

Transurethral Resection of the Prostate (TRUP) for the Treatment of Benign Prostatic Hyperplasia (BPH) in Central Cote D'Ivoire: Indications and Results

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How to cite this paper: Avion, K.P., Akassimadou, N., Alloka, V., Kamara, S. and Dje, K. (2024) Transurethral Resection of the Prostate (TRUP) for the Treatment of Benign Prostatic Hyperplasia (BPH) in Central Cote D'Ivoire: Indications and Results. *Open Journal of Urology*, **14**, 27-38.
<https://doi.org/10.4236/oju.2024.142004>

Received: July 6, 2023

Accepted: February 1, 2024

Published: February 4, 2024

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Abstract

Background: Benign prostatic hyperplasia (BPH) is defined histologically as adenomyofomatous hyperplasia of the transitional zone of the prostate. It remains the most common benign tumour in men over the age of 50, and transurethral resection of the prostate (TURP) remains the surgical treatment of choice. **Objectives:** To determine the indications and present our results of transurethral resection of the prostate. **Patients and Methods:** After obtaining approval from the ethics committee of the private hospital and the university hospital of Bouaké (Côte d'Ivoire), we conducted a cross-sectional study of transurethral resection of the prostate (TURP) to treat benign prostatic hyperplasia (BPH) between January 2021 and April 2023. All patients and their families were informed beforehand and had signed an informed consent form. All patients with benign prostatic hyperplasia (BPH) with ultrasound weight of less than 80 grams were included. The following parameters were studied: age, reason for consultation, ultrasound prostate weight of benign prostatic hyperplasia, indication for TURP, duration of operation, blood loss, duration of post-PRT urinary drainage, length of hospital stay, morbidity and mortality, and outcome. **Results:** 39 patients with a mean age of 58.3 years (57 - 77 years) underwent transurethral resection of the prostate (TURP). TURP was indicated in 46.15% (n = 18) of cases of refractory acute urinary retention with failure of the urinary catheter removal test, 17.94% (n = 7) of cases of lower urinary tract disorders that were incapacitating despite treatment, 15.38% (n = 6) of cases of refractory or recurrent urinary tract infection, 10.25% (n = 4) of cases of failure of medical treatment and 10.25% (n = 4) of cases of iterative hematuria. The mean duration of TURP was 53.68

min (48 - 57), the mean weight of the resected prostate was 58.7 g (35 and 83 g), blood loss was minimal in 92.30% (n = 36), the mean duration of irrigation-washing was 2.5 days (1 - 3 days), the mean time for urinary catheterisation was 2.45 days (3 and 4 days), 5.12% (n = 2) of patients presented complications such as hemorrhage compensated by a blood transfusion. One patient developed orchiepididymitis (2.56%). The average hospital stay was 3.75 days (3 - 5 days). Pathological examination was in favour of BPH in 92.3% (n = 36) and the coexistence of BPH and prostate adenocarcinoma in 7.69% (n = 3). The results of TURP were considered good in 94.87% (n = 37). Mortality was nil. **Conclusion:** In view of our results, TURP is a reliable, elegant minimally invasive technique with low morbidity and mortality.

Keywords

BPH, TURP, Endo-Urology, Prostate

1. Introduction

Benign prostatic hyperplasia (BPH) is defined histologically as adenomyofomatous hyperplasia of the transitional zone of the prostate. It remains the most common benign tumour in men over the age of 50 [1]. Its main risk factors are dihydrotestosterone (DHT), ageing and geographical location [2]. The circumstances in which it is discovered are many and varied but can be summed up as obstructive and irritative disorders of the lower urinary tract, progressive complications and chance discovery. Although it is a benign condition, it has been shown to have a negative impact on the patient's health-related quality of life [3]. Initial treatment is conservative, using phytotherapy, alpha-blockers and 5-alpha reductase inhibitors as mono- or dual therapy [3]. However, according to the 2021 American Urological Association guidelines, surgical treatment is recommended for patients with refractory urinary retention, renal insufficiency, recurrent hematuria, bladder stones, recurrent urinary tract infections, or failure of medical treatment.

Despite the ongoing development of new minimally invasive surgical methods, transurethral resection of the prostate (TURP) remains the gold standard in the treatment of benign prostatic hyperplasia (BPH), with over 90% of patients returning to normal or improved voiding during the 10-year follow-up period [4].

The aim of our study is to determine the indications for TURP and to present our results.

2. Patients and Methods

2.1. Study Design and Approval

After obtaining approval from the ethics committee of the private hospital and the university hospital of Bouaké (Côte d'Ivoire), we conducted a cross-sectional

study of transurethral resection of the prostate (TURP) to treat benign prostatic hyperplasia (BPH) between January 2021 and April 2023. All patients and their families were informed beforehand and had signed an informed consent form.

2.2. Inclusion and Non-Inclusion Criteria

All patients with benign prostatic hyperplasia (BPH) with an ultrasound weight of less than 80 grams were included. Patients with a prostate weight greater than 80 grams or with bladder lithiasis detected by ultrasound or cystoscopy were excluded from our series.

All TURP procedures were performed after a preoperative work-up including blood count, partial thromboplastin time (PTT), prothrombin rate (PRT), uremia, creatinemia, blood grouping and electrocardiogram. We ensured that the urine was sterile by means of Urine Cytobacteriological Examination (UCE) All patients underwent a pre-anaesthetic consultation to determine the route of anaesthesia. The various TURPs were performed by the same surgeon-urologist using a 26 CH sheath resection with 30° optics, a monopolar electric current and a continuous irrigation system using glycine with cutting/coagulation set at 130°/70W. At the end of the procedure, the resected prostatic copal tissue is recovered using the Ellik bulb, weighed on a digital balance and fixed in formalin for anatomopathological examination. Bleeding areas were hemostasis using an electric ball and a dual-current DUFOUR catheter was inserted, the balloon of which was inflated to 30 ml for continuous bladder irrigation.

Data were collected using a survey form containing the parameters studied. Data were entered using Word software. Epi-info 7 software was used to analyse the data. The following parameters were studied: age, reason for consultation, ultrasound prostate weight for benign prostatic hyperplasia, indication for TURP, and duration of blood loss. The duration of urinary drainage after TURP, the length of hospital stay, morbidity and mortality, and the outcome.

Thus,

- Operative time was calculated as the time elapsed between the introduction of the resection and placement of the dual-stream Dufour catheter.
- The proportion of the prostate resected was calculated as the ratio of the volume resected to the volume of the prostate ultrasound pre-operatively.
- Blood loss was calculated as the difference between the preoperative and postoperative haemoglobin levels on Day 1, *i.e.* 24 hours after TURP.

Also, the results of TURP were judged to be good, fair, or poor 90 days after the operation, when the patient was seen at the second postoperative appointment.

- Good results:
 - Clinical sign = 00;
 - Prostate size < 20 g;
 - Post-void residue < 10 ml.
- Average results: - weight < 20 g;
 - Post Micturition Residue < 10 ml;

- Mild discomfort.
- Poor results:
 - Persistence of symptoms;
 - Post Micturition Residue = 50 ml;
 - Prostate weight = 25 g.

3. Results

3.1. Epidemiological Data

- Age

The mean age of the patients was 58.3 years, ranging from 57 to 77 years.
- Occupation

Farmers were the most represented with 46.15% (n = 18).
- Ethnicity

Baoulé was the dominant ethnic group with 53.84% (n = 21).
- Marital status

Cohabiting patients were more common at 46.15% (n = 18).

3.2. Clinical Data

3.2.1. Mode of Admission

74.35% of patients were self-referred (n = 29).

3.2.2. Reason for Consultation

Acute retention of urine was the most frequent reason for consultation with 46.15% (n = 18) followed by dysuria 30.76% (n = 12). (**Table 1**)

3.2.3. Progression Time

43.58% (n = 17) of patients consulted between 6 and 1 year after the onset of symptoms.

3.2.4. Comorbidity and History

79.48% of patients had no comorbidity (n = 31).

- **Surgical history**

38.46% of patients had undergone a hernia repair (n = 15).

Table 1. Breakdown of patients by reasons for consultation.

REASONS FOR CONSULTATION	NUMBERS	PERCENTAGE %
Dysuria	12	30.76
Pollakiuria (PKU)	3	7.69
Urinary burning	1	2.56
Haematuria	4	10.25
Acute retention of urine (ARU)	18	46.15
Urinary urgency	1	2.56
TOTAL	39	100

- **Urological history**

10.25% (n = 4) of patients were being monitored for benign prostatic hyperplasia (BPH).

3.2.5. Physical Signs

46.15% (n = 18) of patients presented with a bladder globe. A trans-urethral urinary catheter was inserted urgently to drain the urine in **Table 2**.

3.2.6. Rectal Examination Results

All the patients had the characteristics of benign prostatic hypertrophy on rectal examination. The prostate was enlarged, with a smooth surface and an elastic consistency with loss of the median sulcus.

3.2.7. Estimated Prostate Weight on Digital Rectal Examination

The average weight of the prostate on digital rectal examination was 70 g with extremes of 40 and 100 g.

3.3. Paraclinical Data

3.3.1. Vesico-Prostatic and Renal Ultrasonography

✓ Prostate weight

The mean ultrasound weight of the prostate was 67.5 g with extremes of 47 and 93 g.

✓ Post-void residue

The mean post-void residue was 176 ml with extremes of 70 ml and 307 ml.

✓ Impact on the bladder and upper urinary tract.

28.20% (n = 11) of patients had an impact on the bladder and upper urinary tract, **Table 3**.

3.3.2. Prostate Specific Antigen (PSA)

The mean PSA level was 2.1 ng/ml with extremes of 0.56 and 9.5 ng/ml. All patients with a PSA greater than 4 ng/ml underwent prostate biopsy plus anatomopathological examination, which excluded prostate adenocarcinoma.

3.3.3. Renal Work-Up

07.69% (n = 3) of patients had obstructive renal failure. Patients underwent urinary catheterisation for urine drainage. Regular monitoring of renal function was performed for 45 days until renal function returned to normal.

Table 2. Distribution of patients according to physical signs.

PHYSICAL SIGNS	NUMBERS	PERCENTAGE (%)
Oedema of the lower limbs	11	28.20
Bladder globe	18	46.15
Inguinal swelling	3	7.69
Scrotal swelling	7	17.94
TOTAL	39	100

Table 3. Distribution of patients according to impact on the bladder and upper urinary tract.

BLADDER IMPACTS	NUMBERS	PERCENTAGE %
Urethro hydronephrosis	7	17.94
Bladder lithiasis	00	00
Bladder diverticulum	4	10.25
No repercussions	28	71.79
TOTAL	39	100

3.3.4. Urine Cytobacteriological Examination (UCE)

E. coli was the germ most frequently encountered, accounting for 30.76% (n = 12). These patients were treated with antibiotics for 14 to 21 days. Urine was sterile at the last check after antibiotic treatment in **Table 4**.

3.4. Progressive Complications

92.30% (n = 36) of patients had progressive complications of BPH in **Table 5**.

3.5. Therapeutic Data

3.5.1. Indication

In 46.15% (n = 18) of cases, TURP was indicated for refractory acute urinary retention (AUR) with failure to remove the urinary catheter in **Table 6**.

3.5.2. Duration of the Procedure

The average duration of TURP was 53.68 minutes, with extremes of 48 and 57 minutes.

3.5.3. Average Weight of Prostate Resected

The average weight of the resected prostate was 58.7 g with extremes of 35 and 83.

3.5.4. Blood Loss

Blood loss was minimal in the majority of patients 92.30% (n = 36). However, three patients had significant blood loss (7.69%) requiring compensation by blood transfusion.

3.5.5. Time of Bladder Lavage Irrigation

The average duration of bladder irrigation-washing was 2.5 days, with extremes of 1 and 3 days.

3.5.6. Time to Urinary Drainage Post TURP

The mean time for urinary catheterisation was 2.5 days, with extremes of 3 and 4 days.

3.5.7. Complications

5.12% (n = 2) of patients presented with a complication of haemorrhage due to escars falling.

2.56% (n = 1) presented with orchiepididymitis.

Table 4. Distribution of Patients according to Urine Cytobacteriological Examination (UCE) result.

URINE CYTOBACTERIOLOGICAL EXAMINATION (UCE)	NUMBERS	PERCENTAGE %
Klebsiella pneumonia	3	7.69
Escherichia coli	12	30.76
Proteus mirubis	2	5.12
Pseudomonas aeruginosa	1	2.56
Serratia	2	5.12
Sterile urine	19	48.71
TOTAL	39	100

Table 5. Distribution of patients according to progressive complications.

COMPLICATIONS	NUMBERS	POURCENTAGE %
Haematuria	4	10.25
AUR	18	46.15
Uretro hydronephrosis	7	17.94
Bladder diverticulum	4	10.25
Renal insufficiency	3	7.69
No complications	3	7.69
TOTAL	39	100

Table 6. Distribution of patients according to indication for TURP.

INDICATIONS	NUMBERS	PERCENTAGE %
Iterative haematuria	4	10.25
Failure of the AUR test refractions of catheter removal	18	46.15
Failure of medical treatment	4	10.25
Refractory or recurrent urinary tract infection	6	15.38
TUBA is invalid under medical treatment	7	17.94
TOTAL	39	100

3.5.8. Length of Hospital Stay

The average length of stay was 3.75 days, with extremes of 3 and 5 days.

3.5.9. Pathological Findings

Pathological findings were consistent with adenomyofribrroma of the prostate in 92.3% (n = 36). 7.69% (n = 3) had BPH + Adenocarcinoma of the prostate associated with benign prostatic hypertrophy cohabitation.

3.5.10. Result Assessment

The result was considered good in 94.87% (n = 37).

In 5.12% (n = 2), the result was judged to be poor. These two patients benefited from a second TURP and presented a good result after the second TURP.

3.5.11. Mortality

Mortality was nil in our series.

4. Discussion

Transurethral resection of the prostate (TURP) is the cornerstone of surgical treatment of benign prostatic hyperplasia (BPH) weighing less than or equal to 80 g, and with improving surgical skill and technology, TURP is also being used in patients with larger prostates and is as safe and effective in small as in large prostates [5] [6] [7]. Trans-urethral resection of the prostate (TURP) is not only the current standard surgical method but often the preferred surgical method for benign prostatic hyperplasia [5]. In the present study, we analysed both the indications and results of transurethral resection of the prostate (TURP) for the surgical management of benign prostatic hyperplasia (BPH). In this study, we showed that TURP was indicated mainly for acute urinary retention with failure of the urinary catheter removal test in 46.15%, lower urinary tract disorders that were invalid despite medical treatment in 17.94%, refractory or recurrent urinary tract infection in 10.38%, failure of medical treatment in 10.25% and recurrent hematuria in 10.25%.

Our results are in line with the results of studies previously published in the literature showing that recourse to surgery for the treatment of benign prostatic hyperplasia is only decided if the patient presents progressive complications of the pathology [8] [9] [10] [11]. The indications for transurethral resection of the prostate (TURP) in the present study are in line with the recommendations of the American Urological Association in 2021. For this institution, surgical management of benign prostatic hyperplasia is recommended for patients with refractory urinary retention with inability to wean from the urinary catheter, renal failure, recurrent microscopic haematuria, bladder stones and recurrent urinary infarction [12]. However, in 2021, ZHU [13] reported in his study carried out in CHINA indications for TURP in patients refusing drug treatment.

The mean duration of transurethral resection of the prostate (TURP) in the present study was 53.68 minutes. Resection time has evolved considerably and has also improved in relation to publications dating from 1990 to 2010. The mean resection time in 1990 was 26.2 minutes. It increased to 32.1 minutes in 2000, but then fell to 30.3 minutes in 2010 according to YOUNG in his study on the evolution of prostate transurethral resection [14]. However, DIAKITE [15] reported an average duration of 40 minutes in MALI. These different times confirm the thesis that transurethral resection of the prostate (TURP) is a minimally invasive technique renowned for its short operative time.

Blood loss in our study was minimal in 92.30% of patients. However, 7.69% of

patients had significant blood loss requiring blood transfusion. This rate is higher than those reported by GEREMEW [16] and DUTT KANT [17]. This result observed in the present study could be explained by the significant prostatic weight resected in these patients.

The mean duration of bladder irrigation-washing in our series was 2.5 days, which is longer than that reported by DIAKITE in MALI who reported 36 hours [15]. This duration is explained by the surgeon's caution.

The average duration of the urinary catheter was 2.45 days in our series. This result is lower than that reported by DIAKITE in MALI, who reported an average duration of 3 days [15]. In the series by MAMOULAKIS [18], this period ranged from 18.4 to 96 hours. According to some authors in the literature, this time may be related to the weight of the prostate that has been resected and the colour of the urine after irrigation has been stopped [19].

The complications of transurethral resection of the prostate (TURP) are well-known in the literature. They include hemorrhage, blood clot retention, urinary tract infection, urethral stricture, secondary sclerosis of the bladder neck and retrograde ejaculation [1] [2] [5] [7]. Other rare complications include stroke, recto urethral fistula and bladder explosion [20] [21] [22]. In our series, we recorded 5.12% of complications. This result is in line with those reported by other authors [15] [16] [17]. This confirms that transurethral resection of the prostate (TURP) is a technique with few complications.

In the present study, the average hospital stay was 3.75 days, compared with 6 days in the study by LOTTERSTATTER [8] and 2.1 days for GEREMEW [16]. This short hospital stay reflects the elegance of transurethral resection of the prostate (TURP). It is a technique that allows patients to resume their activities quickly while reducing the convalescence period.

The results of trans-urethral resection of the prostate (TURP) were considered good in the present study at 94.87%. This result is consistent with the success rates reported by various authors in the literature [8] [10] [13].

The strength of our study lies in its rigorous methodology, the first to our knowledge to be carried out in Bouaké in central Côte d'Ivoire. However, it does have its limitations. It is a cross-sectional and descriptive study, and the results therefore merit external validation with a larger, independent sample. It would be useful for future studies with a more significant sample to be carried out in order to assess the substance of our results.

However, we believe that these results are clinically relevant because of their strong characterization in a real-life context.

5. Conclusion

The results of the present study have shed light on the various indications and outcomes of transurethral resection of the prostate (TURP). Our findings confirm the delay in consulting patients in our practices with regard to the frequency of urinary retention with failure to wean the catheter, which accounts for the

long evolution of benign prostatic hypertrophy. These results show that TURP is a safe, effective, and attractive surgical method with few complications. From now on, it should become the benchmark for surgical management of BPH in central Côte d'Ivoire.

Financial Support

No financial support for this research.

Conflicts of Interest

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

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