Early Clinical Outcome of Transurethral Resection of Prostate: Pre- and Postoperative Comparison of Symptoms, Flow Rates, Residual Volume and Quality of Life

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ABSTRACT

Background: Bladder outlet obstruction (BOO) in elderly male patients is frequently caused by benign prostatic hyperplasia (BPH) and the problem is increasing as the population is aging. Refined surgical methods are required to optimise clinical outcomes. Transurethral resection of prostate (TURP) has become the standard surgical treatment in BPH.

Objective: To assess the clinical outcome for TURP using pre- and postoperative comparison of symptom scores, flow rates, residual volume and quality of life.

Material & Methods: The study was conducted at Urology Unit LRH between January 2015 and December 2015. 65 patients with confirmed diagnosis of BPH were prospectively followed for three months after undergoing TURP. Their preoperative international prostate symptoms scores, flow rates, urinary residual volume and quality of life were assessed on initial clinical assessment. The same scores were assessed at the end of third month of follow-up.

Results: 65 patients were operated during the study period with a mean age of 64.89 years ± 6.65 SD, the overall outcome was favourable in 52 (80.0%) patients while it was unfavourable in the remaining 13 (20.0%) patients. About 47.7% of patients presented with a history of at least two-years duration. A Wilcoxon signed-rank test determined that there was a statistically significant median improvement of IPSS scores when patients were assessed at the end of follow-up period after undergoing TURP, $z = -7.015$, $p < 0.0005$.

Conclusions: Postoperative improvement in IPSS scores, postvoidal residual volume, peak flow rates and overall quality of life are significant factors associated with better patient satisfaction. However, surgical results need further improvement.

Keywords*: benign prostate hyperplasia, transurethral resection, TURP, outcome.*

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INTRODUCTION

Benign prostate hyperplasia (BPH) is one of the most commonly encountered urological disorder in the male population. With the increasing proportion of old age male population, it is obvious that lower urinary tract symptoms (LUTS) due to BPH will increase, requiring further resource allocation and improved medical and surgical management strategies in order to optimise outcomes[1-3].

After the novel alpha blockers, transurethral resection of prostate (TURP) is an effective surgical modality for the treatment of bladder outlet obstruction (BOO) due to BPH. TURP rate might have decreased over the last decade as suggested by some meta-analyses; it is still one of the most versatile and cost effective treatment methods for LUTS management due to symptomatic BPH once the conservative measures fail[3, 4].

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Several surgical outcome assessment tools have been introduced to enable comparability of results across centres. These include the international prostate symptoms score (IPSS)[5], the World Health Organizations quality of life index and comparison of several pre- and postoperative urinary flow parameters (Urine flow rate 'Qmax', and Postvoidal residual volume, PVR)[6, 7]. These parameters are standardised, objective and reliable for tracking the outcome of patients over time after undergoing TURP[8-10]. Good clinical outcome studies are warranted in order to present the current state of BPH management with endourological techniques in our centres and to improve further upon the current outcomes.

The aim of our study is to assess the early clinical outcome of BPH patients who undergo TURP in terms of improvement in symptoms, flow rates, postvoidal residual volume and overall quality of life. Additional emphasis is given to determine if age or symptoms duration are correlated to short-term outcome.

MATERIAL AND METHODS

This is a prospective observational study conducted at Urology Unit LRH between January 2015 and December 2015. Before commencement of the study, approval was

obtained from the hospital ethical committee. Informed consent was taken from all patients before inclusion in to the study. All questionnaires were filled by the patients, however, help was provided if there was difficulty comprehending/rating the questions.

Inclusion Criteria

All patients above the age of 50 years, diagnosed as confirmed cases of symptomatic BPH.

Patients with moderate to severe symptoms (IPSS >15).

Patients with moderate to severe reduction in urine flow rates (<15 mL/S).

Exclusion Criteria

Patients with lower IPSS scores and good flow rates (>15mL/s).

Patients well managed with medical therapy for BPH.

Procedures & Data Collection

Preoperatively complete clinical assessment was performed using focused history, physical and digital rectal examination, then the patients underwent ultrasonographic assessment for postvoidal residual volume, uroflowmetry, urodynamics, quality of life assessment and symptomatology assessment with the IPSS questionnaire. Serum PSA levels, renal function tests, urine microscopy and other relevant investigations were conducted for all patients before surgery.

Postoperatively patients were followed-up for three months. The final outcome scores for IPSS, flow rates, residual volumes and quality of life were assessed at the third month follow-up.

All procedures were performed under spinal anaesthesia with the use of 1.2% Glycine solution for irrigation. A 22 or 24 French rigid endoscope was used for resection. Postoperative three-way Foley's catheter was used for continuous irrigation for at least initial 4 hours.

Final outcome was classified either as favourable or unfavourable, taking into consideration the above stated parameters. Unfavourable was defined as either the failure of the postoperative parameters to decrease by at least 50% of the preoperative values. For example, an IPSS of 20 was expected to decrease by at least 10 points or more at the third month of follow-up. Similarly, other parameters were classified and a final outcome label was given regarding favourable or unfavourable outcome.

Data Analysis

Data was imported and analysed in SPSS Statistics version 22.0. Normality of the data was assessed using the Shapiro-Wilk test ($p > 0.05$). All outcome parameters along with age and symptoms durations were presented in mean ± SD. A matched pair Kruskal-Wallis test was used for assessing significance of improvement for the said scores. P value of =0.05 was taken as the cut-off for statistical significance.

RESULTS

A total of 65 patients were operated during the study period with a mean age of 64.89 years ± 6.65 SD (range: 51-77). The average symptoms duration was 28.71 months ± 17.22 SD (range: 6-75).

Preoperative Scores

Mean preoperative IPSS was 22.74 ± 4.91 SD (range: 15-32), mean PVR was 143.08 mL ± 61.45 SD (range: 20-250), mean Qmax was 8.69 mL/s ± 2.72 SD (range: 4-15) and mean QoL was 4.75 ± 0.85 SD (range: 3-6).

Postoperative Scores

Mean postoperative IPSS was 7.95 ± 4.32 SD (range: 2-17), mean PVR was 33.45 mL ± 9.84 SD (range: 15-60), mean Qmax was 25.65 mL/s ± 7.69 SD and mean QoL was 1.55 ± 1.19 SD.

The overall outcome was favourable in 52 (80.0%) patients while it was unfavourable in the remaining 13 (20.0%) patients. About 47.7% of patients presented with a history of at least two-years duration. All patients had already received medical therapy for BPH symptoms. Detailed clinical parameters scores for favourable and unfavourable outcome are presented in **Table 1**.

On Spearman's rank correlational analysis, patient age was the most significant factor to affect postoperative IPSS score (Spearman's Rho: 0.43,

p<0.0001). Similarly, there was a strong negative correlation between symptoms duration and postop PVR (r^2: -0.33, p = 0.008) and postop Qmax improvement (r^2: -0.33, p = 0.008). Moreover, there was a strong negative correlation between preop IPSS and postop Qmax (r^2: -0.33, p = 0.007). These correlations show that age is positively correlated to IPSS (older age, high postop scores), while symptoms duration negatively affect postop improvement of residual volume (PVR) and flow rates (Qmax).

A Wilcoxon signed-rank test determined that there was a statistically significant median improvement of IPSS scores when patients were assessed at the end of follow-up period after undergoing TURP (z = -7.015, p <0.0005). Similarly, matched pair Wilcoxon signed-rank test comparison of pre- and postop scores for Qmax (z = 7.014, p<0.0005), PVR (z = -7.009, p<0.0005) and QoL (z = -6.94, p<0.0005) were significantly improved. (**Fig 1**)

Fig 1: Visual representation of quality of life (QoL) pre- & post-op comparison in Wilcoxon Signed Rank test

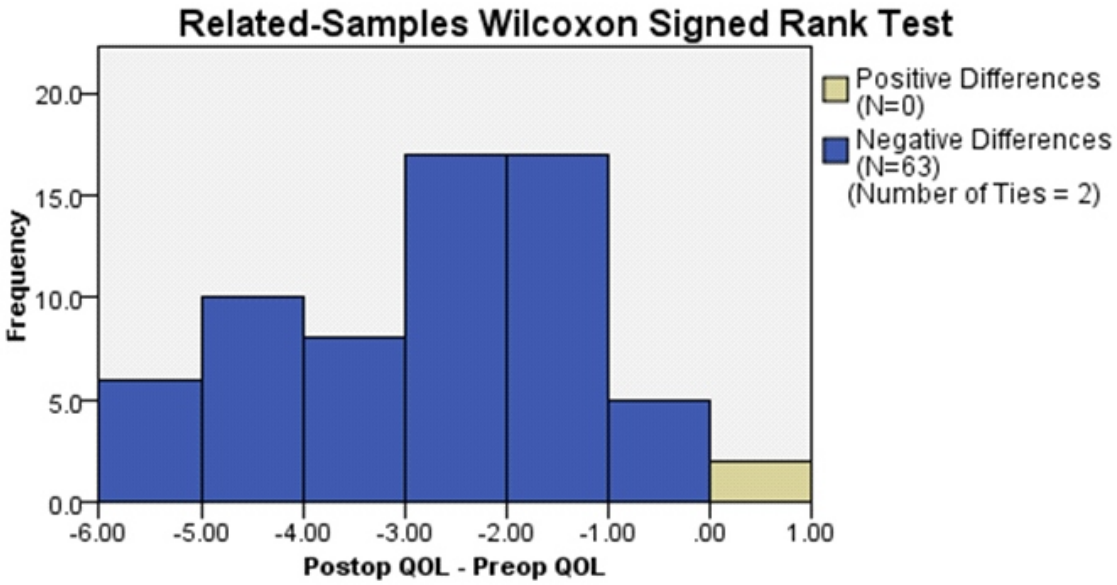


Table 1: Clinical parameter scores, pre- & postop, (mean ± SD) for outcome groups

Clinical features	Favourable outcome (n=52)	Unfavourable Outcome (n=13)
Age	64.58 years ± 6.82	66.15 years ± 6.01
Symptoms duration	30.02 months ± 17.4	23.46 months ± 16.03
Preop IPSS	22.62 ± 5.19	23.23 ± 3.77
Postop IPSS	7.48 ± 4.24	9.85 ± 4.29
Preop PVR	147.52 mL ± 60.76	125.31 mL ± 63.44
Postop PVR	33.87 mL ± 10.51	31.77 mL ± 6.62
PreopQmax	8.44 mL/s ± 2.62	9.69 mL/s ± 2.98
Postop Qmax	25.65 mL/s ± 7.55	25.62 mL/s ± 8.57
Preop QoL	4.75 ± 0.88	4.77 ± 0.73
Preop QoL	1.12 ± 0.85	3.31 ± 0.48

DISCUSSION

Transurethral resection of prostate (TURP) is a very cost-effective, quick and reliable endourological procedure which has shown promise of achieving optimal outcome in BPH patients presenting with symptomatic BOO.[11] These patients are mostly elderly male with concomitant comorbids and overall poor health status. Furthermore, BPH patients are usually incapacitated by their poor quality of life due to urinary symptomatology, poor rest and an augmented presentation of their comorbidities[12]. This is why TURP has proved beneficial in these fragile patients, owing to its minimal invasive nature and shorter operation times[13]. The optimal desired outcome for these patients is to improve urodynamics in these patients as well as symptomatology and overall quality of life[11, 14]. Improvement of a urodynamic feature and deterioration or poor improvement in symptoms and/or quality of life or vice versa is contrary to the idea of a good surgical outcome[15]. This is why urological surgeons have focussed particularly on improving urinary symptomatology in the form of IPSS scores, overall quality of life and other urodynamic parameters[12, 14].

Several locally & internationally published studies are available where the authors have compared morbidity or outcome after TURP in symptomatic BPH patients[10, 16, 17]. The patient demographics remain grossly the same across studies, where most patients present in their mid to late sixties and a prolonged history of urinary symptoms[1, 2]. In a study by SoleimaniM et al[18], morbidity was found to be higher in the group with comorbidities, especially diabetes mellitus. Similarly, they found that reoperation was required for about 25% of the comorbid group.[18] This study has highlighted important considerations for systemic comorbidities such as hypertension and diabetes where the surgical rates are significantly affected[18].

Nadeem A et al[19] in a quasi-experimental study of 120 patients obtained a postoperative Qmax of 17.5 mL/s at the third of follow-up. In another similar study by Jalbani MH et al[20], a mean Qmax of 27.5 mL/s was achieved at the end of three months of follow-up. These findings are concurrent with our study where a mean Qmax of 25 mL/s was achieved at the end of follow-up. Improvement in Qmax translates in achieving a good symptomatic control from hesitancy and is a desirable urologic parameter in BPH patient.[21] Good average peak Qmax is also necessary for achieving optimal bladder emptying in the absence of a bladder muscle dysfunction.[22]

Soleimani M et al[18] in a prospective analytical study has concluded that good overall quality of life (mean: 0.55-0.60, SD: 1.3) and lower IPSS scores (mean: 4.4-6.0, SD: 5.6) are achievable despite systemic comorbidities such as diabetes and hypertension.[18]These findings are consistent with our study where we have noted a good IPSS and overall QoL improvement after TURP. As pointed out by Masumori N et al[23], QoL improvement is one of the most significant factor to predict long-term improvement and once it improves after TURP, it can be predicted that patient satisfaction levels will remain high for a longer period of time.[23] Therefore, QoL improvement is one of the significant factors which needs to be tested while following patients after TURP for symptomatic BPH. Some studies[23] have discussed the importance of the presence of definite BOO before surgery as one of the factor which will predict postoperative outcome, however, a study by Oh MM et al[24] has shown that there is no correlation between equivocal BOO and good postoperative outcome in terms of Qmax and IPSS improvement.[24] These controversial findings warrant further research.

Attempts have been made by researchers to enable clinicians better predict short and long-term outcome after TURP. However, no single factor has been proven sufficient to predict outcome, rather, a combination of preoperative factors has been used in nomograms which can predict outcome after surgery with significant certainty. The American society of anaesthesiologists (ASA) grade, BOO, IPSS, Qmax, PVR, QoL, age and symptoms duration are a few which have been used to predict TURP outcome. In our study we found that older is related to postoperative symptoms scores (r^2: 0.43, $p<0.000$). Similarly, symptoms duration negatively affect outcome in terms of improvement in Qmax and PVR. These findings show that patient selection according to age and symptoms duration might be predictive of TURP outcome up to some extent, however, generalisation cannot be made due to the smaller sample size of the study population.

The unfavourable outcome of 20% in our study, though lower than most local[18, 19, 20] and some international studies[16, 25], points out the fact that the preoperative predictors need to be taken in to consideration before contemplating on surgical exploration for these fragile patients. Another way to improve outcomes might be lying in developing newer, safer and effective techniques, such as those already underway, e.g., transurethral vaporisation of prostate and microwave thermotherapy.[19]

To summarise our findings, it can be stated that TURP though an effective procedure, still bear risks of failure of treatment with poor quality of life in a significant proportion of patients. Further randomised clinical outcome studies are advised in order to be able to better assess and compare outcomes after TURP.

CONCLUSION

Transurethral resection of prostate significantly improves outcome in patients with bladder outlet obstruction due to benign prostate hyperplasia. Postoperative improvement in IPSS scores, postvoidal residual volume, peak flow rates and overall quality of life are significant factors associated with better patient satisfaction. However, a significant portion of these patients does not achieve the desired surgical outcome which needs further improvement.

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