focus was detected only on MRI but not on biopsy. The best performing single MRI parameter is ADC from which all 7 foci were detected.
CONCLUSION: Multiparametric MRI detects only 35% of low grade prostate cancer foci detected on mapping biopsy. It cannot replace transperineal mapping biopsy for localization of tumor foci for focal therapy in early prostate cancer.

Use MRI to Localize Prostate Cancer before Re-Biopsy in Patients with Persistent High PSA and Previous Negative Biopsy

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BACKGROUND AND AIMS: To assess the use of pre-biopsy multi-parametric magnetic resonance imaging (MRI) for prostate cancer localization in patients who have at least one round previous negative biopsy but persistent high prostate specific antigen (PSA) level.
METHODS: This retrospective study included 57 patients with persistent elevated PSA levels and previous negative biopsy who underwent multi-parametric MRI including T2WI, diffusion weighted imaging and dynamic contrast enhanced imaging before biopsy. We graded the likelihood of cancer based on PI-RADS (prostate imaging, reporting, and data system). Imaging data were compared with histological results on biopsy or prostatectomy. Age, PSA level, free-to-total PSA ratio, total prostate volume, PSA density (PSAD) and PSA transition zone density (PSATZD) based on prostate volume measured by MRI were analyzed. A p value less than 0.05 denoted as statistical significance.
RESULTS: There were 29 patients underwent TRUS biopsy after multi-parametric MRI and 5 (17%) patients proved had prostate cancer. The cancers located mainly in apex, anterior horn of peripheral zone (n=2) and transitional zone (n=3). These lesions had scores more than 4 on PI-RADS in all parametric MRI. Fifteen patients have none conclusive results due to loss of follow up (n=9) or image highly suspect malignancy but biopsy remain negative (n=6). There are significant difference in age (p= 0.02) and PSAD (p= 0.039) between patients with prostate cancer and patients with a negative result in image or biopsy (n=37). There are also significant difference in total prostate volume (p=0.03) and PSATZD (p= 0.017) between patients with prostate cancer and patients with big transitional zone and had a negative result in image or biopsy (n=27).
CONCLUSION: Pre-biopsy MRI helps to detect prostate cancer in patients with negative results of previous biopsy but had persistent high PSA level, especially in older patients who had higher PSAD. Lesions with higher PI-RADS scores have more tendencies to be proved as malignancy. However, there are some limitations by visible fusion between MRI and TRUS images to guide biopsy, especially for patients who had big prostate volume with big transitional zone and had equivocal tumors (PI-RADS score 3) in transitional zone.