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Comparative Study of Bipolar Turp With Monopolar Turp

Medical Science

KEYWORDS :

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ABSTRACT

Bipolar TURP is a newer modality for treatment of BPH. We conducted a retrospective study of BPH patients who underwent surgery in our institute from january 2011 to august 2013. Our study aims to compare flow rate and symptomatic improvement of Bipolar TURP with Monopolar TURP. 92 patients underwent TURP in our study. 55 monopolar and 37 patients, Bipolar TURP. Flow rate improvement with Bipolar TURP was comparable to monopolar TURP in our study.

INTRODUCTION

All aging men are affected by BPH, and is progressive in nature [1]. BPH-related obstruction (ie, benign prostatic obstruction [BPO]) [2] is associated with lower urinary tract symptoms (LUTS). The incidence of LUTS/BPO is high and increases linearly with age [3]. BPH is one of the most common condition managed by urologists. BPH significantly impacts quality of life (QoL) which justifies additional research into the use of therapeutic resources [4].

For 8 decades, transurethral resection of the prostate (TURP) has been standard surgical management for BPH. TURP has outstanding, well-documented, long-term treatment efficacy [5]. When resecting large prostatic glands, especially more than 60 g, there can be significant absorption of irrigation fluid, bleeding and dilutional hyponatremia.[2]

Bipolar TURP or Transurethral bipolar resection in saline (TURIS) is a newer development in the technique of TURP. It is fast spreading among the urologists due to minimal learning curve for those who are already practicing TURP. Surgical technique of Bipolar TURP is similar to classical TURP, with some differences in energy generator and instruments. In contrast Laser prostatectomy by HoLEP and PVP involve a learning curve of altogether different method. They require new specialized set of equipments.[9]

The aim of our study was to compare results of Bipolar TURP with standard Monopolar TURP in our institute.

MATERIALS AND METHODS

We conducted the study on patients who underwent TURP from january 2012 to december 2014, patients with BPO in our Department of Urology, Pariyaram medical college, Kerala. We did a retrospective collection of data from previous case files and recorded and did a comparative analysis of the data. Inclusion criteria included maximal urinary flow rate (Qmax) of less than 15 mL/s, age greater than 45 years, medication (5α-reductase inhibitors or α-blockers) failure, and International Prostate Symptom Score (IPSS) of greater than 12. Patients with known renal impairment, neurovesical dysfunction, bladder calculus, prostate carcinoma, a previous history of prostatic or urethral surgery and urethral stricture were excluded. Those patients in whom additional procedure or change of planned procedure was performed, was excluded from the study. Urodynamic investigation was not used routinely in our institute. Transrectal prostate biopsy was performed in patients upon suspicion of prostatic malignancy on digital rectal examination and/or elevated prostate-specific antigen (PSA) level.

Total of 92 patients underwent TURP during this period. Preoperative IPSS, Qmax, PSA level, postvoid residual urine (PVR) volume were noted. Perioperative outcome measures included the need for blood transfusion, operation time, resected tissue weight, intraoperative and postoperative irrigation and duration of catheterization were noted. Operative procedure performed was noted and perioperative complication including need for blood transfusion, TUR syndrome were noted. Patients who had changes in planned procedure was excluded. And postoperative outcome measures included Qmax, PSA level IPSS, postvoid residual urine (PVR) volume, at each follow-up visit. All perioperative and postoperative adverse events were noted, and all parameters were compared at baseline and at postoperative visit between the two study arms.

All patients received spinal anesthesia as well as perioperative administered intravenously. All procedures were performed by a single urologist with experience in TURP procedures. All patients were treated similarly, apart from the intervention. Conventional M-TURP was performed with a 24F resectoscope (Karl storz, Germany) and a loop electrode for TURP (5 mm diameter, karl storz), using an Martin generator set at 110 W (cutting mode) and 70 W (coagulation mode). Distilled water or glycine 1.5% was used as irrigation fluid. Bipolar resection was performed with a 24F resectoscope (Wolf, Germany) and a plasma-loop electrode (5 mm diameter, Gyrus Medical Ltd.), using a Martin Plasmakinetic generator set at 150 W (cutting mode) and 80 W (coagulation mode). All the prostatic chips were removed from the bladder at the end of the procedure. Subsequently, we inserted a 18F three-way Foley catheter into bladder and initiated irrigate the bladder with normal saline solution in the operating room. We measured the level of patients' serum sodium and hemoglobin postoperatively. Once the patient was able to drink an adequate amount of fiuid for auto-irrigation, saline irrigation was stopped. We removed the catheter, if the urine was clear, and the patient had passed stool.

The Plasmakinetic Generator generates strong, pulsatile, bipolar energy, which generates the working temperature on the cutting tool, permitting maximum tissue dissection with minimum collateral damage. In addition to allowing effective cutting, it has been constructed to achieve optimum hemostasis and prevent adherence to the tissue. Only a small proportion of the energy applied leads to tissue vaporization, which means that the tissue remains for histological analysis, as with monopolar TURP. One principal advantage of the bipolar instrument is that it is possible to use normal saline solution (NaCl 0.9%) as irrigating fluid. The absence of reverse current is intended to decrease the risk of burns and subsequent stricture formation.[8]

Patients with follow up of minimum 6 months were included in the study. The longest follow-up period included so far in the

evaluation is 2 years. Outpatient checkups were conducted 3, 6 and 12 and 24 months after surgery, including medical history, uroflowmetry, determination of residual urine volume, digital rectal examination. IPSS questionnaire were also obtained from patients.

Statistical Analysis

The data was analysed using epi info software version 7. The pre-operative parameters and the postoperative improvement were analysed using t test.

RESULTS

Ninety two patients were selected in the study, with patients in the 55 monopolar TURP group and 37 in the bipolar TURP group. At baseline, the two groups were comparable in age, International Prostate Symptom Score, and they had at least 6months of follow-up.

The mean age of patients was 66.6 years with standard deivation of 8.3years in monopolar and 67.5years with SD of 8.0 years in bipolar group. It was not significantly different (p = 0.6). Pre-operative IPSS for monopolar group was 24.2 with SD 2.1 and for bipolar group IPSS was 25.0 with SD of 2.3 which were similar (p = 0.06)

The mean pre op flow rate for monopolar group was 7.5 ml/s with SD of 1.6 and for bipolar group was 7.5ml/s with SD of 1.6ml/s (p = 0.9)

The symptom, flow rate and postvoid residual urine improved significantly in both the groups. The mean improvement in IPSS symptom score was by 12.7 points in monopolar group. Patients in bipolar group had a mean imporovement in IPSS score by 13.40. Flow rate improved by 10.8 ml/s in monopolar and 10.6ml/s in bipolar group. Post void residual urine also improved significantly. In monopolar group the mean improvement in residual urine was 70ml and bipolar group 59.45.

The IPSS and Qmax improvements were comparable between the two groups at 6months of follow-up.

Complications

In each arm, three patients were diagnosed with urinary tract infection (UTI), because these patients' urine cultures were positive. After the sensitive antibiotics were used for 3 to 6 days, these patients' irritative symptoms eased. After catheter removal, in the M-TURP arm, two patients were diagnosed with acute urine retention. Clot retention was observed in 1 patient in the monopolar-TURP group and in 2 patients in the M-TURP group (p=0.041). Hematuria occurred postoperatively in 4 patients in the M-TURP arm and in 2 patients in the PK-TURP group (p=0.679). Furthermore, due to postoperative hematuria, blood transfusion was necessary in 2 patients in the M-TURP arm (p=0.477). Bladder neck stricture occurred in 2 patients (7.3%) in the M-TURP group and in 1 patients (3.6%) in the PK-TURP group (p=0.373). In both arms, midterm complications were similar (Table 5). In each arm, 3 patients were diagnosed with urethral strictures. These patients were required dilatation in the office without internal urethrotomies.

	MONOPOLAR	BIPOLAR
No	55	37
Age (years)	66.6(51-85)	67.5 (51-81)
Improvement in IPSS	12.67	13.40
Improvement in flow rate ml/s	8.29	7.83
Imp in PVR	70	59.45

Table 1: Base line characteristics of study participants

	Mono polar (n=57)		Bipolar(n=37)		P value*
	Mean	SD	Mean	SD	
Age of participants (in years)	66.6	8.3	67.5	8.0	0.6
Pre op Flow rate	7.5	1.6	7.5	1.6	0.9
Pre OP IPSS	24.2	2.1	25.0	2.3	0.06
Pre OP PVR	80.5	60.3	79.2	60.5	0.9

*using t test

Table 2: post operation improvemen in various parameters

	Mono polar		Bipolar		P value*
	mean	SD	Mean	SD	
Improvement in flow rate	10.8	2.6	10.6	3.2	0.7
Improvement in IPSS	12.7	1.6	13.4	1.7	0.03
Improvement in PVR	70	50.8	60.8	58.1	0.4

*Using t test

DISCUSSION

Aging men suffer from lower urinary tract symptoms. BPH is the most common cause for LUTS.

Monopolar TURP is still the standard surgical approach in benign prostate syndrome. Monopolar TURP gives excellent results with regard to subjective and objective symptoms.[1] TURP was developed 8 decades back in 1920. The associated morbidity of TURP has been reported to be as high as 11.1%.[4] After five years, the retreatment rate range is 3 to 14.5%.[3] Different techniques were evaluated for decreaing the morbidity of monopolar TURP, including Laser, microwave therapy etc.

Bipolar TURP is another new technique which shows good efficacy for large sized glands.[38] Its appeal lies in its similarity to conventional TURP. [9] It reduces complications by decreasing dilutional hyponatremia and is safer to use in patients on pacemakers.[9] Many studies have reported lower complications including blood loss and fewer clot retention episodes.[10] Some studies show shorter catheterization time and hospital stay.[10]

Our study showed significant improvement in the symptoms, flow rate and post void residual urine in the patients who underwent bipolar TURP, similar to results with monopolar TURP.

In our study, mean improvement in IPSS symptom score was by 12.7 points in monopolar group and by 13.40 in bipolar group.

In a study by Engeler et al, compared the results of monopolar with bipolar TURP. The mean Q-max improved postoperatively in both groups by about 12 ml s^{-1}. [E] In our study flow rate improved by 10.8 ml/s in monopolar and 10.6ml/s in bipolar group. Our results show that TURP gives significant improvement in the flow rate and our results are comparable to previous study. Also bipolar TURP also improves flow rate equivalent to monopolar.

Post void residual urine also improved significantly. In monopolar group the mean improvement in residual urine was 70ml and bipolar group 59.45. In their study Engeler et al showed that the residual urine volume decreased by a mean of 170 ml in the bipolar group, and was 31 ml postoperatively. The corresponding values in the monopolar group were 173 and 17 ml.

The two major late complications of monopolar TURP are bladder neck strictures (0.3-9.2%) and urethral strictures (2.2-9.8%).3 However, the incidence of urethral strictures has not changed significantly over time, despite improvements in surgical techniques, lubricants, instruments, and electrical technology.3 Bipolar technology minimizes the risk of urethral strictures theo-

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retically. In the recent study of Michielsen and Coomans, they reported a low urethral stricture rate (1.5%) for bipolar TURP, comparable with monopolar TURP (2.4%).25 Higher incidences of urethral complications with bipolar systems have been suggested occasionally.6 In a prior study, Tefekli, et al.26 reported a 6.1% rate of postoperative urethral stricture that the authors suggested might be related to a higher ablative energy and larger resectoscope. Furthermore, longer procedures have also been proposed as a risk factor by Bhansali, et al.18 In the study of Autorino, et al., Long term follow up of our patients will give an insight into the rate of urethral stricture and bladder neck stenosis. Bipolar TURP addresses the main drawback of monopolar TURP (M-TURP) by allowing the procedure to be performed in a normal saline environment,[5]

The fact that bipolar shares durable in time with monopolar TURP, similar clinical efficacy with low long-term complication rates, which has already confirmed by previous review and meta-analysis.5,6,9-11 Several prior RCT studies12-15 have reported improvements in both flow rates and symptoms with minimal complications.

Studies already published have described advantages of bipolar resection with regard to the frequency of the TUR syndrome,[13] intraoperative absorption of fluid, risk of hemorrhage,[14] duration of postoperative indwelling catheter irrigation, duration of catheterization and duration of hospitalization.[15]

In summary, our findings confirmed that both bipolar and monopolar resection of the prostate are effective and safe surgical methods for the treatment of benign prostate syndrome. Bipolar resection did not emerge as a clear superior. Therefore Bipolar TURP is as effective as monopolar in terms of symptom improvement, flow rate and residual urine improvement. At present monopolar TURP continues to be the standard treatment for BPH.

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