Pathology and Quality of Life Outcomes Following Office-based Transperineal Prostate Biopsy

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OBJECTIVE To report the incidence of prostate cancer diagnosis and quality of life outcomes following transperineal prostate biopsy.

METHODS Forty-six consecutive patients underwent office-based transperineal prostate biopsy for an elevated prostate-specific antigen and a normal digital rectal examination without prior prostate biopsy. Prior to biopsy, a repeat prostate-specific antigen was obtained to ensure persistent elevation. Silodosin (8 mg daily) was initiated the day prior to biopsy and continued for 1 week. A total of 18-20 biopsy cores were obtained per patient. All patients responded to a visual analog scale ranging from 0 to 10 immediately following the completion of both the local anesthesia and the biopsy procedure. In addition, an International Prostate Symptom Score (IPSS), Rectal Function Assessment Score, International Index of Erectile Function, Center for Epidemiologic Studies Depression Scale, and postvoid residual were obtained at baseline and 30 days following biopsy, except IPSS which was also obtained at day 7.

RESULTS The mean patient age was 63.3 years with a mean prostate volume of 41.8 cm^3. The mean visual analog scale was 4.2 for the local anesthesia and 3.0 for the biopsy. Thirty-one patients (67.4%) were diagnosed with prostate cancer, with 18 having a Gleason score ≥ 7. Compared to baseline, no adverse changes in IPSS, Rectal Function Assessment Score, International Index of Erectile Function, Center for Epidemiologic Studies Depression Scale, or postvoid residual were detected at day 30. No patient required catheterization, developed sepsis, or required hospitalization.

CONCLUSION Office-based transperineal prostate biopsy was well tolerated with reasonable treatment-related discomfort, a high rate of prostate cancer diagnosis, and the absence of significant morbidity including sepsis. UROLOGY 94: 24–28, 2016. © 2016 Elsevier Inc.

A renewed interest in transperineal prostate biopsy has emerged secondary to a marked increase in infectious complications following transrectal ultrasound-guided needle biopsy (TRUS) of the prostate gland.[1-4] The increased incidence of infections and urosepsis following TRUS is linked to the emergence of quinolone-resistant flora with an incidence of sepsis as high as 5%.[5] In addition, TRUS results in false negative outcomes in approximately 30% of cases and frequently underestimates Gleason score at the time of radical prostatectomy.[6,7] Sextant biopsies have been replaced by more extensive biopsy schemes that have led to improved cancer detection but potentially greater biopsy-related morbidity including erectile dysfunction.[8-11]

Recently, transperineal prostate biopsy approaches have been increasingly utilized. The advantages of a transperineal approach include the avoidance of the rectal mucosa, minimizing inoculation of the prostate with bowel flora. Following transperineal biopsy, the reported incidence of sepsis is virtually zero and nonlife-threatening urinary tract infections (UTIs) are uncommon.[5,12,13] In a review of 6609 patients, only 5 (0.076%) were admitted to the hospital for sepsis following transperineal biopsy.[13] In addition, transperineal prostate biopsy provides excellent sampling of the anterior and apical regions of the prostate gland, which are frequently undersampled following TRUS and as such may potentially increase prostate cancer detection rates with a reduced risk of underestimating disease volume and grade.[14,15]

In this study, we report the incidence of prostate cancer diagnosis and Gleason score distribution along with quality of life outcomes for the first 46 patients with an elevated

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prostate-specific antigen (PSA), a normal digital rectal examination, and no prior prostate biopsy undergoing office-based transperineal prostate biopsy at our institution.

METHODS

From February 2014 to May 2015, 46 consecutive men underwent office-based transperineal prostate biopsy for an elevated PSA and a normal digital rectal examination without prior prostate biopsy. Prior to biopsy, a repeat PSA was obtained to ensure persistent elevation. All transperineal biopsies were performed by a single operator (GSM). The day prior to the procedure, silodosin (8 mg daily) was initiated and continued for 1 week.[16] All patients received perioperative antibiotics (ciprofloxacin and in selected cases, gentamicin).

With the patient in the dorsal lithotomy position, the perineum was shaved and prepped with povidone-iodine solution. The perineum and prostate were anesthetized transperineally using a 1% lidocaine solution with epinephrine (1:100,000). Approximately 10 cc was used to anesthetize the perineal skin and subcutaneous tissue using a 25-gauge needle. Using a 20-gauge, 10-cm needle, the deeper tissues including the prostate gland were anesthetized with approximately 25 cc of the 1% lidocaine solution. The periapical and prostate injections were performed using transrectal ultrasound guidance. Subsequently, an ellipsoid volume determination of the prostate gland and transition zone were obtained using the 5.0-7.5 MHz transducer (Sonoline; Siemens, Inc, Issaquah, WA). The ellipsoid volumes were calculated as follows: length × width × height × 0.5236.

Transperineal biopsies were obtained using an 18-gauge, 25-cm MAX-core biopsy needle (Bard Peripheral Vascular Inc., Tempe, AZ). A total of 18-20 biopsy cores were obtained from the right base, right mid-gland, right apex, left base, left mid-gland, and left apex. Biopsies were directed to the posterior, lateral, and anterior regions with a customized needle guide and stabilizer. All pathology was performed by a pathologist with significant expertise in prostate pathology (EA). To evaluate tolerability, all patients were asked to respond to a visual analog scale (VAS) ranging from 0 to 10, with 0 representing no pain and 10 representing the worst pain possible. Patients were asked this question immediately following anesthesia and again following completion of the biopsy.

At consultation, all patients completed the following quality of life instruments: the International Prostate Symptoms Score (IPSS), the Rectal Function Assessment Score (R-FAS), the International Index of Erectile Function-6 (IIEF-6), and the Center for Epidemiologic Studies Depression Scale (CES-D). A postvoid residual (PVR) was also obtained prior to biopsy. Each of the quality of life instruments and the PVR were repeated 30 days following biopsy. In addition, an IPSS was also obtained 7 days following biopsy.

Differences in quality of life measures were stratified by prostate cancer diagnosis and compared using a paired Student *t* test or chi-square analysis depending on continuous or categorical variable type, respectively. Differences among baseline day 7 and day 30 IPSS were compared using a one-way analysis of variance. A paired sample *t* test was used to compare groups among IIEF and CES-D baseline and day 30 continuous variables. All data were analyzed using STATA version 13.0 software (StataCorp, College Station, TX) or Statistical Package for the Social Sciences, version 18.0 (SPSS, Inc. Chicago, IL). Statistical significance was set at $P \leq .05$.

RESULTS

Table 1 summarizes the clinical parameters of the study population stratified by the presence or absence of prostate cancer. No statistical differences were noted in age, PSA, body mass index, or concomitant medical illnesses. Following local anesthesia, the mean and median VAS was 4.2 ± 1.8 and 4.0 (range 1-8), whereas the mean and median VAS following biopsy was 3.0 ± 1.4 and 3 (range 1-7). Table 2 summarizes the transperineal biopsy parameters and quality of life outcomes. Of the 46 patients, 31 (67.4%) were diagnosed with prostate cancer. Patients diagnosed with prostate cancer had statistically smaller prostate volumes (34.4 cm^3 vs 57.2 cm^3, $P = .002$) and smaller ellipsoid transition zone volumes (10.7 cm^3 vs 23.5 cm^3, $P = .009$). In terms of quality of life outcomes, no substantial differences were noted in IPSS, R-FAS, CES-D, and PVR at baseline and day 30 (Table 2). Table 3 stratifies IIEF before and after biopsy by prebiopsy function. When stratified by IIEF scores 24-30, 18-23, 13-17, and ≤12, no substantial differences were noted in the baseline and day 30 evaluations. No patient required catheterization, hospitalization, developed sepsis, or required additional therapeutic intervention.

Table 4 summarizes the Gleason score distribution, the number of positive biopsies per patient, and perineural invasion results for the 31 patients with prostate cancer. Eighteen of the 31 prostate cancer patients (58.1%) were diagnosed with a Gleason score ≥ 7. Most men (23/31, 83.4%) were diagnosed with 5 or fewer positive biopsy cores. Of the 13 Gleason score 6 patients, 6 (19.4% of all diagnosed patients) had clinically insignificant prostate cancer based on Epstein criteria (PSA ≤ 10, Gleason score ≤ 6, <3 positive biopsies, and no more than 50% involvement on any core). Of the 13 Gleason score 6 patients, 10 initially opted for active surveillance following a confirmatory transperineal biopsy. At confirmatory biopsy, 3 were diagnosed with Gleason score ≥ 7. Of the 3 patients who opted for initial treatment, 2 underwent radical prostatectomy and 1 brachytherapy.

COMMENT

Transperineal template-guided mapping biopsy (TTMB) has been increasingly utilized in patients with negative TRUS biopsies and for staging of patients prior to enrollment on

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