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EFFECTS OF TRANSURETHRAL RESECTION OF PROSTATE (TURP) ON UROFLOWMETRY PARAMETERS ON PATIENTS HAVING BENIGN PROSTATIC HYPERPLASIA

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ABSTRACT

OBJECTIVE: *To assess the effects of transurethral resection of prostate (TURP) on urinary flow rate / uroflowmetry in patients with benign prostatic hyperplasia preoperatively and following transurethral resection of prostate (TURP) for three months post opera operatively.*

MATERIALS AND METHODS: *This prospective study was conducted at department of urological surgery and transplantation at Jinnah post graduate medical centre (JPMC) Karachi between March 1999 to March 2002. Fifty consecutive patients age range 50 years to 80 years, on clinically diagnosed of benign prostatic hyperplasia (BPH) were include in the study, Preoperatively uroflowmetry is carried out followed by uroflowmetry post transurethral resection of prostate (TURP), after first month, second month and third month.*

RESULTS: *Mean age 63.62±6.75 years.*

Uroflowmetry parameter among fifty patients before operation (TURP) are found, mean voiding time 32.37 ± 19.19 seconds, mean flow time 28.57 ± 15.79 seconds, mean time to maximum flow 9.64 ± 6.65 seconds, mean maximum follow rate 7.60 ±2.41 ml/sec, mean average flow rate 4.41 ±1.28ml/sec and mean voided volume 165.54 ml. Postoperative (TURP) uroflowmetry was carried out after first month, second month and third month's. The average of first three months of postoperative follow up uroflowmetry parameter obtained are, voiding time 27.64±11.67 (P=0.14) seconds, flow time 25.72±11.00 (P=0.29) seconds, time to maximum flow 6.59 ± 0.79 (P=0.05) second maximum flow rate 27.24 ±5.11 (P=0.001) ml second, average flow rate 13.48 ± 2.08 (P= 0.001) ml second, voided volume 240.32 ± 49.91 (P=0.01) ml.

The change in average from first month to third month of operation, uroflowmetry parameters found statistically significant in time to maximum flow, maximum flow rate, average flow rate and voided volume. While voiding time, and flow time are determine statistically non-significant, when tested by F-statistics.

CONCLUSION: *We conclude that the effects of post transurethral resection of prostate, all the obstructive uroflowmetry parameters return more or less towards normal levels. As well as excellent improvements in both obstructive and irritative symptoms was also observed.*

KEY WORDS: BPH, uroflowmetry, TURP.

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INTRODUCTION

Benign prostatic hyperplasia (BPH) is the most common disorder of the prostate gland.Histologic hyper plastic growth of prostate begins in approximately 40% of men aged 50 years and above. By age eighty, almost 90% of men have histological evidence of benign prostatic hyperplasia.[1, 2]

Patients with BPH have early clinical features like hesitancy, intermittency, frequency, nocturia, urgency, terminal dribbling, polyuria, difficulty in micturation, week urinary stream, incontinence of urine, and sometimes heamaturia, [3]. Late clinical features will develop more serious sequelae of disease with urinary retention, recurrent urinary tract infection, bladder stone, bladder failure, renal dysfunction[4]. These symptoms may be due to bladder outflow obstruction caused by Benign Prostatic Hyperplasia (BPH) or due to detrusor hyper-reflexia.

The informative test to evaluate patients with Benign Prostatic Hyperplasia (BPH) is uroflometry. In spite of certain restrictions, uroflometry yields a high level of information, besides being a simple, at any time reproducible, and non-invasive procedure. Due to its

low costs, it should be the primary step in diagnostics in the clinic as well as for practitioners[5, 6, 7, and 8]

The uroflowmetry which is done by an electronic instrument to calculate the velocity of urine flow. Uroflometry results in a normal 70-year old with no evidence of BPH has average flow rate of 12ml/sec and peak flow rate close to 20ml/sec having at least 125-150ml in the bladders, with mild enlarged BPH has average flow rates 6-8ml/sec and 11-15ml/sec peak flow rate and severe enlarged BPH has further decrease flow rates[9].

Transurethral resection of prostate is the most widely accepted method of treating Prostatic urethral obstruction in patient with benign prostatic hyperplasia and is considered the "gold standard" against which other treatments should be compared[10, 11]. Comparison of the results of uroflometry performed in patients in large or small adenomas showed that transurethral resection of prostate (TURP) was successful in both groups. The age of operated patients seemed to have no influence on the results of uroflometry after transurethral resection of prostate (TURP) [12, 13].

MATERIAL AND METHODS

This prospective study was conducted at department of Urological Surgery and Transplantation at Jinnah Postgraduates Medical Center (JPMC) Karachi, between March 1999 to March 2002. These fifty consecutive patients with benign prostatic hyperplasia (BPH) were included in the study. Pre operatively Uroflometry was carried out followed by uroflometry post transurethral resection of prostate (TURP) after thirty days, sixty days and ninety days and their results were co-related.

The age range of the patients included in the study was 50 to 80 years. The average was 63.62 years. (See Table No.1).

INCLUSION CRITERIA

Only those patients who presented with lower urinary tract symptoms due to enlarged prostate but neither have developed retention of urine, nor catheterized were included in this study.

EXCLUSION CRITERIA

Following patients were excluded from study,

1. With carcinoma prostate
2. With urethral stricture
3. With bladder neck stricture
4. With diabetes mellitus
5. Patients taking drugs for BPH
6. Catheterized patients
7. With bladder atonia
8. Urinary incontinence

Table No.1

Age of the patients
Total no. Of patients=50
Age range: 50-80 years
Average age=63.62 years

Age rang in years	No. of Patients	Percentage
50-55	5	10%
56-60	17	34%
61-65	7	14%
66-70	14	28%
71-75	5	10%
76-80	2	4%

Table No.2

Weight of prostatic gland (Ultrasound)
Minimum weight of prostate=37 mls
Maximum weight of prostate=77 mls
Average weight of prostate=60.46 mls

Weight of prostate in mls	No. of patients	Percentage of patients
1-30	0	0%
31-40	3	6%
41-50	8	16%
51-60	13	26%
61-70	19	38%
71-80	7	14%

Table No.3

Pre-Operative uroflowmetry parameters

PRE-OPERATIVE PARAMETERS

Voiding Time (n=50)	32.37 ± 19.19 Seconds (27.5)
Flow Time (n=50)	28.57 ± 15.76 Seconds (24.0)
Time to Max : Flow (n=50)	9.64 ± 6.65 Seconds (6.00)
Max: Flow rate (n=50)	7.60± 2.41 ml/sec (7.5)
Average Flow rate (n=50)	4.44± 1.28 ml /sec (4.55)
Voided volume (n=50)	165.54± 49.60 ml (170.0)

Figure in parentheses are median values

Pre operative assessments:-

A care full history especially about the symptoms was taken in all fifty patients. A thorough physical digital rectal examination of the prostate gland was done. All the necessary investigations including ultrasound KUB, X-ray KUB, blood CP and group urine DR, urine C/S, renal function tests and blood sugar were carried out. In selected patients intravenous urography and prostatic specific antigen (PSA) was also done. Anesthesia fitness was taken.

The average weight of prostate gland on ultrasound finding was 60.46 mls while minimum weight of prostate gland 37 mls. (See Table No.2).

Majority of patients were operated under spinal anesthesia and in few patients under general anesthesia. Foleys catheter removed on second or third day post operatively. Patients were discharged with adequate urinary flow.

Post-operative Follow up studies

The follow up studies were done for three months after removal of catheter post-

operatively on following periods, with uroflometry, after first, second and third month of removal of catheter.

RESULTS

Pre-Operative Uroflowmetry Parameters:-

Among fifty patients before operation the mean voiding time was found 32.37±19.19 sec (mean ± S.D), median time was 27.5 sec, fig: 1. The mean flow time was found 28.57±15.79sec (mean ± S.D), median time was 24.0 sec fig: 2. The mean time to maximum flow was 9.64 ± 6.65 sec (mean ± S.D), median time 6.0sec fig: 3. The mean maximum flow rate was 7.60 ± 2.41ml/sec (mean ± S.D), median value 7.5ml/sec fig: 4. The mean average flow rate was 4.44 ± 1.28ml/sec (mean ± S.D), median value 4.44ml/sec fig: 5. The mean voided volume was 165.54 ± 49.60ml (mean±S.D), median value 170.0 ml, fig: 6 (TABLE: 3).

Post-Operative Follow Up (After First Month, Second Month and Third month) Uroflowmetry Parameters:-

At the end of the first to third month of operation mean voiding time of fifty patients was 28.26±14.68 sec, 27.08±11.12 sec and 27.75±12.01 sec respectively with median values were 25 seconds. The average of first three months post operative was 27.64±11.67sec with median value 27.64sec fig: 1. The change in average time from first to third month of operation was found statistically non-significant with P>0.014, when tested by F-Statistics.

Mean flow time of fifty patients from first to third month was 26.1±13.2sec, 25.12±10.70sec and 26.14±11.27sec respectively and their median values were 23.5, 22.5 and 23.5sec respectively. The average of first three months of post operative follow up was 23.33 sec fig: 2. The change in average time from first to third month of operation was found statistically non significant with P>0.29, when tested by F-statistics

The mean time to maximum flow of fifty patients from first to third month 6.48±1.19sec, 6.64±1.08sec and 6.85±1.10sec, with their median values 7sec, 7sec, 7sec respectively. The average of the first three months of the post operative was 6.59±0.79sec fig: 3. The change in average time from first to third month if operation was found statistically significant with P<0.05 when tested by F.staistics.

At the end of the first, second and third month of operation, mean maximum flow rate of fifty patients was 26.03±7.15ml/sec with median value 26.45ml/sec, 27.5±5.33ml/sec with median value 27.55ml/sec, 37.39±4.91ml/sec respectively. The average of first three months post operative

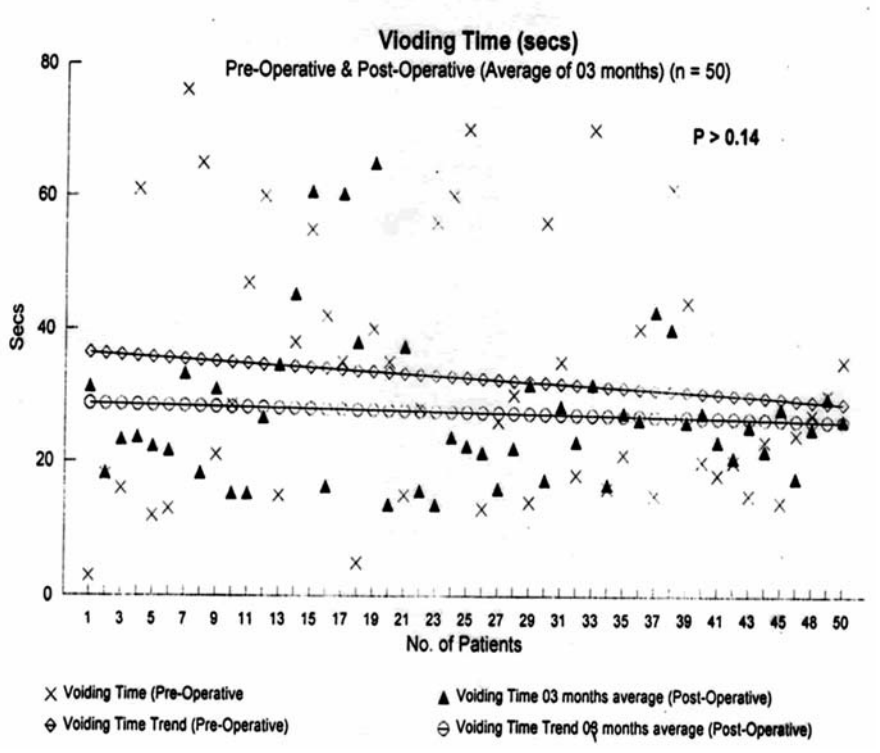
Table No.4

POST-OPERATIVE UROFLOWMETRY PARAMETERS (n=50)

Parameters	First Month Follow up	Second Month Follow up	Third Month Follow up	Average of Three Follow Up
Voiding Time (n=50)	28.26 ± 14.68 (25.50)	27.08 ± 11.12 (26.0)	27.75 ± 12.01 (25)	27.64 ± 11.67 (27.64) P>0.14 T=1.48
Flow Time (n=50)	26.1 ± 13.20 (23.5)	25.12 ± 10.70 (22.50)	26.14 ± 11.27 (23.5)	25.72 ± 11.00 (23.33) P>0.29 T=1.05
Time to Max : Flow (n=50)	6.48 ± 1.19 (7.00)	6.64 ±1.08 (7.0)	6.58 ± 1.10 (7.00)	6.59 ± 0.79 (6.33) P<0.05 T=3.06
Max: Flow rate (n=50)	26.03±7.15 (26.45)	27.53±5.33 (27.55)	37.39±4.91 (27.25)	27.24±5.11 (26.9) P<0.001 T=23.12
Average Flow rate (n=50)	12.66±3.01 (12.45)	13.69±2.53 (13.2)	13.76±2.05 (13.5)	13.48±2.08 (13.17) P<0.001 T=24.33
Voided Volume	234.20±70.44 (210)	249.79±77.63 (230)	234.58±38.22 (230)	240.32±49.91 (231.0) P<0.01 T=7.44

Figure in parentheses are median values

FIGURE 1.



follow up was 27.24±5.11ml/sec fig: 4. The change in average from first month to third month of operation was found statistically significant with P<0.001 when tested by F statistics.

The mean average flow rate of fifty patients in first, second and third months was 12.66±3.0ml/sec, with median value 12.45ml/sec, 13.69ml+2.53ml/sec with median value 13.2ml/sec and 13.76±2.05ml/sec with median value 13.5ml/sec respectively. The average of first three months of post operative follow up was 13.48±2.08ml/sec, with median value 13.17ml/sec fig: 5. The change in average from first to third month of operation was found statistically significant with P<0.01 when tested by F. statistics.

From first to third month of operation mean voided volume was 234.20±70.44ml with median value 210ml, 249±77.63ml with median 230ml, and 234.58±38.22ml with median 230ml. The average of first three months of post operative follow up was 240.32±49.91ml, with median value 231.00ml fig: 6. The change in average from first month to third month of operation was found statistically significant with P<0.01, when tested by F. statistics. (See Table No.4).

DISCUSSION

Benign prostatic hyperplasia is a disease of old men which leads to urinary problems due to effects on both obstructive and irritative symptoms of enlarged prostate such as hesitancy, frequency, urgency, dribbling of urine and dysuria make the trouble some life style, especially during night times. Patients with lower urinary tract symptoms generally seek help for relief of their symptoms and the best indicator for the successful treatment is relief of symptoms[14]. The mean ages of the patients is reported in a couple of Pakistan based studies is 63.4 year and 65.6year respectively [15, 16].In other study by Mebust et al (1989) displays the average age of 69Years for benign prostatic hyperplasia [17].

Mean age of our patients was 63.62 years which is comparable to the above two Pakistani studies but it is some what lower than that of reported by Mebust et al .The patients of our study as well as those of other Pakistani studies are younger than the western patients. It is probably due to fact that most of our elderly patients do not remember their correct date of birth, so the date of birth is entered in hospital record by rough estimations.

In the present study preoperative maximum flow rate (Qmax) was found to be 7.6 ml/sec: ± 2.41. This rate is 9.5 ml/second, and 7.lml/second reported by Nielsen _ KT et

FIGURE 2.

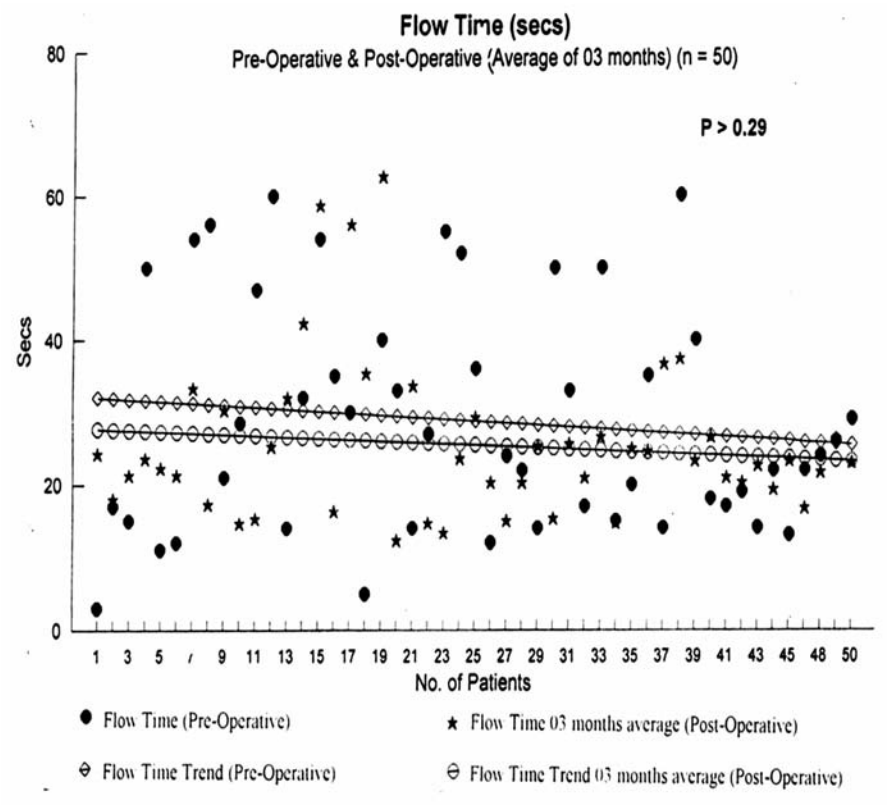
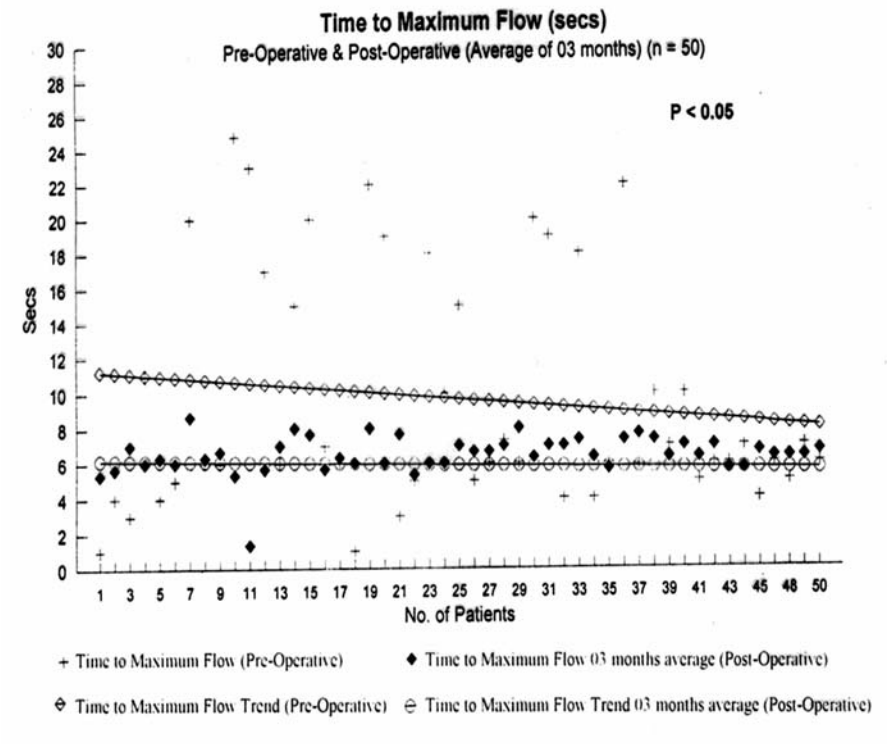


FIGURE 3.



al (1989) and larosa-M-etal (1993) respectively [18, 19]. These findings are more or less similar to that of our study.

It has been observed that in all patients there was obstructed Symptom and significantly reduced maximum flow rate pre operatively.

In a study by Nielsen - KT et al (1989) after transurethral resection of the prostate, maximum flow rate at three months follow up is found to be 17.0 ml per second in 84 consecutive patients. In other study by Dorflinger- T etal (1988) after transurethral resection of the prostate at three months follow up, the maximum flow rate 21.5ml Second in nineteen patients[20].

The average of first three months post operative follow up of our patients (27.24± 5.11 ml/sec :) was significantly improved like those reported by above mentioned workers , the flow rate in these studies remains stable through out the follow up period .

Among the uroflowmetry parameters analyzed, the best correlation was observed between the degree of prostatic obstruction and the degree of maximum flow rate (Qmax) [21].

In the present group the pre operative average flow rate was found to be 4.44± 1.28 ml second and average first three months of post operative follow up was 13.48± 2.08 ml second .

It is analyzed that there is significant improvement in average flow rate after TURP in comparison to preoperative.

The rest of the uroflowmetry parameters in respect to transurethral resection of prostate patients with benign prostatic hyperplasia are not well documented, but we are of opinion that significant improvement also occur in other parameters as well.

CONCLUSION

We conclude that the effects of transurethral resection of prostate (TURP) on uroflowmetry parameters are significantly improved postoperatively. Our study indicates that there is excellent improvement in the maximum flow rate, average flow rate in all postoperative follow up visits. We are of opinion that transurethral resection of prostate (TURP) is still gold standard in improving the obstructive symptoms of benign prostatic hyperplasia.

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FIGURE 4.

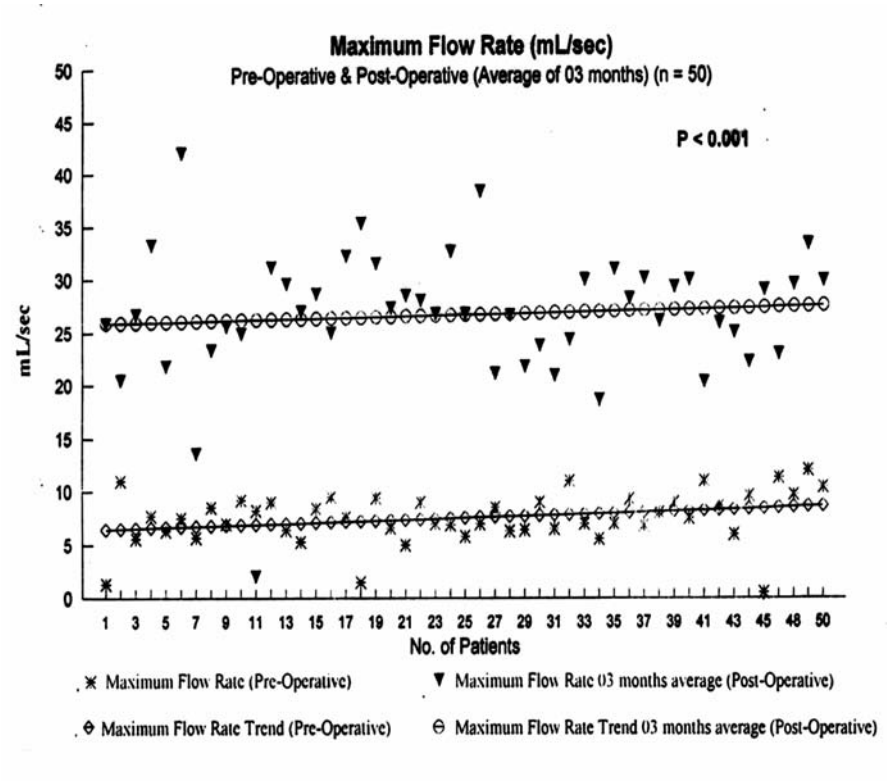
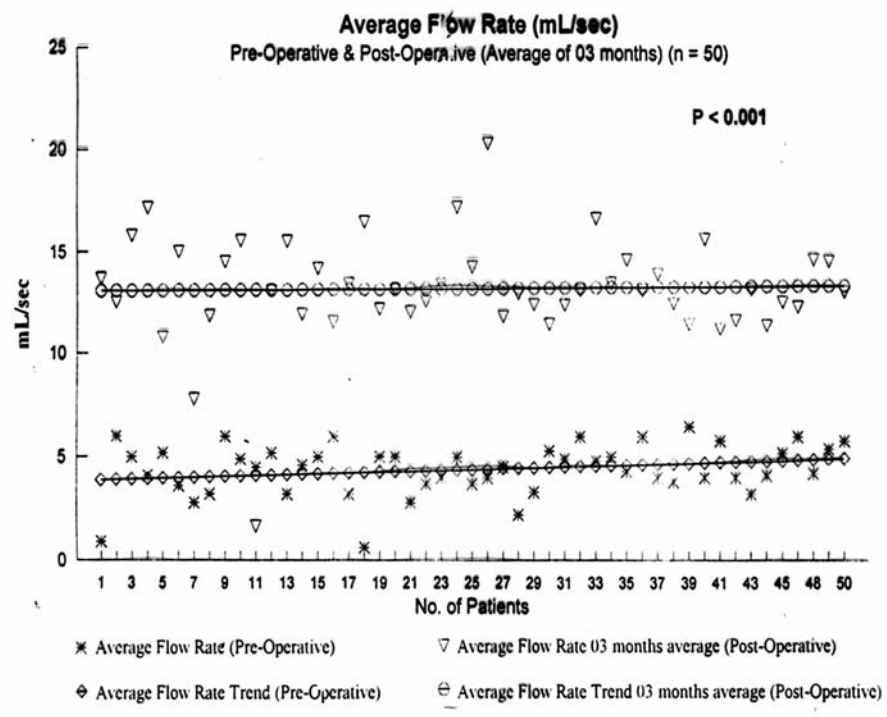


FIGURE 5.



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FIGURE 6.

