

Results of an Eight Year Long Practice of Saline Bipolar Transurethral Resection of Prostate

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Abstract

Background: Open prostatectomy has long been the only prostatic bladder outlet obstruction's surgery available in Benin. It is prone to postoperative bleeding and infections and is not suitable for prostate cancer-induced bladder outlet obstruction. **Objective:** To evaluate the first results of endoscopic surgery of prostatic bladder outlet obstruction in our environment. **Patients and Method:** We conducted an observational study of saline bipolar transurethral resection of prostate (B-TURP) at the former Military Teaching Hospital of Cotonou. We retrospectively collected the data from patients' medical records from November 17, 2014, to September 7, 2022. We used Excel 2019 to make a descriptive analysis of the data. **Results:** Saline B-TURP was performed in 60 consecutive patients. Their mean age was 69.1 years (range: 48 - 85). The procedure was indicated in 22 (36.7%), 32 (53.3%), 3 (5%), and 3 (5%) patients, respectively for acute urinary retention, chronic urinary retention, obstructive renal failure, and unresponsiveness to alpha-blockers. 35 patients (58.3%) had prostate cancer (PCa). 25 patients (41.7) had benign prostate hyperplasia (BPH). No patient got a blood transfusion. The duration of postoperative hospitalization was 3 days (88.3%) to 5 days (11.7%). 5 patients (8.3%), *i.e.*, 3 BPH and 2 prostate cancer patients got preoperative urinary tract infection. The causative bacteria were *Escherichia coli* in 3 patients (60%), *Klebsiella pneumoniae* in 2 patients (40%), and multi-resistant Acinetobacter as a metachronous infection to *Escherichia coli* in 1 patient (20%). All the infections were associated with indwelling Foley catheter. 7 patients (11.7%), *i.e.*, 3 BPH and 4 prostate cancer patients, got a second resection to recover full spontaneous micturition. Prostate size was available in the medical record of 21 BPH patients and 15 prostate cancer patients. Prostate size ranged from 22 to 123 g with a mean value of 61.1 g in BPH patients, and from 34 to 180 g with a mean value of 82.8 g in prostate cancer patients. The overall mean prostate size was 70.1 g. **Conclusion:** Saline B-TURP was a safe surgery for bladder

outlet obstruction in either benign prostate hyperplasia or prostate cancer patients.

Keywords

Saline B-TURP, BPH, Prostate Cancer

1. Introduction

Open prostatectomy has long been the only bladder outlet obstruction's surgery available in Benin. It is prone to postoperative bleeding and infections and is not suitable for prostate cancer-induced bladder outlet obstruction.

The prostatic bladder outlet obstruction surgery has turned minimally invasive with several types of procedures such as transurethral resection [1], laser enucleation [2], water-driven ablation techniques (*i.e.*, aquablation [3], connective water vapor energy ablation [4]), etc. The transurethral resection of prostate has been using monopolar diathermy as cutting energy for years [5]. Monopolar transurethral resection of prostate (M-TURP) exposes the patient to glycocholate-induced TUR syndrome [1] [6]. Saline Bipolar transurethral resection of prostate (B-TURP), which uses sterile 0.9% saline solution as bladder irrigation fluid, reduces bleeding and avoids TUR syndrome [7]. TURP has recently been introduced into West Africa [8] [9]. In Benin, the former Military teaching Hospital of Cotonou performed its first saline B-TURP in 2014. And in the last decade, TURP has been swiftly spreading to many public and private health care institutions in the country. It is time to evaluate the TURP's path we have run so far.

2. Objective

We aim to evaluate the results of saline bipolar transurethral resection of prostate (B-TURP) practiced at the former Military Teaching Hospital of Cotonou.

3. Patients and Method

We conducted an observational study of saline bipolar transurethral resection of prostate (B-TURP) at the former Military Teaching Hospital of Cotonou. Every patient who underwent the B-TURP procedure from November 17, 2014, the day we performed the first saline Bi-TURP, up to September 7, 2022, the day our government handed over the hospital to civil administration, was included in the study.

3.1. B-TURP Procedure

The saline Bi-TURP was like classic endoscopic transurethral resection of prostate. The patient was installed in lithotomy position. We inserted the resectoscope into the bladder through the meatus and the urethra. We inspected the urethral and bladder lumen to rule out any other lesion. We started to cut chips

of the median lobe of the prostate from the bladder neck down to the proximal edge of the veru montanum before we resected the lateral lobes one after the other. Our equipment was a Storz AUTOCON II™ bipolar bistoury. The resectoscope was a 360° rotatory 26 Fr one. No neutral pad was needed. We used a 30° telescope. The irrigation fluid was sterile 0.9% saline solution. We used Braun™ 3 liter-pouches of saline solution. We used the cauterization ball instead of the loop to stop important bleedings. We ended the procedure by removing prostate chips from the bladder by means of Coloplast EasiVac™ aspiration device. We inserted a Coloplast 20 Fr 2 way-Foley catheter with Dufour tip into the bladder for post-procedure saline irrigation.

3.2. Preoperative Precautions

We performed urine culture in every patient. Any urinary infection was treated with a pathogen's sensitivity-adapted antibiotics, starting 48 through 72 hours before the saline Bi-TURP. Patients with no urinary infection were hospitalized in the afternoon the day before the procedure. Anti-clotting agents were stopped at least 5 days before the procedure. All patients were evaluated by the anesthetist and the cardiologist. We removed indwelling catheter as we moved the patient from the ward to the operation room. All our patients got spinal anesthesia and 1 g intravenous injection of amoxicillin-clavulanic acid as antibiotic prophylaxis. All patients were mobilized on the first postoperative day and encouraged to walk.

3.3. Data Collection and Analysis

We retrospectively collected from patients' medical records, data such as age, comorbidities, previous surgery, type of bladder outlet obstruction, PSA level, concomitant surgery, complications, duration of hospitalization, and pathology report. We started the data collection from November 17, 2014, the day we performed the first saline Bi-TURP, up to September 7, 2022, the day our government handed over the hospital to civil administration. We used Excel® 2019 to make a descriptive analysis (*i.e.*, sums, means and proportions) of the collected data.

4. Results

Patients' characteristics are summarized in **Table 1**.

Saline Bi-TURP was performed in 60 consecutive patients. Their mean age was 69.1 years (range: 48 - 85). Of the 60 patients, 13 (21.7%), 2 (3.3%), and 2 (3.3%) respectively had a history of hypertension, asthma, and inguinal hernia repair. The procedure was indicated in 22 (36.7%), 32 (53.3%), 3 (5%), and 3 (5%) patients, respectively for acute urinary retention, chronic urinary retention, obstructive renal failure, and unresponsiveness to alpha-blockers. 35 (58.3%) patients had prostate cancer (PCa). 25 (41.7%) patients had benign prostate hyperplasia (BPH). The mean PSA level in the prostate cancer patients was 424.7

Table 1. Patients' characteristics.

| Patients | |
|---|---------------------|
| Number | 60 |
| Mean age in years (<i>range</i>) | 69.1 (48 - 85) |
| Hypertension | 13 (21.7) |
| Asthma | 2 (3.3) |
| Previous hernia repair | 2 (3.3) |
| BOO surgery indications | |
| Acute urinary retention | 22 (36.7) |
| Chronic urinary retention | 32 (53.3) |
| Obstructive renal failure | 3 (5) |
| Prostate disease | |
| n patients with BPH (%) | 25 (41.7) |
| n patients with prostate cancer (%) | 35 (58.3) |
| Preoperative PSA in ng/mL: mean (<i>range</i>) | |
| BPH | 7.1 (0.96 - 33.15) |
| Prostate cancer | 424.7 (4.35 - 3015) |
| Concomitant surgery | |
| Urethrotomy | 2 (3.3) |
| Inguinal hernia repair | 2 (3.4) |
| Complications | |
| re-TURP | 7 (11.7) |
| Preoperative urinary infection | 5 (8.3) |
| Number of days inward (% <i>patients</i>) | |
| 3 | 53 (88.3) |
| 4 to 5 | 7 (11.7) |

ng/mL (range: 4.35 - 3015). The mean PSA level in BPH patients was 7.1 ng/mL (range: 0.96 - 33.15). The ISUP grade group data was available in 28 prostate cancer patients' records. The cancer in 6 (21.4%), 6 (21.4%), 4 (14.3%), 4 (14.3%), and 8 (28.6%) patients was respectively ISUP grade grouped 1, 2, 3, 4, and 5. No patient got a postoperative blood transfusion. The duration of postoperative hospitalization was 3 to 5 days. 5 (8.3%) patients, *i.e.*, 3 (12%) BPH and 2 (5.7%) PCa patients got preoperative urinary tract infection. The causative bacteria were *Escherichia coli* in 3 (60%) patients, *Klebsiella pneumoniae* in 2 (40%) patients, and multi-resistant *Acinetobacter* as a metachronous infection to *Escherichia coli* in 1 (20%) patient (**Table 2**). All the infections were associated with indwelling Foley catheter. 10 (16.7%) patients, *i.e.*, 7 (28%) BPH and 3 (8.6%) PCa patients had a prostatic median lobe. 7 (11.7%) patients, *i.e.*, 3 (12%) BPH and 4 (11.4%) PCa patients, got a second resection to recover full and

Table 2. Germs identified in preoperatively infected patients.

| Germ | Patients infected <i>n</i> (%) | Patients with MRG* <i>n</i> (%) |
|------------------------------|--------------------------------|---------------------------------|
| <i>Escherichia coli</i> | 3 (60) | 0 |
| <i>Klebsiella pneumoniae</i> | 2 (40) | 0 |
| <i>Acinetobacter</i> ** | 1 (20) | 1 (20) |

*Multi-resistant germ, **co-infection with *E. coli* in 1 patient.

Table 3. Patients' prostate size.

| | BPH* | Prostate cancer | Total |
|----------------------------|------|-----------------|-------|
| Patients (<i>n</i>) | 21 | 15 | 36 |
| Prostate size (<i>g</i>) | | | |
| min | 22 | 34 | 22 |
| max | 123 | 180 | 180 |
| mean | 61.1 | 82.8 | 70.1 |
| Median prostate lobe | 7 | 3 | 10 |

*Benign prostate hyperplasia.

efficient spontaneous micturition. 4 (6.7%) patients underwent concomitantly with the B-TURP a second procedure, *i.e.*, urethrotomy in 2 (3.3%) patients and inguinal hernia repair 2 (3.3%) other patients. One BPH patient was safely operated despite his Medtronic pacemaker as the cardiologist stressed that it did not contra-indicated the procedure. Data on prostate size were available in the records of 36 (60%) patients, *i.e.*, 21 (84%) BPH patients and 15 (42.9%) PCa patients (Table 3). Prostate size ranged from 22 to 180 g with a mean value of 70.1 g in the 36 patients. It ranged from 22 to 123 g with a mean value of 61.1 g in BPH patients, and from 34 to 180 g with a mean value of 82.8 g in PCa patients. The pathologists weighted the resected prostate chips in only 11 (18.3%) patients, *i.e.*, 6 (24%) BPH patients and 5 (14.3%) PCa patients. The measured chips' weight ranged from 4 to 27 g with a mean value of 14.3 g. It ranged from 4 to 27 g with a mean value of 14.6 g in the BPH patients, and from 4 to 20 g with a mean value of 14 g in the PCa patients. One patient was converted into prostatectomy for intractable post B-TURP hemorrhage. His prostate was nodular and weighted 120 g. He had an obstructive renal failure. On the long run, bladder outlet obstruction recurred in 4 (6.7%) patients, *i.e.*, chronic urinary retention with was 123 mL post-void residue in 1 (4%) BPH patient at 8 years 5 months, acute urinary retention in 3 (8.6%) PCa patients at respectively 11 months, 1 year 7 months, and 3 years 4 months.

5. Discussion

Urinary retention was the reason for the admission of 95% of the patients. It was acute in 36.7% patients and chronic with or without obstructive renal failure in

58.3% patients. This is not astonishing as patients will not often seek care for non-symptomatic BPH or PCa. Some authors had reported that 45.7% of their patients were admitted for urinary retention [10]. 46.15% of other authors' patients were admitted for urinary retention [11]. In contrast, Molamba *et al.* performed B-TURP in 46.1% of their patients for dysuria, and in only 23.03% of their patients for acute urinary retention [12]. 58.3% of our patients had advanced and bladder outlet obstructive prostate cancer, which underlined the dire need for transurethral surgery of prostate in our environment. Chronic urinary retention and urethro-vesical catheterization had led to preoperative urinary infection in 5.8% patients. Like in Yenli's study [13], *Escherichia coli* was the most frequent causative germ. Despite antibiotic resistance issue, preoperative infection must be correctly treated before the procedure is carried out, to avoid in the TURP patients, complications such as prostatitis, orchitis, pyelonephritis, or septicemia. One patient was infected by a multi-drug resistant *Acinetobacter*. Self-medication was common and many patients bore indwelling Foley catheter for months or years as they feared a supposedly inevitable postoperative death.

Out of our 60 patients, none got a postoperative blood transfusion, which grossly showed that the saline B-TURP causes little bleeding. Other teams which used M-TURP have reported 7% and 5.12% blood transfusion for bleeding [8] [11]. In one patient with a 120 g sized prostate, open prostatectomy had been necessary to stop post B-TURP bladder clotting. Thus, the procedure might not be suitable for big sized prostate. Most of the patients had prostate cancer, meaning that more prostate cancer had triggered bladder outlet obstruction than BPH despite the hospital prevalence of BPH was higher in our environment [14]. In Molamba's B-TURP practice, 70% of the patients had BPH and the mean prostate volume was 104.8 ± 60.4 mL [12].

Open prostatectomy has long been the only bladder outlet obstruction's surgery available in Benin [15]. It is prone to postoperative bleeding and infections. Another challenging situation for the open prostatectomy is the high incidence of advanced prostate cancer [16] [17] [18] which often trigger bladder outlet obstruction. Patients in Benin are peculiarly frightful for both prostate diseases and prostate surgery. They think that prostate surgery is deadly. Thus, patients with prostate diseases prefer traditional herbal therapy and indwelling catheter despite its discomfort. It is not uncommon to encounter patients that have been bearing indwelling catheter for months or even years. We cannot deny that some woeful outcomes of prostate surgery in unqualified or unexperienced hands may have fueled the population's attitude towards prostate surgery. But we must move prostate diseases management forward. B-TURP turned out to be a good response to our patients' reluctancy towards prostate surgery.

6. Conclusion

Saline B-TURP was a safe surgery for bladder outlet obstruction in either benign prostate hyperplasia or prostate cancer patients. It was a sound surgical option in

our populations known for their legendary fear for prostate diseases and stubborn reluctance for open prostatic surgery.

Limitations

This study was a single center study.

Conflicts of Interest

None.

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