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Bipolar Transurethral Resection of the Prostate: Short-Term Outcome Evaluation in Regional Hospital in Senegal

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Abstract

Introduction: Transurethral resection of the prostate is still the most popular procedure that use for the surgical treatment of lower urinary tract symptoms due to benign prostatic obstruction in developed countries. Bipolar transurethral resection of the prostate (B-TURP) is a recent technique in our urological practice. The aim of this study was to evaluate our preliminary results on the use of a B-TURP in Kolda (Senegal) in a benign prostatic hyperplasia (BPH). **Materials and Methods:** This was a 15-month, retrospective and descriptive study from June 2021 to August 31, 2022. It examined the records of patients who had BPH requiring surgical treatment and who received Bipolar transurethral resection of the prostate (B-TURP) during the study period at the Kolda Regional Hospital in Senegal. We used a Karl STORZ bipolar endoscopy column with a 26 sheath and 30˚ optics. The parameters studied were the civil status of the patients, the clinical and para-clinical data as well as the operative indications. The data were entered and analyzed using Epi-info 3.5.1.1. **Results:** A total of 31 patients underwent bipolar transurethral resection of the prostate during the study period. The mean age of patients was 68.5 ± 12.6 years (range, 56 - 77 years). The mean total PSA was 4 ± 2.3 ng/ml (range, 0.5 - 11 ng/ml). The mean prostate size assessed by ultrasound was 54 ± 12.3 ml (range, 30 - 90 ml). The operative indication was dominated by BPH with impact on the upper urinary tract. The mean of bladder irrigation time was 21.4 ± 3.9 hours (range, 12 - 26 hours). In the immediate postoperative period, blood transfusions were performed in 2 patients (6.5%). In the medium-term follow-up, we noted one 1 (3.2%) case of urine retention requiring bladder catheterization. **Conclusion:** Bipolar Transurethral resec-

tion of the prostate B-TURP in saline system is efficacious and safe. The results of this preliminary study of B-TURP are satisfactory with a low complication rate. B-TURP decreases the duration of the hospitalization and the port of the probe. Our perspectives are oriented towards endoscopy of the upper urinary tract.

Keywords

Benign Prostatic Hyperplasia (BPH), Bipolar, Transurethral Resection of Prostate, Complications

1. Introduction

Benign Prostatic Hyperplasia (BPH) is one of the most common conditions that affect aging males. Its prevalence increases with age, affecting approximately 50% of men over 60 and 80% of those over 80 [1]. The lower urinary tract symptoms (LUTS) such as frequent urination, urgency, and dysuria, caused by BPH-related Benign Prostatic Obstruction (BPO) continue to be a major problem in the aging males. The incidence of LUTS and BPO is high and increases linearly with age [2]. Monopolar transurethral resection of the prostate (M-TURP) remains the gold standard surgical treatment for BPH. However, the procedure is associated with significant morbidities, including acute dilutional hyponatremia, due to the passage of irrigation fluid into the systemic circulation, transurethral resection (TUR) syndrome, bleeding and urethral strictures [2] [3]. Moreover, M-TURP has some drawbacks such as its limitation of use in patients with older generation Pacemakers [4]. New techniques have been developed with the aim of reducing the risk of complications related to M-TURP [5]. Bipolar transurethral resection of the prostate (B-TURP) has the advantage of allowing the use of saline irrigation during the resection, and thereby reduces the risk of TUR syndrome, allowing for longer and safer resection, B-TURP has been introduced since years, indisputably representing the most thoroughly investigated M-TURP alternative [6]. The B-TURP has also improved hemostasis, resulting in the better intraoperative visualization, shorter catheterization time and reduced hospitalization. The objective of this study was to evaluate our preliminary results of the use of B-TURP in Kolda (Senegal).

2. Materials and Method

This was a 15-month, retrospective and descriptive study from June 2021 to August 31, 2022. The study was exhaustive and involved all patients who had a B-TURP. The data was obtained using patient records, the hospitalization register and the operative report register. We included in this study the records of patients who had bipolar TURP indicated for BPH with normal PSA levels. Patients who had elevated PSA levels with a negative prostate biopsy were also included. We excluded from the study, the patients who underwent prostate resec-

tion for malignant prostate tumor and BPH with open surgery. It examined the records of patients who had BPH requiring surgical treatment and who received Bipolar transurethral resection of the prostate (B-TURP) during the study period at the Kolda Regional Hospital in Senegal. We used a Karl STORZ bipolar endoscopy column with a 26 sheath and 30˚ optics (Figure 1). TURP was performed under 0.9% isotonic saline irrigation and at the end of the procedure, a three-way CH22 transurethral bladder catheter was immediately placed and bladder irrigation with isotonic saline continued in the hospital ward until the irrigation fluid is clear. The bladder catheter was removed on the 3rd or 4th postoperative day and the patient was discharged the day after the catheter was removed. The parameters studied were the civil status of the patients, the clinical and para-clinical data as well as the operative indications. Patients with pre-operative transurethral bladder catheters with urinary tract infection documented by urinalysis had undergone catheter switching and antibiotic therapy according to susceptibility testing started 3 to 4 days prior to resection and was continued postoperatively. In the postoperative period, we noted the duration of bladder irrigation, transurethral drainage, hospitalization, and detection of possible complications. The patients were followed for at least 3 months with a first check-up at one month and then at 3 months. The data were entered and analyzed using Epi-info 3.5.1.1. The descriptive analysis was performed by calculating simple frequencies and percentages, averages, medians and standard deviations.

3. Results

A total of 31 patients underwent transurethral resection of the prostate during the study period. The mean age of patients was 68.5 ± 12.6 years (range, 56 - 77 years) (Table 1).

More than half of our patients 51.6% (16) had a Urinary Tract Infection (UTI) prior to transurethral resection of the prostate. *E. coli* was the most common germ (Figure 2). Treatment was done according to susceptibility testing. Of note, 4 cases of multi-drug resistant infections were treated with imipenem in

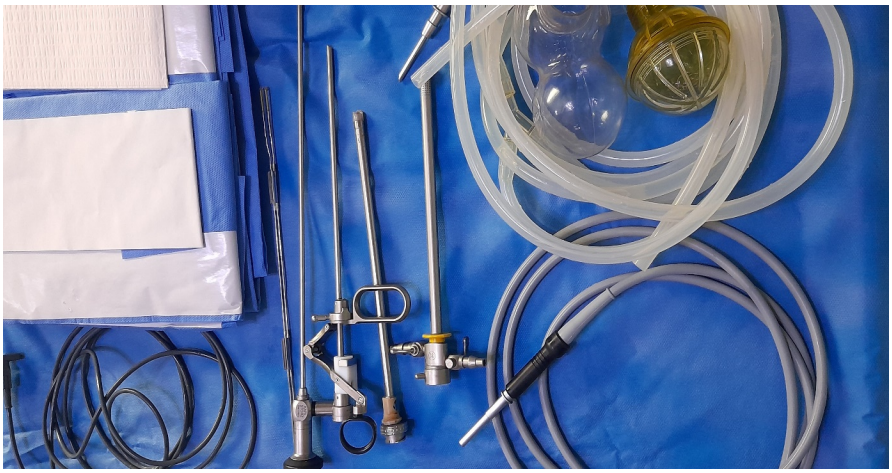

Figure 1. Bipolar resection set.

perioperative period. The mean total PSA was 4 ± 2.3 ng/ml (range, 0.5 - 11 ng/ml). Biopsy was performed in 4 patients for total PSA elevation with negative results. The mean prostate size assessed by ultrasound was 54 ± 12.3 ml (range, 30 - 90 ml). The operative indication was dominated by BPH with impact on the upper urinary tract (Table 2). Transurethral resection of the prostate was conducted with bipolar current in all of our patients. Gestures associated with TURP were one case of endoscopic urethrotomy, one case of right hydrocele cure and one other of the left inguinal hernia cure. The mean bladder irrigation time was 21.4 ± 3.9 hours (range, 12 - 26 hours). In the immediate post-operative period, blood transfusions were performed in 2 patients (6.5%) and two patients (6.5%)

Table 1. Distribution of patients according to age group.

Variable	Value	%
Age (In Years)		
50 - 59	2	6.4
60 - 69	14	45.2
70 - 79	15	48.4

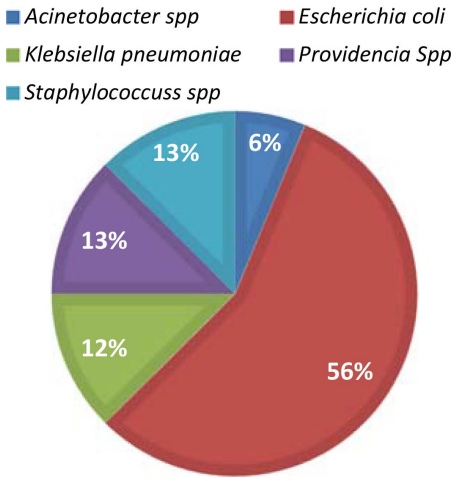

Figure 2. Germs identified on urine analysis.

Table 2. Surgical indication.

Variable	Value	%
Surgical indication		
Failure to bladder catheter removal	2	6.5
Medical treatment failure	8	25.8
Ureterohydronephrosis	9	29
Chronic urinary retention	5	16.1
Renal insufficiency	7	22.6
Total	31	100

had fever without evidence of haemodynamic instability with a favourable outcome with an antibiotic and antipyretic treatment. The mean duration of hospitalization was 4.4 ± 0.76 (range, 3 - 7). In the medium-term follow-up, we noted one 1 (3.2%) case of urine retention requiring bladder catheterization in a patient who had a multidiverticular and trabeculated bladder, four (12.9%) cases of dysuria treated with alpha blocker with spontaneous improvement. In the 4th postoperative month, one case of death was reported unrelated to TURP.

4. Discussion

There are many techniques for treating benign prostatic hyperplasia. Open surgery for Benign Prostatic Hyperplasia (BPH) remains a popular practice in rural African countries, such as Senegal. While TURP for treatment of benign prostatic hyperplasia is common practice [7] [8] in Senegalese university hospital canters. B-TURP is a recent practice in our hospital. Bipolar technology unlike monopolar technology, both poles (active and return) are integrated into electrode design. They are on the same axis, separated by a ceramic insulator. As a result, energy remains confined to the prostate resection site and does not flow through the patient's body [4]. This allows the resection of larger prostates (greater than 80 ml) and a longer resection time [9]. Compared to Monopolar TURP (M-TURP), B-TURP would reduce the risk of TURP syndrome [10], which is related to the excessive absorption of hypotonic fluid used in the M-TURP procedure. TUR syndrome is characterized by mental confusion, nausea, vomiting, hypertension, bradycardia, and visual disturbances. It is caused by dilutional hyponatremia (serum sodium < 125 mEq/l) caused by early perforation of capsular veins or sinuses with consecutive influx of hypotonic irrigating fluid. The TUR syndrome may have severe consequences like cerebral or bronchial edema. However, the incidence of TUR syndrome has decreased significantly during the last few decades from 3% to <1% [11]. None of our patients had has TUR syndrome. In a randomized controlled trial of 100 patients between M-TURP and B-TURP, two cases of TURP syndrome were observed against zero cases of M-TURP and B-TURP, respectively [12]. Thus, The transurethral resection of the prostate (TURP) in saline has the potential to make TURP a safer routine procedure.

Surgical treatment is indicated for patients with bothersome BPH symptoms refractory to medical treatment, and those who had a repeated acute urinary retention with failure to bladder catheter removal, chronic retention of bladder urine, and dilatation of the upper urinary tract with or without renal insufficiency, recurrent urinary tract infections, bladder stones, or diverticula [13]. Some of these elements have been the surgical indications in our patients. Chronic retention of bladder urine, the upper urinary tract dilation and ureterohydronephrosis were present in more than 67% of our patients.

The median preoperative prostate volume resected in a study was 57 ml (39 - 80.75) [14], in this study, the mean resected prostate volume was 54 ± 12.3 cc

and the mean irrigation time was 21.4 ± 3.9 hours. Bladder irrigation is maintained until clear urine is obtained. This time is shortened if good quality haemostasis is done during prostate resection. As a result, the carrying of the bladder catheter is reduced and the length of hospitalization is also reduced. The mean duration of post-operative bladder catheterization was 4 days in the study of Diagana M *et al.* [15], and the mean duration of hospitalization was 4.8 days in another study cited by Abdallah MM [16]. The transurethral catheter is usually removed as soon as the urine was clear. We usually discharge our patients the day after the removal of the bladder catheter after a 24-hour observation.

Transurethral resection of the prostate (TURP) is a common technique in the treatment of benign prostatic hyperplasia (BPH). But bleeding is the common morbidity during and after the procedure. The need for blood transfusions varies between 0.4% and 8.6% in developed countries [17]. The transfusion rate observed in this study was 6.5%, however, the size of our sample does not allow us to formally conclude in this preliminary study phase. Factors such as the weight of resected prostate tissue and the duration of prostate resection longer than 60 minutes were associated with increased blood loss according to some authors [18]. Moreover, in another study [19], authors reported that there was no significant difference between M-TURP and B-TURP regarding the frequency of blood transfusions.

Additionally, in a randomized controlled trial, Mamoulakis, C and al [20], concluded that the midterm results from the first international/multicentre RCT show that the safety and efficacy of B-TURP is similar to M-TURP.

We had noted a case of urine retention on removal of the bladder catheter requiring new bladder catheterization. Determining which patients are most likely to successfully urinate after TURP remains a dilemma. Previous researchers have analysed risk factors and identified that old age, large PVR and low bladder pressure at urodynamic predict worse outcomes [21]. It has been pointed out that [22], the urinary retention after the TURP is mainly attributed to primary detrusor failure rather than to incomplete resection.

However, this study had some limitations:

1) First, it was a retrospective study and the sample size is small, making it difficult to compare our results with other studies.

2) Secondly, we only studied patients who received TURP-B in our center. This means that we could not make comparisons to highlight the benefits of B-TURP compared to M-TURP.

5. Conclusion

Bipolar Transurethral resection of the prostate in saline system is efficacious and safe. Bipolar transurethral resection of the prostate is a recent practice in our center. The results of this preliminary study of B-TURP are satisfactory with a low complication rate for a center at the start of endoscopic experience. B-TURP decreases the duration of the hospitalization and the port of the probe.

Our perspectives are oriented towards endoscopy of the upper urinary tract.

Conflicts of Interest

The authors declare no conflicts of interest regarding the publication of this paper.

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