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Indications and Complications of Benign Prostatic Hyperplasia (BPH) Patients Who Underwent Transurethral Resection of Prostate (TURP): A Retrospective Study at Teluk Kuantan Regional Hospital (2022-2024)

Abrar Risandi[1], Ramlan Halimi[1]

[1]Department of Urology, Teluk Kuantan Regional General Hospital, Riau, Indonesia

Corresponding Author: Abrar Risandi

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ABSTRACT

Background: Benign Prostatic Hyperplasia (BPH) is a benign enlargement of the prostate gland as seen from a histopathological perspective, with incidence increasing with age. Transurethral Resection of the Prostate (TURP) is the most commonly used minimally invasive procedure for the treatment of BPH. The TURP procedure is performed according to clinical indications and may cause complications, both in the short and long term.

Method: This study used a retrospective descriptive design with a sample of 106 BPH patients who underwent TURP procedures at Teluk Kuantan Regional General Hospital.

Result: The characteristics of the study subjects showed an average age of 67.1±8 years. The distribution of major comorbidities included hypertension (32.0%), diabetes mellitus (9.4%), and heart disease (0.9%). Laboratory examination results showed anemia (hemoglobin <12 g/dL) in 21.6% of cases (n=23) and elevated serum creatinine (>1.5 mg/dL) in 2.8% of subjects (n=3). Perioperative parameters included: average prostate volume of 55.1±23.8 grams, postoperative hospital stay of 2.1±0.6 days, and intraoperative blood loss of 61.7±26.1 mL. Acute urinary retention was the primary indication for TURP (72.6%; n=77), while urethral stricture was the dominant complication (5.6%; n=6).

Conclusion: Based on the results of the study, it can be concluded that the main indication for TURP in this study was acute urinary retention (72.6%; n=77), while the most common complication found was a long-term complication in the form of urethral stricture (5.6%; n=6).

Keywords: Transurethral Resection of the Prostate, Benign Prostatic Hyperplasia, Indications and Complications

INTRODUCTION

Benign prostatic hyperplasia (BPH) is a pathological process in the form of benign tumors that most often occurs in men.[1] This condition is common in elderly men, with the incidence increasing with age.[2] Epidemiological data shows that more than 70% of men aged 60-69 years suffer from BPH, and the prevalence reaches more than 90% in men aged 70 years and over.[3] According to the American Urological Association (AUA), BPH results from continued growth of the prostatic transition

zone, which initially accounts for only 5% of the prostate volume, but continues to expand with age.[4] BPH causes obstructive and irritative symptoms, including: straining (straining during micturition), nocturia (frequent nighttime micturition), increased micturition frequency, urgency (urgent micturition), hesitancy (difficulty initiating micturition), dysuria, weak stream, and incomplete emptying.[5]

The selection of the optimal treatment modality for benign prostatic hyperplasia (BPH) depends on several factors, including: severity of symptoms, prostate size, and general condition of the patient. Treatment options range from medical management to surgical procedures such as transurethral resection of the prostate (TURP), open prostatectomy (OP), or minimally invasive surgical techniques.[6] In BPH patients with prostate size <70-80 grams, TURP is the standard treatment modality.[6] Indications for TURP include: lower urinary tract symptoms (LUTS) refractory to medical therapy, acute urinary retention, and BPH complications such as: recurrent urinary tract infections, recurrent hematuria, vesical urinary diverticula, bladder stones, and renal insufficiency.[7]

TURP can cause various complications both in the early and long-term periods. [8] This study aims to evaluate the prevalence of indications and complications of TURP in BPH patients.

MATERIALS & METHODS

This study used a retrospective descriptive design with secondary data in the form of medical records of patients who underwent transurethral resection of the prostate (TURP) at Teluk Kuantan Hospital in the period January 2022-December 2024. Data collection was carried out at the hospital Medical Records Installation. The inclusion criteria of the study included patients who underwent TURP with monopolar technique, medical records containing complete data regarding: preoperative conditions, indications for action, clinical management, post-TURP complications. Exclusion criteria included patients with a confirmed diagnosis of prostate cancer through histopathological examination.

Study variables included preoperative data collected included: patient age, comorbid diseases (diabetes mellitus, hypertension, heart disease), laboratory parameters (serum hemoglobin and creatinine levels). indications for TURP were classified as: acute urinary retention (defined as patients requiring urinary catheterization including failed Trial Without Catheter/TWOC cases), severe lower urinary tract symptoms (LUTS) refractory to medical therapy, and chronic complications of BPH. Clinical management assessed consisted of: prostate volume based on ultrasonography (USG) examination, length of stay, and intraoperative bleeding volume. postoperative complications evaluated included: hematuria, blood clot retention, urethral stricture, and TURP syndrome. Sampling technique the study used a total sampling method of all patients who met the inclusion criteria during the study period

RESULT

During the study period of January 2022-December 2024 in the Medical Record Installation of Teluk Kuantan Hospital, 122 benign prostatic hyperplasia (BPH) patients who underwent transurethral resection of the prostate (TURP) procedures were identified. After selection based on inclusion and exclusion criteria: 4 patients were excluded from the study due to a diagnosis of prostate cancer confirmed by histopathologic examination and the remaining 12 patients did not meet the criteria due to incomplete medical record data. Thus, the total study subjects who met the criteria were 106 BPH patients who underwent TURP.

Data analysis in this study showed the characteristics of the study subjects including the mean age of BPH patients who underwent TURP was 67.1 ± 8 years (mean: ±SD). Comorbid diseases included

diabetes mellitus in 10 patients (9.4%), hypertension in 34 patients (32%), and heart disease in patients in 1 patient (0.9%). Laboratory parameters included hemoglobin levels <12 mg/dL in 23 patients (21.6%) and creatinine levels >1.5 mg/dL in 3 patients (2.8%).

Table 1. Results of preoperative investigations	
	n (106)
Age (yr)*	67,1± 8
DM	10 (9,4%)
H/T	34 (32%)
CVD	1 (0,9%)
Hb < 12 mg/dL	23 (21,6%)
Cr> 1.5 mg/dL	3 (2,8%)

Mean ± standard deviation; DM= diabetes mellitus; H/T= Hypertension; Hb= hemoglobin; Cr= Creatinine

Analysis of data showed the distribution of indications for TURP including acute urinary retention in 77 cases (72.6%) and recurrent urinary tract infection in 1 case (0.9%). This study identified acute urinary retention as the main indication for TURP in the study population, while recurrent urinary tract infection was the least common indication.

Table 2. Indications for transurethral resection of the prostate		
Surgical Indication	n	%
Acute urinary retention	77	72,6
Failure of medication	11	10,4
Chronic complications		
Bladder stone/diverticulum	12	11,3
Recurrent hematuria	2	1,9
Recurrent UTI	1	0,9
Renal function impairment	3	2,9
Total	106	100

UTI= Urinary tract infection

Data analysis of this study showed that the clinical parameters of TURP action included a mean prostate volume of 55.1±23.8 grams, mean postoperative treatment duration of 2.1±0.6 days, and mean intraoperative bleeding volume of 61.7 ± 26.1 mL.

Table 3. Clinil Management	
	n (106)
Prostate size (g)*	55,1± 23,8
Hospital stay day (d)*	2,1±0,6
Surgical bleeding	61,7±26,1

Mean ± standard deviation

Data analysis showed that 10 out of 106 patients (9.4%) experienced post-TURP complications with the distribution dominated by urethral stricture (5.7%), followed by urinary retention due to blood clots (0.9%).

Table 4. Perioperative and long term operative complications of surgery.		
	N	**%**
Hematuria	3	2,8
Blood clot retention	1	0,9
Stricture urethral	6	5,6
TURP syndrome	0	0
Total	10	9,3

DISCUSSION

The main objectives of surgical intervention in patients with benign prostatic hyperplasia (BPH) are to reduce clinical symptoms, minimize complications, improve quality of life, improve urine flow, and reduce the need for repeat surgery.[9] Transurethral resection of the prostate (TURP) is currently still the gold standard therapeutic modality in the management of BPH.[10]

The findings of this study showed the characteristics of BPH patients who underwent TURP with a mean age of 67.1 ± 8 years. These results are consistent with the literature which states that the prevalence of BPH increases proportionally with age.[11] Research by Prasetyo et al. (2021) reported a similar pattern, with the highest age distribution in the 61-70 years group (mean 68.1 years).[11] Analysis of comorbidities in 106 study subjects showed diabetes mellitus in 10 patients (9.4%), hypertension in 34 patients (32%), and cardiovascular disease in 1 patient (0.9%). Recent scientific evidence indicates that these comorbidities may affect post-TURP outcomes, both in the short and long term.[12] The study by Yuta

et al. (2023) reinforced this study by showing a significant association between comorbidities (diabetes, hypertension, and cardiovascular disease) and an increased risk of postoperative complications.[12]

Based on the literature, indications for TURP in BPH patients include: acute urinary retention, failed therapy without catheter (TWOC), recurrent urinary tract infection, recurrent hematuria, urinary tract stones, impaired renal function, and pathological changes in the upper and lower urinary tract.[7,13] The results of our study showed that the most common indication was acute urinary retention (72.6%; n=77), which is an absolute indication for surgical intervention.[8] This finding is in line with Cahayani et al. who reported urinary retention as the main indication for TURP (53.2%; n=90/169).[14]

According to the 2021 IAIU guidelines, TURP is the gold standard for BPH with a prostate volume of 30-80 mL.[8,14] In this study, the mean prostate volume was 55.1±23.8 mL, consistent with the findings of Sokhal et al. the mean prostate volume was 42.8±6.4 mL.[15] The mean duration of hospitalization was 2.1±0.6 days (range: 2-8 days), with extended care especially in cases of persistent bleeding. This data is in accordance with the report of Bhatta et al. with a mean duration of 2-4 days.[16]

The optimal duration of TURP resection is 30-60 minutes, with a maximum limit of 70 minutes to minimize the risk of complications such as TURP syndrome.[17,18] The development of modern surgical techniques and equipment has significantly reduced the rate of complications.[10] The complications we found included early complications, namely hematuria 2.8% (n = 3) blood clot retention 0.9% (n = 1) and late complications, namely urethral stricture 5.6% (n = 6).

Preoperative complications in this study were found in the form of hematuria in 3 patients (2.8%) and blood clot retention: 1 patient (0.9%). This study is in line with the study of Halimi et al. who reported an incidence of hematuria of 2.5% and blood clot retention of 2.5%.[13] The pathophysiology of post-TURP hematuria can be explained through several mechanisms of bleeding from hypertrophied prostate tissue, both from arterial and venous vessels, increased angiogenesis due to preoperative infection or chronic urinary retention and perforation of the prostate capsule causing venous bleeding from open sinusoids.[19]Advanced complications in this study were found in the form of urethral strictures in 6 patients (5.6%), a lower number than the report of Geremew et al. which occurred in 9 patients (5.2%).[20] Mechanisms for post-TURP urethral stricture include thermal trauma from electric current that induces urethral fibrosis. Anatomical factors consist of external urethral meatus stricture (due to mismatch of instrument diameter) and bulbar stricture (due to inadequate lubricant isolation causing monopolar current leakage).[18,19]

CONCLUSION

The number of BPH patients who underwent TURP at Teluk Kuantan Hospital in the period 2022-2024 was 106 patients with the highest incidence of indications in acute urinary retention in 77 patients (72.6%) and the highest incidence of complications in late complications, namely urethral stricture in 6 patients (5.6%).

Declaration by Authors

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