MR Imaging and Three-dimensional H-1 MR Spectroscopic Imaging for Recrudescence of Lower Urinary Tract Symptoms after Transurethral Resection of the Prostate

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Introduction

After the operation of transurethral resection of the prostate (TURP), the symptom of lower urinary tract symptoms (LUTS) can reappear due to recurrent BPH or other prostatic disease, especially the prostatic carcinoma (Pca). The purpose of this work was attempted to determine the value of MRI and three-dimensional H-1 MR spectroscopic imaging in the diagnosis of the cause of LUTS after TURP.

Materials and Methods

14 cases of post-TURP patients with LUTS caused by prostatic disease; including 8 cases of Pca, 5 of BPH, and 1 of transitional cell carcinoma of prostatic urethra confirmed by histopathology of operation or biopsy were evaluated by pelvic or endorectal MRI. The results were compared with 14 cases of patients, with TURP performed within 6 months without LUTS. 7 cases were furthermore evaluated by endorectal MRI and three-dimensional H-1 MR spectroscopic imaging (3D ^{1}H MRSI); including 4 of Pca and 3 of BPH.

Results

The length the widened prostatic urethra and the width of the inner outlet of bladder of the LUTS team (1.66cm±0.75cm and 0.97 cm±0.50 cm) were statistically shorter than those of the compared team(2.64cm±0.61cm and 1.71 cm±0.87 cm) caused by compression and displacement of prostatic disease. The results of 3D ^{1}H MRSI showed that the average ratios of Cho+Cre/Cit in the regions of cancer (2.21±0.79) were statistically higher than those of the normal prostate tissue (0.56±0. 13) and those of BPH (0.63±0.17). The diagnostic accuracy of MRI was 11/14(78.57%). The diagnostic accuracy of 3D ^{1}H MRSI was 6/7(85.71%).

Conclusion

The results of this study demonstrated that MRI possesses the capability to observe the related changes of prostate and the prostatic urethra after TURP[1]. A relatively high accuracy can be achieved by using MRI and 3D 1H MRSI to diagnose the recrudescence of LUTS caused by residual or recurrent disease of prostate after TURP.

Reference

1 Sheu, Ming-Huei; Chiang, et.al. JCAT 2000; 24(4):596-599

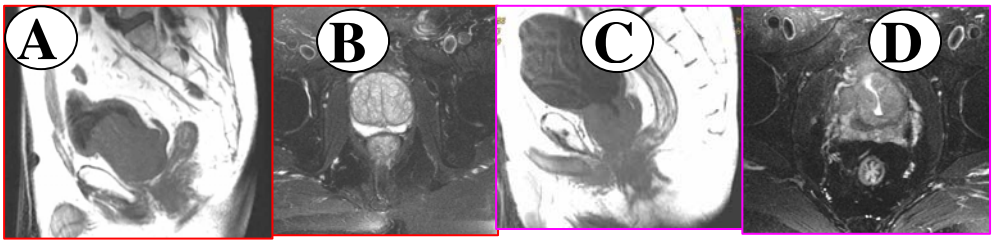

FIG. 1 6 year after TURP, the symptom of LUTS reappears in a 68-year-old man. **A:** Sagittal T1-weighted (fast SE, 600/30) MR image. **B:** Axial T2-weighted (fast SE, 2,000/90) MR image shows the characteristic of typical BPH which was confirmed by second TURP.

FIG. 2 12 year after TURP, the symptom of LUTS reappears in a 78-year-old man. **C:** Sagittal T1-weighted (fast SE, 600/30) MR image. **D:** Axial T2-weighted (fast SE, 2,000/90) MR image shows a nodule of low T2 signal intensity protruded to the prostatic urethra which confirmed as prostate cancer by histopathology of biopsy.

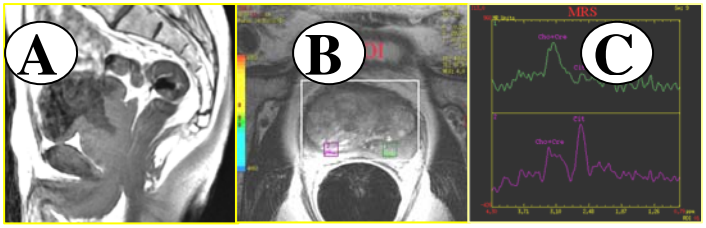

FIG.3 3 year after TURP, the symptom of LUTS reappears in a 72-year-old man. **A:** Axial T1-weighted (fast SE, 600/30) MR image. **B:** Axial T2-weighted (fast SE, 2,000/90) with VOI of ^{1}H MRSI. **C:** MR spectra were obtained with PRESS volume excitation with BASING water and lipid suppression (1000/130,16×8×8chemical shift imaging,100×50×50-mm field of view, 6.25-mm resolution, one signal acquired). Spectra of left PZ (VOX 1) exhibit elevated choline and reduced citrate peak, and ratios of Cho+Cre/Cit was 4.10. Spectra of right PZ and CG (VOX 2) show normal choline and citrate peak, and ratios of Cho+Cre/Cit was 0.53.