Review Article

MONOPOLAR TRANSURETHRAL RESECTION OF THE PROSTATE FOR BENIGN PROSTATIC HYPERPLASIA: WHAT ARE THE OUTCOMES AND COMPLICATIONS IN OUR PATIENTS?

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ABSTRACT

BACKGROUND: Transurethral resection of the prostate (TURP) is the current gold standard for the operative management of symptomatic Benign prostatic hyperplasia (BPH) and has excellent long term efficacy. Currently there is a gradual shift towards bipolar TURP and Holmium enucleation of the prostate (HoLEP) due to fear of complications, particularly transurethral resection (TUR) syndrome associated with monopolar TURP. However, bipolar generator and high powered holmium laser resectoscpe remain very expensive and make the bipolar TURP/HoLEP out of reach for majority of our patients.This study seeks to review our experience with monopolar TURP with a view to appraising its outcomes and complications seen in our patients.

PATIENTS AND METHODS: Records of 42 patients, who underwent monopolar TURP for BPH between October, 2013 and September, 2016 were reviewed retrospectively. The data of patients who had undergone monopolar TURP, following standardized technique, were retrieved and subjected to statistical analysis.

RESULTS: The mean age of the 42 patients was 67.07±9.38 (range 51 – 86).Those in the age range 60-69 years had most of the procedure.The mean prostate volume was 70±23.74 (ml); the mean prostate specific antigen (PSA) was 5.32±5.4ng/ml. All the patients had spinal anaesthesia.The mean intraoperative time was 71.05±19.07 (mins), while the mean hospital stay for the patients was 61.14±27.13 (hrs).The mean volume of 5% dextrose-water used for irrigation at surgery was 30L. Most of the patients, 33(78.6%) had their catheters removed at 3-5 postoperative days. Only, 9(21.4%) had catheter for more than 5 days.The mean weight of resected prostatic chips was 29±9.2g. Intraoperatively, 1(2.4%) patient had bleeding that needed blood transfusion, 6(14.3%) had capsular perforations while none of our patients had TUR syndrome. Postoperatively, 3(7.2%) patients had clot retention while 2(4.8%) had UTI and 32(76%) had retrograde ejaculation. All patients except 1(2.4%) had satisfactory voiding at removal of catheter and subsequent follow up visits.

CONCLUSION: Improved antibiotics, perioperative care and instrumentation have greatly improved the morbidity of modern monopolar TURP and make it still useful for our patients.

KEY WORDS: TURP, BPH, Prostatectomy

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INTRODUCTION

Benign prostatic hyperplasia (BPH) is a progressive disease that leads to lower urinary tract symptoms (LUTS) with attendant decrease in the quality of life in men. It is the commonest complain among ageing male population in the urology clinic[1]. Transurethral resection of the prostate (TURP) is the current gold standard for operative management of symptomatic BPH and has excellent long term efficacy[2].

Monopolar TURP has been available for over ten decades globally. Currently there is a gradual shift towards bipolar TURP and Holmium enucleation of the prostate (HoLEP) due to fear of complications, particularly TUR syndrome associated with the monopolar TURP. However, bipolar generator and high powered holmium laser resectoscpe remain very expensive and make the bipolar TURP / HoLEP out of reach to majority of our patients. There have been numerous technical improvements of TURP implemented over the past two decades, including video-assisted TURP, continuous flow instruments, special loop designs, and modification of high frequency generators, have evolved the monopolar TURP into a safer operation and makes it superior to many minimally invasive therapy options[3]. This study seeks to review our experience with monopolar TURP with a view to appraising its usefulness and

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complications seen in our patients.

PATIENTS AND METHODS

Records of 42 patients, who underwent monopolar TURP for BPH between October, 2013 and September, 2016 were reviewed retrospectively. Patients were thoroughly evaluated and had full blood count, serum electrolytes/urea/creatinine, chest X-ray, electrocardiogram (ECG) before surgery. Prostate biopsy was also carried out for patient with elevated prostate specific antigen (PSA).

Data on patients' demographics, indication for the surgery, prostate volume, PSA, operative time, volume of irrigation fluid used, intraoperative and postoperative complications, duration of surgery, duration of postoperative urethral catheterization and duration of hospital stay were obtained. Data was entered into and analysed using SPSS®version 22.

Surgical technique

The monopolar TURP was performed under spinal anaesthesia with patient in lithotomy position. Cystoscopy was first carried out to assess the size and configuration of the prostate and to rule out the presence of concomitant bladder pathologies such as stone, tumour and diverticulum. The surgery was performed using size 26Fr rotatable sheath, continuous flow resectoscope with active working element (Vega, Germany) and DRE ASG-300 electrosurgical unit set at 140w cutting and 70w coagulation. Irrigation was achieved with 5% dextrose-water in 1L bag hung at height of 60cm set above the patient's pubic symphysis. The patients' urethral meatus were routinely calibrated with Clutton dilator up to up to size 28Fr (one size larger than the resectoscope sheath) and adequate instillation of KY jelly lubricant to allow free passage of the resectoscope.

The median, lateral, anterior and apical prostatic tissues were resected to the prostatic capsule in accordance with the Mauermayer resection technique and the prostatic chips evacuated with Boston Scientific/Microvasive evacuator. A size 20Fr 3-way silicone urethral catheter was inserted after each procedure to allow continuous bladder irrigation with normal saline.

Intravenous antibiotics were given for 48hrs postoperative and subsequently oral antibiotics till catheter was removed as prophylaxis. Postoperative analgesia consisted mainly of oral paracetamol.

RESULTS

A total of 42 patients underwent the monopolar TURP for BPH during the period under review. The mean age of the patients was 67.07±9.38 (range 51 – 86). Those in the age range 60-69 years had most of the procedure. Some of the patients also presented with various co-morbities that were adequately controlled before surgery (table 1).

Table1: Comorbities as seen in the 42 patients who had monopolar TURP

Comorbities		
	Hypertension	10(23.8%)
	Diabetes mellitus	7(16.7%)
	Hypertension/Diabetes mellitus	2(4.8%)
No comorbities		23(54.8%)
Total number of patients		42 (100%)

The mean prostate volume was 70±23.74ml; the mean prostate specific antigen (PSA) was 5.32±5.4ng/ml. The indications for the surgery for the patients are as shown in table 2.

Table 2: Indications for the Monopolar TURP in the 42 patients

Persistent haematuria	3(7.3%)
Recurrent acute urinary retention	5(11.9%)
Chronic urinary retention	8(19.0%)
Severe LUTS	17(40.5%)
Failed medical treatment	9(21.4%)

All the patients had spinal anaesthesia. The mean intraoperative time was 71.05±19.07 (mins), while the mean hospital stay for the patients was 61.14±27.13 (hrs). The mean quantity of 5%dextrose-water used for irrigation at surgery was 30L. Most of the patients, 33(78.6%) had their catheters removed at 3-5 postoperative days. Only, 9(21.4%) had catheter for more than 5 days. The mean weight of the resected prostatic chips was 29±9.2g. Resected chips specimen from 2(4.8%) patients turned out to be adenonocarcinoma and the patients were referred for further treatment. The complications observed during the surgery and during follow up visits are shown in table 3. All patients except 1(2.4%) had satisfactory voiding removal of catheter and subsequent follow up visits.

Table3: Complications observed following monopolar TURP for the 42 patients:

Intraoperative complications		
	Bleeding obscuring vision for most part of the operation	2(4.8%)
	Perforation(bladder neck/capsule)	6(14.3%)
	Obturator reflex	3(7.2%)
	Broken loops	1(2.4%)
	TURP syndrome	0
Postoperative complications		
	Clot retention	3(7.2%)
	UTI	2(4.8%)
	Urinary retention	1(2.4%)
	Persistent LUTS/AUR(from incomplete resection necessitating redo TURP)	1(2.4%)
	Epididymorchitis	1(2.4%)
	Retrograde ejaculation	32(76%)
	Urethral stricture	0.0%

DISCUSSION

Bladder outlet obstruction secondary to BPH can result in significant complications including renal failure, urinary retention, recurrent urinary tract infection, bladder diverticulum; bladder and renal stone as well as haematuria. There has been a considerable interest in the past decade in the development of medical and minimally invasive therapies for BPH. Unfortunately, the outcome indicators for these therapies are not as reliable as that of TURP[4,5]. Patients who choose the medical and minimally invasive therapies do so because of the reduced adverse events. This trade off of risk for efficacy sometimes does not work in favour of the patient. In our study patients who had severe LUTS or developed complications due to BPH were those subjected to the monopolar TURP. The NICE (National Institute of Clinical Excellence) guidelines of 2010 for LUTS due to BPH[4] in men recommend TURP for severe LUTS or when conservative management options are not successful. Severe LUTS (40.5%) was the commonest reason for the monopolar TURP in our review while failed medical treatment (21.4%) was the second most common indication for the procedure in the review. European Urology Association (EUA) guidelines for BPH[6] also identify the bothersome LUTS refractory to medical treatment and severe LUTS as the common indications for TURP.

Transurethral resection of the prostate (TURP) due to its efficacy is the undisputed gold standard of therapy for patients with LUTS secondary to BPH[2,7]. The durability of the relief of BPH associated LUTS after TURP is unsurpassed.

With various technical improvements over the past decades TURP though not without complications is a safer and more acceptable surgery compared to open prostatectomy. Transurethral resection (TUR) syndrome one of the more feared and potentially fatal complications of monopolar TURP has decreased significantly during the last few decades from 3% to less than 1%[8,9,10]. Transurethral resection (TUR) syndrome occurs when significant hypotonic fluid used for irrigation during the monopolar TURP is absorbed leading to systemic manifestations[12]. It may be seen from as early as 15mins after resection starts of the procedure to up to 24hrs postoperatively[13]. In a series by Mebust[7] and colleagues the TUR syndrome occurred in 2.0%. Other authors have reported incidence of 2.8%[15, 16, 17, 18]. We did not observed TUR syndrome in our study. Similarly, Ali[19] and his colleagues in their large series review of 3589 monopolar TURP in Turkey did not observe this complication. Also, Jen Rassweiler [20]and colleagues in a met-analysis of monopolar TURP for two periods: early (1979-1994) and recent (2000-2005) found that the incidence of TUR syndrome was 1.1% vs. 0.0%. This reduction has been attributed to use of video assistance in TURP, continuous-flow resectoscope and improved surgical technique.

Retrograde ejaculation occurs in majority of patients following TURP. Many of our patients (76%) complained about retrograde ejaculation. A meta-analysis found retrograde ejaculation in 65.4% of patients[21]. Antegrade ejaculation could be preserved in younger patients if necessary by preserving the bladder neck at resection[22]. Our patients were counseled about this complication and those that developed the complication expressed concern.

Bleeding requiring blood transfusion is a major intraoperative complication during TURP. Only 1(2.4%) of our patients required blood transfusion due to intraoperative bleeding. This compares with finding by Mebust[14] and colleagues in their of 3885 TURP where the recorded transfusion rate of 2.5%. Horninger[23] and colleagues recorded a transfusion rate of 4.2%.

We used 5% dextrose water as irrigation fluid for all the procedures. This fluid is less commonly associated with TUR syndrome. Yousef[22] and colleagues in a randomized comparison between 5% dextrose-water,

1.5% glycine and0.9% saline concluded that using either normal 0.9% saline or 5% dextrose-water as irrigating solutions during TURP is associated with lower perioperative morbidity including TUR syndrome when compared to 1.5% glycine. Its minor drawback being that it causes stickiness of resectoscope and caramelization at the cutting loop diathermy during surgery. Glycine and 5% dextrose water have been in use for irrigation during TURP for more than 50years and 20years respectively. Collins[22] and colleagues randomized 233 patients to receive 5% dextrose water and 1.5% glycine in a prospective study. They found that the 5 patients of the 233 who developed TUR syndrome where in the glycine group and none of the patients in the dextrose group developed the syndrome. This study is instructive though they also stated that this difference did not reach statistical significance (Fisher's exact test, p= 0.06, n = 233). And they concluded that hyponatraemia, toxicity of glycine and / or its metabolites explains TUR syndrome and recommend that urologists should preferably use crystalloids, including 5% dextrose as alternative irrigant for TURP.

Urethral catheters placement after TURP facilitates bladder irrigation to prevent clot retention, reduce burning sensation and ease irritation of the prostatic fossa. Most of our patients (78.6%) had their catheters removed at 3-5 post-operative days. This conforms to the conventional duration postoperative catheter stay. Many authors have advocated earlier catheter removal particularly following TURP for smaller prostate volume[23,24,25].

We did not observe urethral stricture in any of our patient probably because of short follow up period. It's a major postoperative complication. The meta-anaysis by Rassweiller 17 and colleagues observed a complication rate of 2-9%. Urethral strictures following TURP are due to trauma from the resectoscope, as a consequence of current leak as a result of insufficient urethral isolation by the lubricant or due to catheter trauma. The strictures are usually formed at the urethral meatus and the bulbar urethra. They can be prevented by prior urethral dilatation or urethrotomy and adequate lubrication of the urethra prior to insertion of the resectoscope.

CONCLUSION:

Improved antibiotics, perioperative care and instrumentation have greatly improved the morbidity of modern monopolar TURP and make it still useful for our patients

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