

ORIGINAL ARTICLE

COMPARISON OF BIPOLAR AND MONOPOLAR CAUTRY USE IN TURP FOR TREATMENT OF ENLARGED PROSTATE

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Background: In recent years, bipolar Transurethral resection of prostate (TURP) has been increasingly being used by urologist instead of conventional monopolar TURP for the treatment of enlarge prostate. Bipolar TURP is considered to be more efficacious and has better clinical outcome in comparison with monopolar TURP. We compared both procedures to assess their clinical out-comes and efficacy by comparing their different parameters. **Methods:** This randomized control trial was conducted in the Institute of Kidney Diseases and Transplant Peshawar over 220 consecutive patients from Sep 2013 to Dec 2014. Patients were randomly divided in two groups. Maximum flow rate (Q max), duration of resection, weight of tissue resected, TUR syndrome, blood transfusion and duration of hospital stay and catheterization were compared in both groups. **Results:** There were 110 patients in both groups each. Post-operative Q max, duration of resection, weight of tissue resected, duration of hospital stay, duration of catheterization was statistically insignificant. While statistically significant difference was found only the duration of procedure. **Conclusion:** Bipolar and monopolar have the same clinical out-come and complication rates, yet the monopolar TURP requires significantly less operating time in comparison to bipolar TURP efficacy. Both procedures can be used for the treatment equally however if urologist want to save the time he should use monopolar TURP.

Keywords: Monopolar TURP; Bipolar TURP; Enlarge Prostate

J Ayub Med Coll Abbottabad 2016;28(4):758–61

INTRODUCTION

Benign enlargement of prostate is a common condition in middle and old age group people which not only affects daily activity but also cause sleeps disturbances at night. Moderate to severe symptoms occur in 13% of people at the age of 40–49 years while 28% people are affected at the age older than 70 years.¹ Several treatment modalities are available such as watchful waiting, medical therapy, phytotherapy, minimal invasive procedure and open surgical intervention.² However, TURP still has the better long term results and is more effective to relieve the lower urinary tract symptoms.³ Advances over the years in terms of technique and instrument has made TURP a very effective procedure in relieving the lower urinary tract symptoms but still there is a concerned about its complications like bleeding, electrolyte imbalance, TUR syndrome, urethral stricture. It cannot be adopted as a day case procedure which causes financial loss for patient as well as government.

Bipolar TURP allows resection in normal saline which is more physiological reduces the risk of TUR syndrome. Improved haemostasis resulting less bleeding and good intraoperative visualization. Some studies have shown shorter catheterization time and reduced hospital stay as compared it with standard monopolar therapy.⁴⁻⁶

Transurethral resection of prostate (TURP) is cornerstone of surgical treatment of benign

prostatic hyperplasia since 1920.² Owing to long term safety and efficacy, Monopolar (M-TURP) is considered gold standard for surgical management of BPH.^{7,8} Meanwhile the associated morbidity of M-TURP has well been reported as high as 11.1%, TUR syndrome found in 1.4% and blood transfusion rate of 2.9%.^{7,8}

Monopolar TURP is considered safe with a low associated mortality rate. High perioperative morbidity rates largely due to intraoperative and postoperative haemorrhage or perforation, however, have been reported. Moreover, TUR syndrome, caused by absorption of irrigation fluid, has been known to occur. The reported rates range from 0.18–10.9%, with Mebust and his colleagues reporting an incidence of 2% in conventional monopolar TURP.^{9,10} the risk of TUR syndrome increases with a larger prostate (>45 g) or longer resection time (>90 min). Recently, transurethral resection and vaporization with bipolar energy has been introduced as a technical modification of TURP.¹²⁻¹⁴ The biggest advantage of bipolar current in TURP is the use of saline for irrigation, which may reduce the morbidity associated with the absorption of fluid. Performing TURP with saline eliminates the risk of TUR syndrome, thereby enabling the removal of a large bulk of prostate tissue by resection or vaporization.

MATERIAL AND METHODS

After the approval from the Ethic Committee of the Institute, 220 patients were included in this

randomised control trial after taking an informed consent from them. These patients were divided in the two groups. Group A included those patients who underwent bipolar TURP with normal saline 0.9% while group B included those patients who underwent monopolar TURP with glycine 1.5%. In this study, we included all those patients who had symptomatic enlarged prostate based on IPSS randomly. Those patients with associated disease like bladder stone, urethral stricture, previous prostatic surgery, neurogenic bladder and any urological malignancy were excluded from the study.

Demographic data and the parameters for the study to compare between two procedures were entered in the predesigned pro forma. Patients Q max (Maximum flow rate) both preoperatively and post operatively measured in both groups by uroflowmetry. Prostate volume was measured by trans-abdominal ultrasound. Duration of resection, amount of tissue resection, postoperative blood transfusion requirement, duration of hospital stay and TUR syndrome.

Postoperatively patients were catheterized and bladder wash continued for 24 hours. On first postoperative day bladder wash was stopped and catheter removed in all of the cases. On 2nd postoperative day patients were discharged after having passed urine without any problem or significant haematuria. Post-operative Q max was measured at first follow up which we did at 10th post-operative day.

All data were entered in SPSS-17.0 software. The *p*-value less than 0.05 was considered as significant.

RESULTS

At the beginning of the study there were 220 patients equally divided in two groups but at the follow up 110 patients appeared in the bipolar group and 110 patients appeared in monopolar group. Mean age of the patient in bipolar group was 69.5 years±10.93SD while in monopolar group it was 69.1 years±11.72SD with statistically insignificant (*p*-value=0.7937). The prostate volume was 50.4 ml±26.34SD in bipolar group and 48.9 ml±18.6SD in monopolar group which was also insignificant in both the groups (*p*-value=0.6261). In the same way, pre-operative Q max in both groups showed no significant difference (*p*-value=0.2895) with a value of 8.3 ml/sec±4.9SD in bipolar and 9.1 ml/sec±6.2SD in monopolar. (Table-1)

The post-operative Q max improved in both groups in bipolar group it was 12.4 ml/sec±9.4SD and in monopolar it was 12ml/sec±9SD with no significant difference between them with *p*-value=0.7475. The duration of resection in bipolar

group was 50.3 minute±20.8SD while in monopolar group it was 41.8 minute±17.5SD with a significant *p*-value of 0.0012. The amount of resected tissue was 23.03 gm±14.6SD in bipolar and 20.63 gm±14.6SD in monopolar with no significant difference (*p*-value=0.1512). Hospital stay was 2.5 days±4SD and duration of catheterization was 1.5 days±3SD in bipolar group while in monopolar it was 2.3±3SD and 1.2 days±3SD and found insignificant (*p*-value=0.6752 and 0.3838) respectively. Only one patient in bipolar group received blood transfusion while none of the patients in monopolar group which was not significant statistically. None of the patients suffered from TUR syndrome in both groups. (Table-2)

In this study, none of the parameters in both procedures showed any statistically significant differences except duration of procedure in the favour of monopolar TURP.

Table-1: Baseline characteristic both the groups

Variables	Bipolar (n=110) Mean (SD)	Monopolar (n=110) Mean (SD)	<i>p</i> -value
Age (Years)	69.5 years±10.93	69.1 years±11.72	0.7937
Prostate Volume (ml)	50.4 ml±26.34	48.9 ml±18.6	0.6261
Q max (ml/sec) Pre-operative	8.3ml/sec ±4.9	9.1 ml/sec±6.2	0.2895

Table-2: Postoperative comparison of parameter in both the groups

Variables	Bipolar (n=110) Mean (SD)	Monopolar (n=110) Mean (SD)	<i>p</i> -value
Q max (ml/sec) Post-operative	12.4 ml/sec±9.4	12ml/sec±9	0.7475
Duration of Resection (Min)	50.3 minute±20.8	41.8 minute±17.5	0.0012
Amount of Tissue Resected (gm)	23.03 gm±14.6	20.63 gm±14.6	0.1512
Hospital Stay days)	2.5 days±4	2.3±3	0.6752
Duration of Catheterization (day)	1.5 days±3	1.2 days±3	0.4591

DISCUSSION

Despite great advancement in endourology TURP is still considered the gold standard procedure for the treatment of BPH.¹⁵ Many changes have been made to decrease its complications and make it more efficacious one of such changes is the use of bipolar TURP with normal saline which is more physiological with lesser complications specially to avoid TUR syndrome the most fearful complication of TURP.

In our study, Q-max improved in both procedures without any significant difference. Same result was found by Engeler DS *et al* in their study comparing two procedures.¹⁶ Duration of the resection was shorter in monopolar TURP than bipolar which was statistically significant, de Sio M

et al and Erturhan S *et al* found the same results.⁵ But the study by Y Chang-Jun *et al* showed no differences between two procedure in regard to its duration.¹⁷ The amount of tissue resected in both procedures was not significantly different from each other. Singh H *et al* compared both procedures they found the resected amount of tissue was the same statistically in both procedures.¹⁸

In our study, only one patient in bipolar group received transfusion post operatively due to significant bleeding with no statistically significant difference. A study by Michielsen D. *et al* showed that despite promising experimental results of better haemostasis and deeper coagulation depth, bipolar technology does not permit one to reduce the amount of blood loss when compared to conventional monopolar technology. This study was conducted on patients with oral anticoagulation therapy they found there was no significant difference in both groups regarding postoperative bleedings and requirement of postoperative transfusion.¹⁹

TUR syndrome is one the most fearful complication of TURP but a rare one. Fortunately, none of our patients in both groups suffered from such complication. Same result was found by Carlos E *et al*.²⁰

Our results also show that both duration of catheter use and hospital stay were insignificant in both the group ($p=0.6752$ and $p=0.3838$, respectively). Other studies with bipolar TURP have reported high rates of re-catheterization and that irrigative symptoms were more common in the bipolar group, probably as a result of oedema secondary to higher current with lower frequency exerted on the tissue.²¹

Some other Studies in this regard shows different results. The study by Y Chang-Jun *et al* showed that both duration of hospital stay and catheterization were significantly shorter in bipolar group¹⁷ while other studies showed no differences.^{22,23} Higher re-catheterization rates with the bipolar device were also described in a randomized study by Dunsmuir and colleagues.²⁴ Singh and his colleagues,¹⁸ however, reported that postoperative dysuria was less with bipolar TURP than with monopolar TURP.

CONCLUSIONS

Bipolar and monopolar have the same clinical outcome and complication rates, yet the monopolar TURP requires significantly less operating time in comparison to bipolar TURP.

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Received: 18 August, 2016

Revised: 6 October, 2016

Accepted: 26 November, 2016

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