# TRANS URETHRAL ELECTRIC VAPORISATION OF PROSTATE AS AN ALTERNATE TO TRANS URETHRAL RESECTION IN BENIGN PROSTATIC HYPERPLASIA

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**Background:** There is an impression that trans urethral electric vaporisation of prostate (TUEVP) is a relatively safe surgical procedure for obstructing benign prostates; however before considering it an alternative to Trans urethral resection (TURP) in our setting, we conducted this study to assess its safety, convenience and especially cost effectiveness in our practice. **Methods:** Fifty patients with signs of benign prostatic enlargement causing acute urinary retention were selected and divided into two equal groups A and B. Patients of group A underwent TURP while the group B patients had TUEVP. Postoperative follow up to assess the results of the surgeries, including noting the complication rate, began 24 hour after the catheter was removed, continuing during postoperative visits of the patient at 2 weeks, 3 months and finally 6 months. **Results:** For approximately same size prostate, the mean operation time was less for TUEVP as compared to the TURP. The mean volume of irrigating fluid used and the number of blood transfusions required was also less in the TUEVP patients. In addition, TURP patients were also noted to have slight postoperative hyponatraemia. Clot retention was more frequent in the TURP group than the TUEVP group. Urethral catheters were required for longer duration (mean duration 74.88 hrs vs 24hrs, p=0.0001) and so was the hospital stay (mean duration 6.25 days vs 4.4 days, p=0.0046) in the TURP group patients. Total mean cost of treatment was also higher in the patients undergoing TURP. Among the complications, only the peroperative blood transfusion rate was higher in the TURP patients as noted above. **Conclusions:** The TURP has slightly higher morbidity and is costlier than TUEVP but its results in terms of relieving outflow obstruction are significantly better than TUEVP. It is therefore concluded that TURP is a more effective procedure but TUEVP with lesser morbidity and cost, is more suitable for relatively lesser obstructions in our setting.

**Key Words:** Prostate, Prostatectomy, Diathermy

## INTRODUCTION

Enlargement of prostate produces symptoms mostly after 50 years of age; nearly 70% of 70-year-old men have benign prostatic hyperplasia. [1] However only 29% of men eventually require surgery for the condition.[2]

Among the surgical treatments for the disease, Trans Urethral Resection of the Prostate (TURP) has a definite edge over open procedures and has become a reference standard for prostate surgery. However because of the high risk to elderly patients undergoing prostate surgery, the search for a procedure with minimal associated risks has continued. Therefore different procedures have been tried individually or in combination.

Laser ablation of the prostate is technically simple, has insignificant blood loss[3] and the hospital stay is also considerably shortened. The results are however not very impressive and the equipment involved is very expensive. Transurethral bladder neck incision of prostate is a relatively quick procedure and has a low morbidity but is only effective in small prostates and tight bladder necks.[4] A relatively new technique, the Trans Urethral Needle Ablation (TUNA) has been noted to produce better symptomatic relief when compared with Lasers.[5] It is associated with minimal morbidity and no serious complications.[6] However no long term trials have been conducted to popularise this technique. Trans Urethral Microwave Thermotherapy (TUMT) has produced some subjective response but no convincing objective improvement in patients' condition.[7] Infrequently used technique of Trans Urethral Balloon Dilatation of the prostate also has insignificant blood loss, shorter hospital stay and in addition less risk of retrograde ejaculation. The results of this procedure are however not good in relatively larger glands when compared to TURP.

Trans Urethral Electrovapourization of the Prostate (TUEVP) has drawn a great attention over the recent years as being one of the procedures with relatively low morbidity and effective results in managing enlarged benign

prostates.[8-18.] We, in our setting have to look at the results of procedures and management according to our perspectives because of the great differences of practice that exist between ours and other regions of the world (especially the developed nations).

Non surgical / conservative management for bladder outflow obstruction mainly due to obstructive prostate includes the use of selective alpha adrenergic blockers and alpha one reductase inhibitors. They have a significant role, but only in managing patients who are either waiting for surgery or are not undergoing it for some reason.

The above discussion clearly shows that there is room for improvement in the management of obstructive prostate, especially in the surgical treatment and therefore the quest for best surgical procedure continues. We in Pakistan have to look at the available means of treatment in our settings, bearing in mind the disease presentation in our patients, the available facilities here and specially the cost effectiveness. It was therefore sensible to try the relatively new attractive modality of TUEVP and compare it with the well-established TURP in our settings.

## MATERIAL AND METHODS

The study was conducted at Department of Urology, Services Hospital Lahore Pakistan over a period of two years (1996-1998).

A total of fifty patients, suffering from bladder outflow obstruction symptoms due to benign prostatic hyperplasia were selected for the study. They were divided into two groups of twenty five patients each. One group (A) underwent TURP while the other group (B) underwent TUEVP.

Patients with bleeding disorders, diabetes mellitus, cardiac failure, neurological disorders, renal function impairment, liver disorders, vesical calculi, urethral strictures, carcinoma prostate or prostate larger than 50 gm were excluded from the study.

A detailed history was taken and thorough examination performed. This provided necessary information about patients' symptoms and their condition. All patients had urine complete investigations and if signs of infection were there then urine cultures were also performed. Full blood count, electrolytes, creatinine, urea, sugar, clotting time, bleeding time, ultrasonography, Plain X-Ray, K.U.B, E.C.G and postoperative sodium were carried out.

Spinal or epidural anaesthesia was used. Preoperatively at the time of induction, prophylactic antibiotic was administered. During the TURP, the standard technique was followed using 24Fr size Resectoscope with cutting loop and 30 degrees telescope.

While performing TUEVP, 24Fr Resectoscope was used with the cutting mode of diathermy set on 400 Watts. The vaporisation was performed till the prostatic capsule, between 10 0'clock and 2 0'clock, from the bladder neck till the veru montanum. Tissue around 12 '0'clock was only vaporised when obviously obstructed.

5% Dextrose water was used for irrigation purpose. Per operatively, pulse and B.P record was made after every 15 minutes. Development of any other symptoms during the surgery was also noted.

22Fr three-way Foley' s urethral catheter was inserted after surgery.

0.9% saline was used for postoperative bladder irrigation. In group A, the urethral catheter was removed after 72 hours, while group B had their catheters removed after 24 hours.

Twenty four hours after the removal of the catheter, symptom scoring was performed and note made of any complication, if present in this period. At this stage the patients were discharged with instructions to visit the department at 2 weeks, 3 months and finally 6 months. Symptom scoring ( International Prostatic Symptom Score / I-PSS ), Post micturating residual volume, Uroflowmetry, Urine examination and bacterial count and assessment for late complications were done on these visits. Urethrogram was performed if indicated to exclude iatrogenic urethral strictures.

Comparison of the two modalities was performed as regards their safety, efficacy and cost effectiveness.

## RESULTS

Preoperative data are given in table-1, while peroperative data are given in table- 2. Postoperative data are given in Table-3.

Data for early complications are given in Table 4. Late postoperative complications are shown in Table 5. Data for Postoperative Symptom Score are shown in Table 6.

Data for post micturation residual urine volume are shown in Table 7. Data for Peak Flow Rate are given in Table 8.

**Table 1: Preoperative data for both groups.**

| Variables | Group A (TURP) | Group B (TUEVP) |
|---|---|---|

| | | |
|---|---|---|
| Mean Age (years) | 67.2 ± 7.47 | 64.14 ± 7.86 |
| Prostate Mean Weight (gm) | 38.6 ± 11.77 | 37.6 ± 11.10 |
| Preop Serum Sodium (mEq/l) | 139.16 ± 3.29 | 138.8 ± 3.48 |

*No difference was significant*

**Table 2: Operative data for both groups.**

| Variables | Group A | Group B | P value |
|---|---|---|---|
| Operating time (mins) | 35.8 ± 17.12 | 20.6 ± 9.5 | 0.0046 |
| Irrigant volume (litres) | 11.72 ± 5.21 | 8.28 ± 3.23 | 0.007 |
| Blood transfusion (no. of pts.) | 6 (24 %) | 1 (4 %) | 0.033 |
| Weight of resected prostate (gms) | 13.76 ± 1.9 | No tissue | - |

**Table 3: Postoperative data for both groups**

| Variables | Group A | Group B | P value |
|---|---|---|---|
| Irrigant volume (litres) | 27.04 ± 9.75 | 11.12 ± 2.46 | 0.008 |
| Duration of irrigation (hours) | 26.4 ± 6.56 | 9.84 ± 2.84 | 0.0001 |
| Postop. serum sodium (mEq/l) | 133.8 ± 3.81 | 142.46 ± 3.64 | 0.0001 |
| Duration of catheter (hours) | 74.88 ± 19.98 | 24 ± 0.00 | 0.0001 |
| Hospital stay (days) | 6.25 ± 1.23 | 4.4 ± 0.91 | 0.0046 |
| Cost of operation (Rs.) | 5584 ± 1000 | 4160 ± 732 | 0.0001 |

**Table 4: Early complications for both groups**

| Variables | Group A | Group B | P value |
|---|---|---|---|
| Clot retention | 3 (12%) | 1 (4%) | 0.001 |
| Haemorrhage | 4 (16%) | 0 (0%) | 0.08 |
| TURS | 1 (4%) | 0 (0%) | 0.31 |
| Fever | 2 (8%) | 1 (4%) | 0.55 |
| Retention of urine after catheter removal | 1 (4%) | 0 (0%) | 0.31 |

**Table 5: Late postoperative complications in both groups**

| Variables | Group A | Group B | P value |
|---|---|---|---|
| Secondary haemorrhage | 2 (8%) | 1 (4%) | 0.55 |
| Epididymo-orchitis | 2 (8%) | 1 (4%) | 0.55 |
| UTI | 8 (32%) | 3 (12%) | 0.22 |
| Retrograde ejaculation | 10 (40%) | 6 (24%) | 0.22 |
| Stricture urethra | 1 (45) | 1 (4%) | N.S. |

**Table 6: Postoperative symptom score for both groups**

| Variables | Group A | Group B | P value |
|---|---|---|---|
| Second week | 11.04 ± 2.48 | 12.76 ± 2.20 | 0.008 |
| Third month | 6.04 ± 2.42 | 8.72 ± 2.23 | 0.0001 |
| Sixth month | 3.36 ± 1.85 | 5.36 ± 1.85 | 0.0002 |

**Table 7: Post micturating residual volume in both groups**

| Variables | Group A | Group B | P value |
|---|---|---|---|
| Second week | 39.2 ± 14.35 | 48.68 ± 13.07 | 0.0456 |
| Third month | 26.4 ± 16.04 | 35.2 ± 21.24 | 0.091 |
| Sixth month | 11.48 ± 2.18 | 28.4 ± 19.56 | 0.003 |

**Table 8: Mean peak flow rate for both groups**

| Variables | Group A | Group B | P value |
|---|---|---|---|
| Second week | 14.48 ± 2.18 | 13.4 ± 4.0 | 0.23 |
| Third month | 15.6 ± 1.70 | 14.44 ± 3.31 | 0.114 |
| Sixth month | 15.88 ± 3.02 | 13.84 ± 1.75 | 0.0028 |

## DISCUSSION

In a relatively recent long term follow up comparison between TUEVP and TURP, TUEVP has been noted to produce comparable effective results in managing moderate sized benign prostatic hyperplasia.[17] However, in our study, which compared most of the aspects between TUEVP and TURP over a six-month period, most importantly from our patient-care point of view, significant differences were noted between the two groups in operating time, irrigant volume used preoperatively, postoperative blood transfusion, postoperative serum sodium, postoperative irrigant volume, duration of irrigation, period of catheterization, clot retention, hospital stay, cost of treatment, postoperative symptom score, postoperative post micturition residual urine volume and postoperative peak flow rate.

With the exception of a few, all other indices favoured TUEVP against TURP. This would indicate decreased morbidity and lower cost of treatment with the use of TUEVP as compared to TURP, which is very relevant to our practice.

The operating time of TUEVP was shorter in our study similar to another study[9] while others [16,19-21] have found that TUEVP takes longer than TURP. It appears that this variation in results might be operator skill dependent.

Like some others[22] per operative blood loss and requirement of blood transfusion was lower in our TUEVP group. This lower morbidity as said above is especially an important factor in our settings.

Our study also showed that dilutional hyponatraemia, which is an important feature of TURS, was not noted in our TUEVP cases unlike in the TURP patients, one of whom developed significant hyponatraemia with signs of TURS. The later situation arose because of prolonged resection time and bleeding. In TUEVP such occurrence is rare. The reported incidence of TURS in TUEVP patients in other studies is also low.[10,16,23]

Contrary to the findings of hyponatraemia in the TURP patients, our TUEVP cases showed there was a mean increase of 3.66 mEq/l serum sodium in the post operative patients. This increase can possibly be explained on basis of metabolic response to trauma triggered by the surgery and the concomitant administration of the I.V. normal saline by our anaesthetic staff.

The length of urethral catheter in our TUEVP patients was considerably shorter as compared to TURP cases as also confirmed by others.[12,16] This made the hospital stay shorter as well and lessen the chances of catheter related complications. Patients having their catheters removed early have unrestricted early mobility, which certainly has a definite edge.

The TURP group also had a higher occurrence of clot retention although postoperative haemorrhage was not significantly different from the TUEVP group.

The mean estimated cost of patients under going vaporisation was about Rs 1500 cheaper as compared to TURP cases. This difference was because of the shorter hospital stay, lesser amount of irrigating fluid use and the rare occurrence of serious bleeding requiring blood transfusions.

Post operative symptom score was slightly higher, flow rate was slower and post void residue more in our TUEVP patients than the TURP group as compared to most other studies.[9,10,17,18,24] This difference of results can possibly be due to our relative inexperience with the vaporisation technique. However, some others[14-16] have also noted peak flow rates in their TUEVP group lower than the TURP patients. Also as regards subjective interpretation of symptom score in our patients, one should bear in mind the high rate of illiteracy in our patients and thus view it more critically.

The occurrences of late post operative complications such as infection, retrograde ejaculation and stricture formation, in both our groups is similar as also noted in other studies.[9,10,16,17,24]

The lack of tissue in TUEVP is a known disadvantage. However, there is a study[8] describing 'Vapor-Cut' technique where combined vaporisation and resection seems to cut down on the disadvantages of vaporisation alone procedure by shortening the duration of vaporisation time and provides prostate tissue for histologic examination. This type of procedure also cuts down on the procedure time, produces better flow rates and subjective response. All this does indicate that 'Vapor-cut' may have an edge over TUEVP and TURP in future.

## CONCLUSIONS

We conclude that TUEVP does have a role in our settings, firstly because of its proven low morbidity rate, which is of great relevance in our practice as a large number of our patients are not very fit. Apart from being elderly, they come from low socio-economic backgrounds, hence are already higher surgical risks.

Secondly, the observation that TUEVP proves cheaper because of various factors is again specifically very important in our patient management, bearing in mind the high level of poverty in our patients.

The study however shows that when compared to others, we perhaps need to improve our patient selection with reference to prostate size as well as our surgical expertise in vaporisation skills in order to derive the maximum benefit out of this procedure. Once this is achieved, then the possibility of going for the combined procedure of vaporisation plus resection 'Vapor-Cut' may be seriously considered as the future technique of choice in our setting.

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