Original Research Article

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Comparative evaluation of different modalities of treatment in benign prostatic hyperplasia at tertiary care teaching institute

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ABSTRACT

Background: Benign prostatic hyperplasia (BPH) is the most common disease occurring in men as the age advances. There are various treatment modalities available, amongst which trans-urethral resection of prostate (TURP) is widely used but role of open Freyer's prostatectomy and medical management can't be ignored at the same time. This study was done to compare different modalities of treatment, to evaluate the individual modality in view of its efficacy, complications and patient satisfaction, to compare the different modalities in their efficacy for management of BPH and their complication profile, to suggest the best form of therapy that can be offered to patients.

Methods: A retrospective comparative study was conducted including 90 patients having benign prostatic hyperplasia (BPH) were enrolled for the study and randomly divided into three groups of 30 patients each. Group I consists of patients undergoing for Freyer's prostatectomy, Group II consists of patients undergoing TURP and in Group III patients were managed conservatively with medical management.

Results: Temporary Incontinence of urine was the most common complication occurred found in 6 cases (20%) in Freyer's prostatectomy group I and in 3 cases (10%) in TURP group II; per-urethral catheter was removed between 2-5 days in all 30 cases (100%) of TURP, but in Freyer's prostatectomy it was kept up to average 10 days (8-18); All 30 cases (100%) of in Group II where TURP done were discharged within 6 days of surgery whereas in Group I where Freyer's prostatectomy done, most of the cases 21 (70%) were discharged between 11-15 days post-operatively. In Group III, patients were managed by medical management patients, 11 cases (36.67%) presented with acute urinary retention (AUR) and 19 (63.33%) patients presented with lower urinary tract symptoms (LUTS) without retention.

Conclusions: TURP is having definite advantage over Freyer's prostatectomy, because Length of hospitalization, postoperative complications are less frequent. Transurethral resection is the method of choice in the treatment of benign prostatic hyperplasia especially in patients with mild to moderate prostatic enlargement and in the elderly patients with co-existing medical disease. Endoscopic instruments, training and more experience is required for TURP. Medical management can delay immediate surgery but later on surgical management is usually required.

Keywords: Benign prostatic hypertrophy, Freyer's prostatectomy, Medical Management of BPH, TURP

INTRODUCTION

According to Sir Benjamin Brodie, "When hair becomes grey and scanty, when specks of earthy matter begins to be deposited in tunics of artery and when a white zone is formed at the margin of cornea at this same period the prostate gland usually I might perhaps say invariably becomes increased in size". Benign prostate hypertrophy (BPH) is one of the most common benign tumour in men and its incidence is age related. BPH is age dependent

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with initial development usually after 45 years. By 60 years of age its prevalence is greater than 50% and by age 85 it is as high as 90%. Acute urinary retention because of prostatic enlargement is a major geriatric problem.²

BPH can be associated with bothersome lower urinary track symptoms (LUTS) that affect quality of life by interfering with normal daily activities and sleep patterns. It is also associated with complications such as acute urinary retention, haematuria, renal function impairment etc. Open transvesical prostatectomy i.e. Freyer's (OP) and transurethral resection of the prostate (TURP) are two old surgical procedures performed for patients with benign prostatic hyperplasia (BPH).

Currently, TURP is considered as the reference or standard treatment for the prostate less than 70 to 80 g.³⁻⁵ Open prostatectomy (OP) is still being performed for operations of the prostates in which TURP is preferable in many developing and even developed countries. Percent of OP in the late 1990 and early 2000 in Sweden, France, Italy, and the Mediterranean coasts ranged from 14% to 40%.⁶⁻⁹ Recently, surgical methods and anaesthesia techniques improved so complications of OP have decreased. Besides, patients are satisfied with OP regarding its functional outcome and durability. Surgery for BPH is done in old age man who usually has comorbid conditions that can contribute to mortality and morbidity associated with surgery.¹⁰⁻¹¹

Open transvesical prostatectomy is not currently recommended for moderate-sized prostates. ¹² The transurethral resection of prostate (TURP) is preferred in prostatic surgery. ^{13,14} Acute urinary retention (AUR) is an important complication of BPH, can affect up to 2.5% of men seen urologic practice each year. It is main indication for surgery.

However, surgery conducted under these conditions is associated with higher morbidity. Medical management for AUR due to BPH can be bridging alternative between episodes of retention and definitive treatment, so as to avoid morbidity associated with emergency surgery. It can also be a viable treatment option for those patients who are at high risk for surgery and those who are not willing for surgery. Various medical therapies investigated and used for BPH are Alpha adrenergic blockers, androgen supressors aromatase inhibitors and plant abstracts. ¹⁵

Both surgical and medical line of treatments has their own advantages and limitations. The aim of this study is to find out the bases for selecting the proper method under various circumstances.

METHODS

A retrospective comparative study was conducted in a tertiary care teaching hospital over the period of two years from April 2013 to March 2015 in a surgical unit.

Total 90 patients with signs and symptoms of benign prostatic hyperplasia (BPH) were enrolled for the study and randomly divided into three groups of 30 patients each. Group I consists of patients undergoing for Freyer's Prostatectomy, Group II consists of patients undergoing TURP and in Group III patients were managed conservatively with medical management i.e. Tab. terazosin (2 mg-5 mg) alone (If prostatic volume <40 gm) or with tablet finasteride (5 mg) daily (If volume >40 gm).

All males between age of 45 years and 85 years are included in study, Out of many treatment options in open surgery, Freyer's prostatectomy and in endourology mainly transurethral resection of prostate (TURP) is routinely performed in our unit, so in this study the comparison of Freyer's prostatectomy, TURP and medical management was done.

Exclusion criteria

- Patient age <45 years and >85 years
- Patients unfit for either general or spinal anaesthesia
- Previous history of surgery for prostate
- Patients with severe anemia, hematological disorders, hepatic or renal conditions and immunocompromised status

Group I and Group II patients were investigated and then were taken for surgery. Standardized surgical protocols were followed. In this study normal saline was used as a irrigating fluids until haematuria stopped Postoperatively.

This irrigation was given through three way per urethral Foley' catheter. No suprapubic catheterization was done in any Freyer's prostatectomy. Post-operative period up to discharge was observed and then followed-up. All the patients were followed up for 1 year.

- All patients of both groups were monitored for
- Presenting symptoms and associated conditions
- Organisms present in urinary examination
- Per-operative complications
- Weight of prostate gland removed
- Weather blood transfusion required or not
- Post-operative haematuria duration
- Post-operative complications
- Post-operative catheterized days
- Length of hospital stay
- Medically managed patients were observed for improvement of symptoms

RESULTS

In this study patient's age ranges from 46-85 years, with highest patients 36 (40%) in 56-65 years age group, followed by 66-75 years age group 33(36.67%).

In this study most common symptom associated with BPH was frequency of micturition in 84 out of 90 total

patients (93.33%) and, Nocturia was the second most common associated symptom in 81 patients (90%)

Table 1: Age incidence.

Age	Group I (fi	reyer's prostatectomy)	Group II (ΓURP)	Group II (n	nedical management)
(years)	Number	Mean±SD	Number	Mean±SD	Number	Mean±SD
46-55	3	52.00±3.61	3	50.00±2.65	5	50.20±3.49
56-65	12	60.33±2.54	11	59.27±1.85	13	58.92±2.69
66-75	10	71.20±3.08	13	69.15±2.82	10	71.20±2.93
76-85	5	81.20±3.83	3	78.33±1.52	2	82.50±3.53

Table 2: Presenting symptoms with BPH.

Symptoms	Freyer's prostatectomy	TURP	Medical management	Total	Percentage
Difficulty in micturition(DM) (hesitancy in initiation of void)	27	30	23	80	88.89
Frequency of micturition (FM)	30	27	27	84	93.33
Burning micturition (BM)	18	19	15	52	57.78
Retention of urine (RU)	8	6	7	21	23.33
Poor stream of urine (PS)	18	15	15	48	53.33
Dribbling of urine (DU)	6	7	9	22	24.44
Urgency of micturition (UM)	6	4	12	22	24.44
Haematuria (H)	3	3	1	7	7.78
Nocturia (NR)	30	27	24	81	90.00

Table. 3 Associated conditions with BPH.

Associated condition	Freyer's prostatectomy	TURP	Medical management	Total	Percentage
Inguinal hernia	6	0	0	6	6.67
Hypertension	5	4	6	15	16.67
Haemorroids	2	0	0	2	2.22
Hydrocele	2	0	0	2	2.22
COPD	4	5	1	10	11.11
Ischemic heart disease	2	3	5	10	11.11
Bladder stone	2	0	0	2	2.22
Diabetes mellitus	2	1	2	5	5.56
Bladder diverticula	2	0	0	2	2.22

Table 4: Organisms isolated in urinary examination.

Organisms	Freyer's prostatectomy	TURP	Medical management
E-coli	6	5	7
Klebsiella	2	4	2
Psedomonas	-	-	1
Proteus	-	1	-
No Growth	12	10	10

Conditions treated simultaneously with prostatectomy

- Inguinal hernia in 6 cases
- Bladder stone in 2 cases

- Diverticulectomy in 2 cases
- Hydrocele in 2 cases.

In this study most common organism causing urinary tract infection associated with BPH is *E. coli* (30%).

Table 5: Pre-operative complication.

Complication	Freyer's prostatectomy	TURP	Total
Blockage of irrigation	4	1	2
Rupture of catheter ballon	2	0	1

In this study, blockade of irrigation during surgery was found in 4 cases of Freyer's prostatectomy whereas in cases of TURP blockade occurred in only 1 case. In

Freyer's prostatectomy case it occurred mostly during closure of bladder wall and it was due to blockage done due to clot which removed with help of asepto syringe while in TURP case catheter removed and bleeder identified with cystoscope and cauterization done and reinsertion of catheter done. In one patient of Freyer's prostatectomy balloon of catheter ruptured after inflating it into prostatic fossa. So catheter needed to be changed.

Table 6: Actual weight of prostate gland removed in surgery.*

Weight (gm)	Freyer's (n = 30)	TURP (n = 30)	Total (n = 60)	Percentage (%)
≤ 30 gms	14	23	37	61.67
> 30 gms	16	7	23	38.33

^{*} P value calculated by Fischer's exact test is 0.0326 considered significant (P value less than 0.05 is considered as statistically significant).

Table 7: Blood transfusion.**

Blood transfusion units	Freyer's prostatectomy	TURP	Total	Percentage
Not required	4	19	23	38.33
Required	26	11	37	61.67

^{***} P value calculated by Fischer's exact test is <0.0001 considered significant (P value less than 0.05 is considered as statistically significant).

Table 8: Post-operative hematuria.***

Post operative haematuria	Freyer's prostatectomy (30)	TURP (30)	Total	Percentage
≤2 Days	18	28	46	76.67
> 2 Days	12	2	14	23.33

^{***} P value calculated by Fischer's exact test is 0.0048 considered significant (P value less than 0.05 is considered as statistically significant).

Table 9: Post-operative complications.

Complications	Freyer's prostatectomy	TURP	Total	Percentage
Incontinence of urine (temporary)	6	3	9	15.00
Wound infection	3	0	3	5.00
Catheter block	0	1	1	1.67
Urethral stricture	3	1	4	6.67
Epididymo-orchitis	2	1	3	5.00
Burst/deflation of balloon of catheter	1	0	1	1.67

In this study <30 gm of prostatic tissue was removed in 23 cases (76.67%) of TURP whereas in Freyer's prostatectomy it was found in 14 cases (46.67%) only.

In this study blood transfusion was required in 26 cases (86.67%) whereas when patients were operated by TURP, blood transfusion was required in 11 cases (36.67%) only.

In this study, haematuria persists for more than 2 days and lasted up to 5 day in Freyer's prostatectomy group, 12 patients (40%) whereas it lasted for less than 2 days in 28 patients (93.33%).

In this study temporary incontinence of urine was the most common complication occurred. It was found in 6

cases (20%) in Freyer's prostatectomy group I and in 3 cases (10%) in TURP group II. However, it was controlled by perineal exercises and Faraday's stimulation. None of the patient in this Study developed permanent incontinence. In this study wound infection occur in 3 cases (10%) of Freyer's prostatectomy patients.

In this study one patient of TURP group had on catheter blockage in immediate post-operative period while there is no blockage of catheter in Freyer's Prostatectomy group. Reinsertion of three way Foley's catheter done gently per urethra and bulb inflated into bladder neck. 2 patient of Freyer's and 1 patient of TURP developed epididymo-orchitis which treated with antibiotics and scrotal support. 3 patients of Freyer's and 1 patient of

Table 10: Post-operative urethral catheter (kept in situ) days. ****

Days	Freyer's prostatectomy (n = 30)	TURP (n = 30)	Total (n = 60) percentage
≤ 5 days	0	30	50.00
6-10	19	0	31.67
11-15	10	0	16.66
>15	1	0	1.67

**** P value calculated by Chi-square test is <0.0001 considered significant (P-value less than 0.05 is considered as statistically significant).

TURP developed stricture in follow up which were treated with urethral dilatation regularly. In this study no patient of TURP developed electrolyte disturbances, haemolysis or myocardial ischemia, no death occurred during our study.

In this study urethral catheter was removed between 2-5 days in all 30 cases (100%) of TURP, but in Freyer's prostatectomy it was kept up to average 10 days (8-18).

In one patient of Freyer's prostatectomy it was kept long i.e. 16 days as there was suprapubic leak with persistent drain output from retro pubic drain.

Table 11: Length of hospital stay in days. *****

Length of hospital stay in days	Freyer's prostatectomy (n = 30)	TURP $(n = 30)$	Total (n = 60) percentage
<5	0	26	43.33
5-10	4	4	13.33
11-15	21	0	35.00
16-20	3	0	5.00
>20	2	0	3.33

***** P value calculated by Chi-square test is <0.0001 considered significant (P value less than 0.05 is considered as statistically significant).

In this study all 30 cases (100%) of in Group II where TURP done were discharged within 6 days of surgery whereas in Group I where Freyer's prostatectomy done, most of the cases 21 (70%) were discharged between 11-15 days post-operatively.

In Group III (medically managed patients) (n = 30)

Presenting symptoms

- Acute urinary retention (AUR): 11 (36.67%)
- Lower urinary tract symptoms (LUTS) without retention: 19 (63.33%).

Improvement with medical management in patients presented with acute urinary retention.

Improved: 3 (10.00%)Not improved: 8 (26.67%)

After presenting with AUR, Tab. Terazosin 2 gm started for 72 hour and then catheter trial given out of 11, 4 patient voided urine and one out of these four later on in 2nd week undergo retention. So 3 patients out of 11 benefited and prevented from immediate surgery and they enjoy their life with good quality. But in 8 patients where retention remained they undergo surgery later on.

Improvement with medical management in patients presented with LUTS without retention.

• Improved: 11 (36.67%)

• Not improved: 8 (26.67%).

Out of 19 patients 11 patients improved, follow up was done with uro-flowmetry and there was improvement in PFR and AFR and decrease in residual volume.

8 patients do not improve PFR and AFR remained same or decreases with time and one patient after 4 week undergo retention, 5 patients of which not improved undergo surgery later on. But other 3 patients refuse for surgery and accepted their quality of life as such. Overall Improvement was seen in 14 patients (46.67%)

Side effects of medicines

Present: 5 (16.67%)Absent: 25 (83.33%).

In this study 5 patients out of 30 experienced mild side effects which controlled with advise to take tablet at night before sleeping and with addition of antacids and all 5 patients improved.

In this study six patients in which alpha blockers was started were hypertensive, so dose adjustments with other antihypertensive drugs done to achieve both goals i.e. control of symptoms of LUTS and blood pressure. As tablet finasteride 5 mg OD is added only when size >40 gm, its effect comes slowly and very late and cause decrease in size off prostate if epithelial part is more hyper plastic.

DISCUSSION

Prostate gland growth occurs significantly during fetal development and puberty. After puberty, prostate gland size remains constant. Guess suggested that there is a progressive increase in BPH with increase in age i.e. 26% in men 41-50 years and 9% in men 71-80 years old. G1yn reported an incidence of 78% for benign prostatic hyperplasia in men by the age of 80 years. T

In this study, most common symptom associated with BPH was frequency of micturition in 93.33% patients and nocturia was the second most common associated symptom in 90% as compared to the study by Pinnock et a1. Poor urinary flow and hesitancy were the commoner obstructive symptoms while increased frequency and nocturia were complained by many among the commoner irritative symptoms. ¹⁸

In this study <30 gm of prostatic tissue was removed in 23 cases (76.67%) of TURP whereas in Freyer's prostatectomy it was found in 14 cases (46.67%) only. Transurethral resection of the prostate has been declared as the reference or standard treatment for the prostates less than 70 to 80 grams. $^{3-5,19}$

In this study blood transfusion was required in 86.67% patients operated by open surgery whereas when patients were operated by TURP, blood transfusion was required in 36.67% cases only and haematuria persists for more than 2 days and lasted up to 5 day in Freyer's prostatectomy group in 40% cases whereas it lasted for less than 2 days in 93.33% cases operated by TURP, as compared to study by Lynch M et al. there were only 4% of cases had post-operative bleeding in TURP and the study of Oranusi CK et al. there were 18% of cases had post-operative bleeding in Freyer's prostatectomy. ²⁰⁻²¹

Parameter	Freyer's prostatectomy	TURP
Complete removal of prostate gland	Yes	No
Special endoscopic instruments and experience required	No	Yes
Incision over abdomen	Yes	No
Haematuria duration	2-5 days	Less than 2 days
Blood loss requiring blood transfusion	More likely	Less Likely
Length of hospital stay	More as compared to TURP	Less as compared to open prostatectomy
Larger gland removal	Easy	Difficult
Associated bladder pathologies treatment	Easy and done simultaneously	Not possible

Table 12: Advantages-disadvantages.

In this study most common post-operative complication was temporary Incontinence of urine in 20% cases of Freyer's prostatectomy (group I) and in 10% cases in TURP (group II). None of the patient in this Study developed permanent incontinence. In this study wound infection occur in 10% cases of Freyer's prostatectomy patients, as compared to study by Nanninga and O'Connor, 4% of patients undergoing prostatectomy developed wound infection it was reported that the reason for a high wound infection rate was a high incidence (20-50%) of acute urinary retention in patients undergoing prostatic surgery requiring pre-operative Foley's catheterization. Other complications like urinary incontinence and urethral stricture and erectile dysfunction are in the range of 2-3%.²² There was no mortality in present study whereas study by Melchier reported a 1.3% mortality rate for prostatectomy.²³

The mean durations of postoperative catheterization and hospital stay following either transurethral resection or open prostatectomy corroborate data from previous studies. 8,24-28

Medical management also has promising results it can be given to patients who wish to avoid surgery or are high risk patients for surgery. It may be a bridging option for those who are waiting for surgery. Alpha blocker also has dual therapeutic benefit when hypertention is associated. But up to 50% patient which do improve or develop retention with medical management, later undergo surgery, so it increases cost of management in those patients. Medical management has its own side effects like postural hypotension, giddiness, retrograde ejaculation, gastritis etc. Androgen blockers, achieve its effect after long time i.e. need to take at least for 6 months. ¹⁵

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