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PREOPERATIVE AND POSTOPERATIVE URODYNAMICS IN PATIENTS OF BENIGN PROSTATIC HYPERPLASIA (TRANSURETHRAL RESECTION OF PROSTATE VS. OPEN PROSTATECTOMY)

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ABSTRACT: A comparative study was conducted in the Department of Surgery, Government Medical College, Jammu, from December, 2010 to November, 2011 for a period of one year. Aim of the study was to see the effects of surgeries of benign prostatic hyperplasia (TURP and open prostatectomy) on the urodynamic parameters and to statistically analyze and compare the urodynamic outcome of two surgeries. Patients selected for study were those undergoing either transurethral resection of prostate (TURP) or open prostatectomy for benign prostatic hyperplasia (BPH), whereas those excluded from the study were patients with nervous system disorders, unstable/overactive bladder, obstructive symptoms due to causes other than BPH and those who were not fit for general anaesthesia. Forty patients with prostate >50 grams, who fulfilled the inclusion criteria, were randomly and equally selected to undergo either transurethral resection of prostate (TURP) or open prostatectomy. Preoperative urodynamic study of the patients was done. Repeat urodynamic study of the patients was done at 3 weeks and 3 months after surgery. Then the differences in the preoperative and postoperative urodynamics were evaluated in two groups of patients. The mean maximum flow rate (in ml/sec) was more in TURP group at 3 weeks postoperatively but the difference was statistically non-significant. However, it was more in open prostatectomy group at 3 months postoperatively and the difference was statistically significant ($p = 0.01$). The mean average flow rate (in ml/sec) was more in TURP group at 3 weeks postoperatively but the difference was statistically non-significant. However, it was more in open prostatectomy group at 3 months postoperatively and the difference was statistically significant ($p = 0.008$). The mean maximum detrusor pressure (in cm H₂O) was more in open prostatectomy group at 3 weeks postoperatively but the difference was statistically non-significant. However, it was more in TURP group at 3 months postoperatively and the difference was statistically significant ($p = 0.0001$). Open prostatectomy is an acceptable operation for the prostate size >50 grams. Higher peak flow rate improvement, average flow rate improvement and less detrusor pressure was evident in patients treated with open prostatectomy group. Open prostatectomy is a better procedure than transurethral resection of prostate as per as the urodynamic outcome is taken into consideration.

KEYWORDS: BHP, Open prostatectomy, Urodynamics.

INTRODUCTION: Benign prostatic hyperplasia (BPH) is one of the most common diseases among old men. It is defined histologically as a disease process characterised by stromal and epithelial cell hyperplasia beginning in the periurethral transitional zone of the prostate.¹ All benign prostatic hyperplasia nodules develop either in the transition zone or in the periurethral region.² Symptoms of prostatic obstruction are age-related. At age 55 years, approximately 25% of men report obstructive

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voiding symptoms. At age 75 years, 50% of men complain of a decrease in the force and caliber of their urinary stream.³

The symptoms of benign prostatic hyperplasia can be divided into obstructive and irritative complaints. Obstructive symptoms include hesitancy, decreased force and caliber of stream, sensation of incomplete bladder emptying, double voiding (Urinating a second time within two hours of the previous void), straining to urinate and post-void dribbling. Irritative symptoms include urgency, frequency and nocturia. The evaluation of patients with benign prostatic hyperplasia includes detailed medical history focusing on the urinary tract, previous surgical procedures and general health issues. A digital rectal examination and a focused neurologic examination must be done.

Renal function tests and urine analysis (Routine examination and culture and sensitivity) should be done. Proper urodynamic evaluation should be done which includes uroflowmetry, cystometrography and urethral pressure profile studies. Absolute indications for surgery include refractory urinary retention (Failing at least one attempt at catheter removal), recurrent urinary tract infection, recurrent gross hematuria, bladder stones, renal insufficiency or large bladder diverticula⁴.

Urodynamic study is an important part of evaluation of patients with voiding and storage dysfunction. Urodynamic study of the lower urinary tract can provide useful clinical information about the function of urinary bladder, the sphincteric mechanism and the voiding pattern itself. It includes the following parameters⁵.

AIMS AND OBJECTIVES: To study the effects of surgeries of benign prostatic hyperplasia (TURP and open prostatectomy) on the urodynamic parameters and to statistically analyze and compare the urodynamic outcome of two surgeries.

METHODS AND MATERIAL: Patients eligible for inclusion in the present study were those undergoing either transurethral resection of prostate (TURP) or open prostatectomy for benign prostatic hyperplasia (BPH). Patients excluded from the study were those with nervous system disorders, with unstable/overactive bladder, with obstructive symptoms because of causes other than BPH and those who were not fit for general anaesthesia. Forty patients with prostate >50 grams, who fulfilled the inclusion criteria, were randomly and equally selected to undergo either transurethral resection of prostate (TURP) or open prostatectomy.

Preoperative urodynamic study of the patients was done. Repeat urodynamic study of the patients was done at 3 weeks and 3 months after surgery. Then the differences in the preoperative and postoperative urodynamics were evaluated in two groups of patients. The results of the two groups were analyzed and compared with each other. We included 40 patients of benign prostatic hyperplasia who underwent surgery for it. Twenty of them underwent open prostatectomy and 20 underwent transurethral resection of prostate. Preoperative urodynamic study was done in all the 40 patients. Postoperative urodynamic studies were done at 3 weeks and 3 months. The two groups were studied as per the outcome of the surgeries with respect to the urodynamics.

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RESULTS:

Figure 1: Line chart showing mean maximum flow rate (ml/sec) preoperatively, 3 weeks postoperatively and 3 months postoperatively in TURP and open prostatectomy groups.

Fig. 1

Figure 2: Line chart showing mean average flow rate (ml/sec) preoperatively, 3 weeks postoperatively and 3 months postoperatively in TURP and open prostatectomy groups.

Fig. 2

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Figure 3: Line chart showing maximum detrusor pressure (cm H₂O) preoperatively, 3 weeks postoperative and 3 months postoperative in TURP and open prostatectomy groups.

Fig. 3

DISCUSSION: In our study, the mean maximum urinary flow rate increased from preoperative value of 5.26 ± 1.25 ml/sec to 32.72 ± 7.19 ml/sec at 3 weeks postoperatively and to 44.40 ± 8.78 ml/sec at 3 months postoperatively in TURP group. In open prostatectomy group, the mean maximum urinary flow rate increased from 5.57 ± 2.24 ml/sec preoperatively to 29.40 ± 10.96 ml/sec at 3 weeks postoperatively and to 52.80 ± 12.36 ml/sec at 3 months postoperatively. The improvement in mean maximum flow rate was more in open prostatectomy group ($p=0.01$). This observation was consistent with study conducted by Simforoosh N, Abdi H, Kashi AH, et al. (2010)⁶, 100 patients of benign prostatic hyperplasia were operated upon (51 underwent open prostatectomy and 49 underwent TURP). The mean maximum flow rate improvement was 11.1 ml/sec (7.6 to 14.2 ml/sec) in open prostatectomy group and 8.0 ml/sec (2.2 to 12.6 ml/sec) in TURP group ($p=0.02$). The improvement in mean maximum flow rate was more in open prostatectomy group.

The mean average flow rate increased from a preoperative value of 4.05 ± 1.03 ml/sec to 23.62 ± 9.62 ml/sec at 3 weeks postoperatively and to 23.90 ± 7.83 ml/sec at 3 months postoperatively in TURP group. In open prostatectomy group, the mean average flow rate increased from a preoperative value of 3.79 ± 1.77 ml/sec to 20.71 ± 9.92 ml/sec at 3 weeks postoperatively and to 31.81 ± 7.94 ml/sec at 3 months postoperatively. The improvement of mean average flow rate was more in open prostatectomy group than TURP group ($p=0.008$), whereas, the mean maximum detrusor pressure decreased from preoperative value of 54.05 ± 13.80 cm H₂O to 25.50 ± 5.67 cm H₂O at 3 weeks postoperatively and to 26.05 ± 2.39 cm H₂O at 3 months in TURP group. Mean maximum detrusor pressure decreased from preoperative value of 55.70 ± 12.04 cm H₂O to 26.70 ± 3.06 cm H₂O at 3 weeks postoperatively and to 20.70 ± 2.96 cm H₂O at 3 months postoperatively. The decrease in the mean detrusor pressure was more in open prostatectomy group than TURP group at 3 months postoperatively and was statistically significant ($p = 0.0001$).

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CONCLUSION: Open prostatectomy is an acceptable operation for the prostates sized >50 grams. Higher peak flow rate improvement, average flow rate improvement and less detrusor pressure was evident in patients treated with open prostatectomy group. Open prostatectomy is a better procedure than transurethral resection of prostate as per as the urodynamic outcome is taken into consideration.

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