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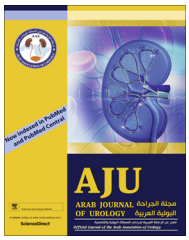

PROSTATIC DISORDERS
ORIGINAL ARTICLE

Evaluation of the risk factors associated with the development of post-transurethral resection of the prostate persistent bacteriuria

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KEYWORDS

TURP;
UTI;
Bacteriuria;
Urine analysis

ABBREVIATION

DM, diabetes mellitus

Abstract ***Objectives:*** To determine the preoperative, intraoperative and postoperative risk factors that influence the development of persistent post-transurethral resection of the prostate (TURP) urinary tract infection (UTI) defined as pyuria and/or bacteriuria remaining for 3 weeks after surgery.

Patients and methods: This is a prospective study including 100 patients scheduled for TURP. Urine analysis and culture was performed immediately after catheter removal, then at 1 and 3 weeks postoperatively, and the results were correlated to various preoperative, intraoperative and postoperative potential risk factors to detect any significant relation to persistent UTI.

Results: There was a statistically significant relationship between bacteriuria and the following risk factors: old age, past history of diabetes mellitus, large prostatic size, positive preoperative urine analysis and culture, preoperative catheter use, previous urological interventions, large size of sheath, long duration of operation, postoperative catheter events and postoperative manual wash.

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Conclusions: Many risk factors have been found to contribute to the development of post-TURP UTI and avoiding these factors can enhance recovery of patients undergoing TURP.

Introduction

There is much controversy regarding urological endoscopic surgeries and the proposed risk of UTI [1]. TURP has monopolised surgical intervention of BPH-induced LUTS for a long time [2]. However, TURP still carries high morbidity [3], and UTI is the most common complication secondary to this procedure [4]. Post-TURP UTI affects postoperative voiding patterns, and can be followed-up reliably by postoperative urine analysis and culture [4]. The aim of the present study was to evaluate and assess different possible preoperative, intraoperative and postoperative risk factors influencing the development of UTI (pyuria and bacteriuria) after TURP, particularly that which persists for up to 3 weeks after the procedure.

Patients and methods

This was a prospective clinical study carried out during the period between March 2014 and September 2016. In all, 100 consecutive men scheduled for TURP were included in this study. Verbal and written consents explaining the purpose of the study were obtained from all patients. Concomitant bladder pathology, including stones, was considered an exclusion criterion. Standard preoperative evaluation was done routinely, including urine culture and antibiotic sensitivity, full laboratory evaluation, abdominopelvic ultrasonography, uroflowmetry, and urodynamic studies, whenever indicated.

Surgical procedure

All patients were given 1 g ceftriaxone at induction of anaesthesia, which was regional in all cases, and all were operated upon in the lithotomy position. All surgeons had $\geq$15 years of experience and had performed $\geq$300 TURP procedures. TURP was done with either 24- or 26-F resectoscope according to surgeon's preference and with standard monopolar loops. The cutting power ranged from 90 to 150 W and the coagulation power ranged from 60 to 90 W. Glycine was the standard irrigation fluid in all operations. All procedures were performed using the modified Nesbit technique, whereby the median lobe was resected first, then resection of each lateral lobe starting from the 12 o'clock position to the 6 o'clock position was carried out one lobe at a time, with care taken to avoid subtrigonal resection or injury of the external sphincter. Finally, the apical lobes were resected followed by adequate haemostasis. A three-way urethral Foley catheter was then inserted with a continuous irrigation system. Postoperative management included a 3 day course of i.v. third-generation cephalosporin, unless the preoperative urine antibiotic sensitivity stated otherwise. The catheter was removed after 3 days. Catheter events were handled first by manual wash to relieve clot retention, up to catheter exchange if required.

Study design

Urine analysis and culture were obtained for all patients on three occasions: immediately after catheter removal, then at 1 week after TURP, and finally at 3 weeks after TURP. Pyuria was defined as the presence of >5 pus cells/high-power field in a urine sample, whilst bacteriuria was defined as the presence of $>100{,}000$ colony-forming units/mL in a urine sample.

All possible preoperative, intraoperative and postoperative risk factors were studied in relation to post-TURP UTI (bacteriuria and pyuria; Table 1).

Table 1 Possible preoperative, intraoperative and postoperative risk factors that may lead to persistent post-TURP UTI.

Preoperative	Intraoperative	Postoperative
Age	Surgeon's experience (years and number of TURP operations)	Catheter (size and type)
Presentation	Sterilisation (duration of activation of CIDEX®, sterilisation of instruments and telescope)	Blood transfusion
Prostate size	Irrigation fluid volume	Catheter events (block, clot retention and exchange)
PSA level	Resectoscope size	Continuous irrigation (type of fluid, duration)
Urine analysis/culture	Power current setting (cutting and coagulation)	Need for manual irrigation to drain clots
Renal function tests	Duration of operation	Urine analysis/culture 3 weeks after TURP
Catheter if present (type, size and duration)		
Previous urological interventions		
Past history of medical problems		