Comparison of Transrectal Ultrasound-guided Biopsy of the Prostate and Transurethral Resection of the Prostate for Detection of Prostate Cancer in Patients With Moderate Lower Urinary Tract Symptoms

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Background: To compare transrectal ultrasound (TRUS)-guided biopsy of the prostate and transurethral resection of the prostate (TURP) for detection of prostate cancer (PCa) in patients with moderate lower urinary tract symptoms (LUTS) by retrospective chart review.

Methods: Between January 2004 and December 2008, a total of 520 patients, aged 50.3–81.5 years, with moderate LUTS (International Prostate Symptom Score, 8–19), and elevation of prostate-specific antigen (≥ 4 ng/mL), or abnormal findings by digital rectal examination, were enrolled for evaluation. All the patients were recommended to receive TRUS-guided biopsy of the prostate (TRUS biopsy group) or TURP (TURP group) due to the possibility of PCa, according to their choice after full explanation by the doctors.

Results: There were 379 patients in the TRUS biopsy group and 141 in the TURP group. PCa was detected in 80 patients (21.1%) in the TRUS group and in 27 (19.1%) in the TURP group. Clinically localized PCa (T1–2N0M0) was found in 46 patients (57.5%) in the TRUS biopsy group and in 16 (59.3%) in the TURP group. Bone metastasis was noticed in 22 (27.5%) patients in the TRUS biopsy group and in 7 (25.9%) in the TURP group. The percentage of low-grade tumor was significantly higher in the TURP group than in the TRUS biopsy group (11.1% *vs.* 5%).

Conclusion: TURP was not superior to TRUS-guided biopsy of the prostate for detection of PCa in patients with moderate LUTS and prostate-specific antigen ≥ 4 ng/mL. [*J Chin Med Assoc* 2010;73(11):568–572]

Key Words: prostate cancer, prostate-specific antigen, transrectal ultrasound biopsy, transurethral resection of the prostate

Introduction

Prostate cancer (PCa) is a leading cause of male cancer mortality in the USA.[1] Diagnosis of PCa can be made by transrectal ultrasound (TRUS)-guided biopsy of the prostate or transurethral resection of the prostate (TURP). Prostate-specific antigen (PSA) has been proved to be a very useful tumor marker for the prostate, but it is not specific for PCa.[2] An abnormal digital rectal examination (DRE) and/or elevated serum PSA can indicate PCa. The technique of TRUS-guided biopsy of the prostate has changed from the sextant biopsy in 1980 to saturation biopsy nowadays. It is suggested that the more biopsy cores that are taken, the more cancer one finds.[3] Most PCa is located in the peripheral zone, which is easily confirmed by TRUS-guided biopsy, but it is hard to diagnose PCa in the transitional zone.[3,4] Therefore, biopsies in the transitional zone of the prostate have been suggested for patients with elevated PSA and negative results from extended

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multisite biopsies.[5–7] Puppo et al have suggested that diagnostic TURP has a high diagnostic power for PCa,[8] but risk of morbidity with TURP should not be ignored.[3] However, other authors have reported a lower diagnostic yield (range, 20–30%) for TURP.[3] Kitamura et al concluded that many cancers diagnosed by TURP might be clinically insignificant.[9]

van Renterghem et al reported that their patients with mild lower urinary tract symptoms (LUTS), elevated PSA and negative multisite biopsies underwent TURP, and 9.8% of them had PCa.[10] Patients with moderate LUTS [International Prostate Symptom Score (IPSS), 8–19] and elevated PSA (≥4 ng/mL) or abnormal findings by DRE are recommended to receive TRUS-guided biopsy of the prostate or TURP, but which procedure is better for diagnosis of PCa needs further evaluation. To compare TRUS-guided biopsy of the prostate and TURP for diagnosis of PCa in patients with moderate LUTSs, we conducted a retrospective study.

Methods

PSA, DRE, TRUS and IPSS were routinely checked for evaluation of all the patients (age ≥50 years) with LUTS, and TRUS was performed by using real-time scanning with a rotating 7.5-MHz transducer (Bruel & Kjacer, Copenhagen, Denmark) at our hospital. Between January 2004 and December 2008, 601 patients with moderate LUTS (IPSS, 8–19) and PSA ≥4 ng/mL, or abnormal findings by DRE (such as palpable nodule or hard consistency), were included for evaluation. All the patients were initially treated with α-blocker, and no patients received 5α reductase inhibitor. Eighty-one patients with a history of acute urinary retention, acute prostatitis, urethritis, or refusal to undergo further examinations were excluded. The remaining 520 patients, aged 50.3–81.5 years, satisfied the inclusion criteria and were enrolled for evaluation. These 520 subjects were recommended to receive TRUS-guided biopsy of the prostate (TRUS biopsy group) or TURP (TURP group) because of the possibility of PCa, according to the patients' choice after full explanation by the doctors. Patients in the TURP group did not have previous biopsy, and they chose TURP because there was no specific improvement or side effects after α-blocker treatment. PSA was checked every 3–6 months for patients without PCa in the TURP group, and patients were recommended to receive biopsy if an increase in PSA was noticed. Prostate volume was measured by TRUS, with the formula being 0.52 × length × width × height.

Biopsy of the prostate was done with a spring-loaded automatic biopsy gun under TRUS guidance and local anesthesia (application of xylocaine jelly over the rectum). We used 12-core biopsy including 6 laterals, 2 from the transitional zone and 4 from the lateral peripheral zone, in addition to the conventional sextant biopsies, as described by Durkan et al to detect PCa.[5] Repeated biopsy was recommended if high-grade prostatic intraepithelial neoplasia or increased PSA (higher than previous level) was noted 6 months after the first negative biopsy. A continuous-flow resectoscope was used to perform TURP until the surgical capsule was found (nearing perforation), without suprapubic cystostomy drainage. All surgical specimens were weighed and sent for pathological examinations. Bone scanning (whole-body bone scintigraphy) and computed tomography or magnetic resonance imaging were performed in all the patients for clinical staging when PCa was confirmed. Tumor grading was classified as low (2–4), intermediate (5–7) or high (8–10) according to the Gleason score. Clinically insignificant PCa (T1N0M0) was defined as low-grade tumor, PSA <10 ng/mL, <5% of PCa in the resected tissue by TURP, and no evidence of metastasis. The study was approved by the institutional review board of Taipei City Hospital.

The χ^2 test and Mann–Whitney U test were used for statistical analysis, with $p<0.05$ considered to be statistically significant.

Results

Of the 520 patients, 379 (72.9%) were in the TRUS biopsy group and 141 (27.1%) in the TURP group. PCa was detected in 80 (21.1%) patients in the TRUS biopsy group and in 27 (19.1%) in the TURP group. The baseline characteristics of all 520 patients and 107 with PCa are illustrated in Table 1. No significant differences in age, PSA, IPSS and prostate volume were noted between the 2 groups (Table 1). Patients in the TURP group had lower maximal urine flow rate than those in the TRUS biopsy group (12.5 ± 3.7 *vs.* 12.9 ± 4.1 mL/sec; Table 1), but the difference was not significant ($p=0.63$). The mean number of TRUS-guided biopsies that were undertaken in 80 patients with PCa was 1.4 (1 in 52 patients, 2 in 22, 3 in 5, and 4 in 1). Of 299 subjects without PCa in the TRUS biopsy group, 30 had undergone prior biopsy at another hospital, and the number of biopsies was 1 in 199, 2 in 80, and 3 in 20 patients. The mean weight of TURP specimen was 28.9 g (range, 13–53 g). The PCa detection rates were 0%, 12.1%, 17.9%, 21.6% and 53.4% in the TRUS biopsy group and 6.8%,