

Simultaneous Transurethral Resection of Prostate and Prostate Needle Biopsy in Patients with Acute Urinary Retention and Elevated Prostate Specific Antigen Levels

Yen-Ta Chen, MD; Po-Hui Chiang, MD, PhD; Chun-Chien Hsu, MD

Background: To evaluate the safety and accuracy of simultaneous transrectal ultrasonography (TRUS)-guided prostate biopsy and transurethral resection of prostate (TURP), patients with acute urinary retention (AUR) who underwent simultaneous prostate biopsy and TURP were compared with those treated by TURP alone.

Methods: From July 2000 to Jun 2004, 21 patients older than 70 years with AUR were included in each group. Patients with elevated prostate specific antigen (PSA) levels (> 4 ng/ml) underwent TURP and TRUS-guided biopsy simultaneously (group I), while those with normal PSA levels (< 4 ng/ml) received TURP alone (group II). The average ages of group I and group II patients were 72.4 and 72.5 years.

Results: In group I, 4 patients (19%) were diagnosed with prostate cancer; 2 had metastasis and received hormone therapy; and 1 had localized cancer and was treated with brachytherapy. An 82-year-old patient with localized cancer opted for watchful waiting. Compared to group II, patients in group I did not show aggregated morbidity, such as prolonged hospital stay, hematuria, or fever.

Conclusion: Simultaneous TURP and TRUS-guided biopsy in healthy AUR patients does not increase the risk of morbidity. Furthermore, with this approach patients can recover from the stress of AUR and have a definite diagnosis of their condition.

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Key words: acute urinary retention, transurethral resection of prostate, prostate biopsy, prostate specific antigen

Acute urinary retention (AUR) is a condition characterized by a sudden inability to urinate accompanied by severe dysuria which requires catheterization. Patients experiencing AUR are burdened with uncertain diagnoses and multiple voiding

trials. Transurethral prostatectomy (TURP) is still popular in clinical practice to resolve this distressing condition.⁽¹⁾ AUR is an important complication of benign prostatic hyperplasia (BPH) and an indication for surgery in 25–30% of the one million patients

From the Department of Urology, Chang Gung Memorial Hospital-Kaohsiung Medical Center, Chang Gung University College of Medicine, Kaohsiung, Taiwan.

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Correspondence to: Dr. Chun-Chien Hsu, Department of Urology, Chang Gung Memorial Hospital, 123, Dapi Rd., Niasong Township, Kaohsiung County 833, Taiwan (R.O.C.) Tel.: 886-7317123 ext. 8094; Fax: 886-7354309;

E-mail: yenta1965@yahoo.com.tw

undergoing TURP annually in the United States.⁽¹⁻³⁾ In some cases of AUR, the serum prostate-specific antigen (PSA) level is elevated. It is known that urethral catheterization does not cause a significant alteration in the serum PSA level in men with AUR.⁽⁴⁾ Hence, prostate biopsy is indicated for prostate cancer detection. To evaluate the safety and accuracy of simultaneous prostate biopsy and TURP, we compared patients with AUR who underwent simultaneous prostate biopsy and TURP with those treated by TURP alone.

METHODS

We retrospectively reviewed the urological database in our hospital. From July 2000 to Jun 2004, 42 consecutive AUR patients older than 70 years were included and divided into 2 groups according to their serum PSA levels. The PSA cutoff value was set at 4 ng/ml. In this study, we enrolled patients with AUR who were sent to our hospital and failed a voiding trial at least once after using an indwelling urinary catheter. All patients were relatively healthy, without any history of cardiovascular disease, diabetes, or pulmonary disease. The prostate volume of all patients was calculated by transrectal sonography to ensure that the etiology of AUR was enlargement of the prostate. The patients filled out international prostate symptom score (IPSS) questionnaires. Urinalysis and urine cultures were done, and the PSA levels were determined.

After a thorough evaluation, patients with elevated PSA levels (> 4 ng/ml) were treated with simultaneous transrectal ultrasonography (TRUS)-guided sextant biopsy and TURP to resolve any uncertain diagnosis and AUR (group I). Patients with normal PSA levels (< 4 ng/ml) were treated with TURP alone to resolve their AUR (group II).

Under spinal or epidural anesthesia, patients were placed in the lithotomy position. Group I patients first underwent sextant prostate biopsy of the peripheral zone guided by TRUS (B & K Co.). Subsequently, a 26Fr continuous flow resectoscope (Karl Storz Endoscopy, Culver City, California, U.S.A.) was used to perform a standard TURP. Group II patients underwent standard TURP alone. All specimens and tissue slides were examined by uropathologists. Patients with significant urinary tract infection (UTI) were treated perioperatively

with antibiotics based on their perioperative urinary culture report. Patients without UTI were administered 80 mg gentamicin before the procedure and 960 mg trimethoprim-sulfamethoxazole for 5 days after the procedure as prophylaxis. Clinical and personal data were recorded on all patients. The preoperative and postoperative IPSS, postoperative uroflow rate, duration of hospital stay, postoperative hematuria, postoperative sepsis, and pathological reports were compared between groups. The *t* test and Fisher's exact test were used for statistical analysis.

RESULTS

Patient characteristics

The median ages of group I and group II patients were 72.4 and 72.5 years, respectively. The preoperative IPSS and prostate volume were not statistically different between groups I and II. The mean PSA level was 47.2 ± 131.9 ng/ml in group I and 2.3 ± 1.1 ng/ml in group II. Preoperative positive urine cultures were noted in 4 patients in group I (19%) and in 3 patients in group II (14%) (Table 1).

Analysis of postoperative results and complications

Perioperative univariate analysis showed that groups I and II did not exhibit significant differences in the durations of hospital stay (6.3 vs 6.2 days), hematuria (1.9 vs 1.7 days), and fever (0.38 vs 0.38 days). Blood transfusion and a second operation were not required to treat hematuria in either group. Fever was easily controlled by antibiotic therapy. All patients had a successful voiding trial postoperatively. Moreover, there was no difference between

Table 1. Patient Characteristics

Characteristic	Group I	Group II	<i>p</i> value
Patient no.	21	21	–
Mean age	72.4 ± 2.3	72.5 ± 2.2	0.915
Pre-IPSS	26.8 ± 1.7	26.3 ± 1.6	0.5
PSA (ng/ml)	47.2 ± 131.9	2.3 ± 1.1	0.0618
Prostate volume (ml)	42.4 ± 11.1	40.1 ± 12.3	0.3015
Positive urine culture	19% (4/21)	14% (3/21)	1.000

groups in the median postoperative IPSS or uroflow rate (Table 2).

Treatment of biopsy-proven prostate cancers

Cancer was not detected in group II, but 4 patients (19%) in group I were diagnosed with prostate cancer. Patients with biopsy-proven prostate cancer were subjected to magnetic resonance imaging (MRI) and bone scan study. Two patients with

metastases received hormone therapy, and 1 patient with localized cancer was treated with high-dose-rate brachytherapy. An 82-year-old patient with localized cancer opted for watchful waiting (Table 3).

Characteristics of patients with positive urine cultures

Significant UTI was detected in 4 patients in group I and 3 patients in group II.

They had a prolonged hospital stay, significant hematuria, and fever (Table 4).

Positive urine culture appeared to be a risk factor for postoperative fever in both groups.

Table 2. Postoperative Results and Complications

Postoperative result	Group I	Group II	<i>p</i> value
IPSS	8.0 ± 1.4	8.3 ± 1.3	0.615
Uroflow (ml/sec)	14.2 ± 1.5	14.3 ± 1.4	0.919
Mean hospital stay (d)	6.3 ± 0.6	6.2 ± 0.5	0.827
Mean duration of hematuria (d)	1.9 ± 1.2	1.7 ± 1.3	0.472
Mean duration of fever (d)	1.82 ± 0.06	1.75 ± 0.07	0.512
Positive for cancer	4	0	–

Abbreviation: IPSS: International prostate symptom score

DISCUSSION

AUR is defined as the sudden inability to urinate, and it necessitates catheterization. The reported incidence of AUR in males is 0.4–2.5% every year in different age groups. There are 3 etiologies of AUR. The first cause relates to any event that increases resistance to urinary flow, such as BPH. AUR is an important complication of BPH and an indication for

Table 3. Characteristics of Biopsy-proven Prostate Cancer Patients

Age	PSA (ng/ml)	Pathology	Stage	Volume (ml)	Cancer treatment
82	24	Adenocarcinoma, G3 +G2	I	28	Watchful waiting
70	122	Adenocarcinoma, G4 +G4	IV	36	Hormone therapy
73	613	Adenocarcinoma, G5 +G4	IV	37	Hormone therapy
72	9.5	Adenocarcinoma, G2 +G2	I	27	Brachytherapy

Table 4. Characteristics of Patients with Positive Urine Cultures

Pathogen	PSA	Fever (d)	Hematuria (d)	Volume	Hospital stay (d)
<i>E. coli</i>	22	1	4	37	7
<i>E. coli</i>	122	2	3	36	8
<i>Proteus</i>	10.6	1	5	42	7
<i>Kleb p</i>	11	3	4	36	8
<i>E. coli</i>	1.5	2	3	62	8
<i>E. coli</i>	2.4	2	3	28	8
<i>Kleb. p</i>	2.2	3	2	43	8

Abbreviations: PSA: prostate specific antigen; *E. coli*: Escherichia coli; *Kleb. p.*: Klebsiella pneumoniae.

surgery in 25–30% of patients undergoing prostatectomy.⁽²⁾ Second, AUR may result from either abnormalities of sensory innervation of the bladder wall or weakness of the detrusor muscle.⁽³⁾ The third category relates to any condition that permits the bladder to overdistend (e.g., surgery or drugs).⁽³⁾

The overall incidence of AUR in a cohort of 2214 patients older than 70 years who were newly diagnosed with lower urinary tract symptoms (LUTS)/BPH was 35.9 per 1000 man-years. Approximately 50% patients with AUR caused by LUTS/BPH present with AUR as the first symptom. Patients experiencing AUR are burdened with uncertain diagnoses and multiple voiding trials.⁽⁴⁾ To resolve this distressing condition, TURP is still the most effective and popular strategy used in clinical practice.⁽⁵⁾ Prostate tissue for pathological identification can be obtained by TURP. However, 60%–70% of prostate cancers arise in the peripheral zone. In these cases, TURP may not be able to provide solid evidence for cancer diagnosis. Hence, a prostate needle biopsy remains mandatory.⁽⁶⁾ In cases of AUR with elevated serum PSA levels, prostate needle biopsy is indicated to detect prostate cancer. In these cases, a simultaneous prostate biopsy with TURP appears to be effective in resolving AUR and achieving a definitive diagnosis.

To our knowledge, no related study has focused on the safety and accuracy of simultaneous prostate biopsy and TURP. In our study, patients experiencing AUR with elevated PSA levels who underwent simultaneous prostate biopsy and TURP did not exhibit a higher risk of perioperative morbidity and mortality than patients who underwent TURP alone. In Taiwan, patients older than 74 years are not considered suitable candidates for radical prostatectomy after prostate cancer is detected. In our study, 4 patients were diagnosed with prostate cancer and all of them received suitable treatment according to their condition after recovery from AUR.

Sepsis is the most dangerous complication of prostate biopsy and is potentially life threatening.⁽⁷⁻⁹⁾ The use of prophylactic antibiotics is widely accepted, but no standard dosage or duration has been established. Although a Swedish group reported only a 2.9% rate of fever in a 400-patient series of sextant prostate biopsy without prophylactic antibiotics, most studies found significantly lower infection rates in patients who received a 1-week course of anti-

otics than in those who received antibiotics only on the day of biopsy.⁽¹⁰⁻¹²⁾ Thus, antibiotic prophylaxis may help decrease the risk of post biopsy infection. In this study, we observed that under prophylactic antibiotic treatment, simultaneous prostate biopsy and TURP does not increase the rate of complications. In addition, we observed that a positive urine culture was a risk factor for postoperative fever. Patients with preoperative positive urine cultures had fever and required a prolonged hospital stay. Bacterial colonization in a urinary catheter is significantly greater 3 days after catheterization and can result in morbid events.⁽⁴⁻¹³⁾ However, there was no fever in patients with negative urine cultures. Thus, surgical intervention without the presence of a urinary catheter may be beneficial in the prevention of perioperative sepsis.⁽⁵⁾

Postbiopsy hematuria is a common complication of prostate biopsy.⁽⁶⁻⁸⁾ In this study, hematuria was minor and there was no statistically significant difference in the duration of hematuria between groups. Meticulous hemostasis during a transurethral procedure may prevent postbiopsy hematuria.

Conclusions

We conclude that simultaneous TURP and TRUS-guided biopsy in healthy AUR patients does not increase the risk of bleeding or sepsis. Following this procedure, patients can recover from the stress of AUR and have a definite diagnosis of their condition.

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在急性尿瀦留合併前列腺特異抗原升高的病人 同時施行前列腺切片與前列腺括除術之經驗

陳彥達 江博暉 徐淳建

背景：為評估在急性尿瀦留合併前列腺特異抗原升高的病人同時採行前列腺切片與經尿道前列腺括除術的安全性及可行性。

方法：自2000年7月至2004年6月間，依病人前列腺抗原大於4 ng/ml 與否而分成兩組，各收集了21例年齡超過70歲急性尿瀦留的病人。前列腺抗原大於4 ng/ml 的一組則合併施與經直腸超音波導引前列腺切片及經尿道前列腺括除手術(第一組)。在前列腺抗原小於4 ng/ml 的一組僅施行經尿道前列腺括除術(第二組)。

結果：在前列腺抗原大於4 ng/ml 的一組發現4例前列腺癌病人約佔19.4%。其中2例有轉移病灶接受賀爾蒙治療，1例局限性疾病接受放射線進階治療，1例82歲局限性疾病病患選擇觀察。分析兩組病人在住院天數、血尿及發燒等因素並無明顯差異。

結論：在年齡大於70歲的健康尿瀦留病人同時施與前列腺切片及經尿道前列腺括除術並無增加出血及敗血症的危險。病人由解尿困難及診斷不明的壓力中得到快速且安全的恢復排尿功能。

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關鍵詞：急性尿瀦留，經尿道前列腺括除術，前列腺切片，前列腺特異抗原

長庚紀念醫院 高雄院區 泌尿科；長庚大學 醫學院

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通訊作者：徐淳建醫師，長庚紀念醫院 泌尿科。高雄縣833鳥松鄉大碑路123號。Tel.: (07)7317123轉8094;

Fax: (07)7354309; E-mail: yenta1965@yahoo.com.tw