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Original Article
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Outcome of Unilateral Bladder Neck Incision In Comparison to Bilateral Incision in Case of Primary Bladder Neck Obstruction

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Abstract

Background: *Primary bladder neck obstruction is not uncommon in middle aged men. Patients with primary bladder neck obstruction usually present with voiding and storage symptoms. They are evaluated by history, physical examination, investigations and confirmed by urodynamic study. There are different modalities of treatment. It varies according to age, sex and associated conditions. If medical treatment failed, they are treated with unilateral or bilateral bladder neck incisions. Among them, per and postoperative outcome like operation time, hospital stay, voiding time, PVR, Qmax and retrograde ejaculation were assessed in both the group.*

Objectives: *The purpose of this study was to compare the operation time, postoperative hospital stay, PVR, Qmax, voiding time and retrograde ejaculation between two groups who underwent unilateral or bilateral bladder neck incision due to primary bladder neck obstruction.*

Material and methods: *This quasi experimental study was carried out in the department of urology, Dhaka Medical College Hospital, Dhaka, from July 2013 to June 2015. Male patients with lower urinary tract symptoms due to primary bladder neck obstruction were the study population. Sixty patients were selected from Urology OPD as sample according to inclusion and exclusion criteria. Then, they were divided into two groups purposively, designated as group I and group II for unilateral and bilateral bladder neck incision respectively to see the per and postoperative outcome like operating time, hospital stay, voiding time, PVR, Qmax and retrograde ejaculation*

Results: *Total 60 patients were recruited in this study of which 30 patients were in group I and the rest of 30 patients were in group II. The mean age with a SD was 28.33 ± 5.33 years and 28.20±5.49 years in group I and group II respectively ($p>0.05$). In group I, the mean ± SD of operative time was 19.9±3.26 min within a range 15-25 min. In group II, the mean ± SD of operative time was 27.16 ±2.65 min within a range 20-30 min ($p<0.05$).In group I mean (SD) hospital stay was 2.10 ± 0.30 day, in group II it was 2.40 ± 0.56 day*

Keywords: BNI, Unilateral , Bilateral , Bladder Neck Obstruction

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(p<0.05). In this study 2(6.7%) patients and 8 (26.7%) patients had retrograde ejaculation in group I and in group II respectively (p<0.05). In group I, Mean ± SD of voiding time was 25.33 ± 6.83 sec. In group II, Mean ± SD of voiding time was 24.90 ± 4.41 sec. (p>0.05). In group I, the mean (SD) Qmax was 24.37±4.79 ml/sec where in group II, it was 26.16 ± 3.69 ml/sec (p>0.05). Mean(SD) PVR in group 1 was 18.03 ± 3.31 ml, in group 2 it was 17.03 ± 3.31 ml(p>0.05).

Conclusions: *Unilateral bladder neck incision is better than conventional bilateral bladder neck incision in primary bladder neck obstruction of young aged men.*

Keywords*: Primary bladder neck obstruction, unilateral bladder neck incision (UBNI), bilateral bladder neck incision (BBNI).*

Introduction

Primary bladder neck obstruction (PBNO) is a condition in which the bladder neck fails to open adequately during voiding, or obstruction of urinary flow in the absence of another anatomic obstruction, such as that caused by benign prostatic enlargement in men. Urodynamically proven PBNO may result from bladder neck hypertrophy, bladder neck stenosis, functional obstruction due to neuropathic conditions. Primary bladder neck obstruction (PBNO) was first described in men by Marion in 1933.[1] Later, Turner-Warwick, Whiteside and Worth[2] advocated the use of urodynamics and voiding cystourethrography to diagnose bladder outflow obstruction in men aged 50 years or younger with a long history of lower urinary tract symptoms (LUTS). Similarly, Norlen and Blaivas3 diagnosed vesical neck obstruction in 23 young and middle-aged men with prior diagnoses of prostatitis, neurogenic bladder, and psychogenic voiding dysfunction. Leadbetter[4] proposed that there is a fault of dissolution of mesenchyme at the bladder neck or inclusion of abnormal amounts of nonmuscular connective tissue, resulting in hypertrophic smooth muscle, fibrous contractures, and inflammatory changes. The true prevalence of PBNO in the male and female populations is not known. In a retrospective review of 137 men aged 50 years or younger with chronic voiding dysfunction and abnormal urodynamics, Kaplan and colleagues reported a 54% incidence of primary bladder neck obstruction.[5] Primary bladder outflow obstruction may present with a variety of symptoms, including voiding symptoms (decreased force of stream, hesitancy, intermittent stream, incomplete emptying), storage symptoms (frequency, urgency, urge incontinence, nocturia), or a combination of both.[6] Primary bladder neck obstruction is a urodynamic diagnosis, the hallmark of which is relative high-pressure, low-flow voiding with radiographic evidence of obstruction at the bladder neck with relaxation of the striated sphincter and no evidence of distal obstruction.[7]

The treatment options for men with primary bladder neck obstruction are include watchful waiting, pharmacotherapy, and surgical intervention. Among the surgical interventions, unilateral and bilateral bladder neck incisions frequently performed. Though both procedures have some per and postoperative common benefits and complications, my study is to compare urodynamic findings in men with primary bladder neck obstruction (PBNO) using the 2 groups after performing unilateral and bilateral bladder neck incision respectively.

Methods

This was a prospective quasi experimental study, carried out in urology department of Dhaka Medical College Hospital, from July-2013 to June-2015. Patients with lower urinary tract symptoms due to primary bladder neck obstruction who attended in urology OPD were my study population. Then they were evaluated by history, physical examination and some investigations. Patients who presented with voiding symptoms, detailed history were taken carefully and graded according to American Urological Association (AUA) scoring system. History of medical treatment by alfa blocker at least six months and history of sexual function, especially, of retrograde ejaculation, and quality of life score were evaluated and recorded. All patients were evaluated by ultrasonography, urinalysis, CBC, blood urea and serum creatinine. Urodynamic study and micturating cystourethrography was done preoperatively in all cases. Routine investigations like ECG, Chest X-ray P/A view, and random blood sugar were also done. Then 60 male patients, age 20-40 years old with lower urinary tract symptoms (LUTS) due to primary bladder neck obstruction with clear urodynamic evidence were included as sample in this study according to inclusion

and exclusion criteria. Male patients with LUTS, age 20-40 years, prostate <20gm, were included in this study. On the other hand patients with voiding difficulty due to other causes, have previous history of surgery, severe co-morbidities, bleeding disorders and unable to provide written consent were excluded in this study, Then they were divided into two groups purposively: 30 patients underwent unilateral bladder neck incision (Group-1) and the remaining 30 patients underwent bilateral bladder neck incision (Group-2). They were termed as UBNI and BBNI group respectively, informed written consent was taken from all patients and permission from ethical committee was taken. After preoperative preparation, counseling and consent all patient were given spinal regional anaesthesia and placed in lithotomy position. Then preliminary urethrocystoscopic evaluation was done. In group-1(UBNI), unilateral bladder neck incision was performed. Here, a single deep incision was made at 5 or 7 o'clock position using Collin's knife in every patient. In group-2(BBNI), two deep incisions, at 5- and 7-0'clock positions were made using Collin's knife. In both groups, every incision was made from the trigon just below the ureteral orifice, cutting the bladder neck and prostate to the side of proximal end of verumontanum and the incision was deepen up to perivesical fat. A 26-Fr continuous flow resectoscope was used in all procedures. Glycine (1.5%) solution was used as irrigation fluid. At the end of procedures, a 22-Fr three way Foley catheter was passed, balloon inflated to 30 - 50 ml of distilled water and connected to a closed drainage system. Postoperatively, bladder was irrigated with normal saline and continued till wash out is clear. In every patient, the total operating time, amount of irrigation fluid used in liters, postoperative catheterization period and hospital stay were observed and recorded. No patient required blood transfusion.Every patient was followed up at 1st, 3rd and 6th month postoperatively. In each follow up voiding symptoms (AUA symptoms score), sexual history especially, of ejaculation, was taken. Dry coitus was considered as retrograde ejaculation which was proved by post coital urine examination and culture sensitivity done to see any infection. Uroflowmetry and ultrasonography were done for each patient to find out maximum and average flow rate and post void residual volume of urine respectively.

Ethical Considerations:

Prior to commencement of the study, the aims and objectives of the study along with its procedure, risk and benefit of the study was explained to the patients. It was assured that all information and records would be kept confidential and the procedure would be helpful for both attending surgeon and patients in making decision.

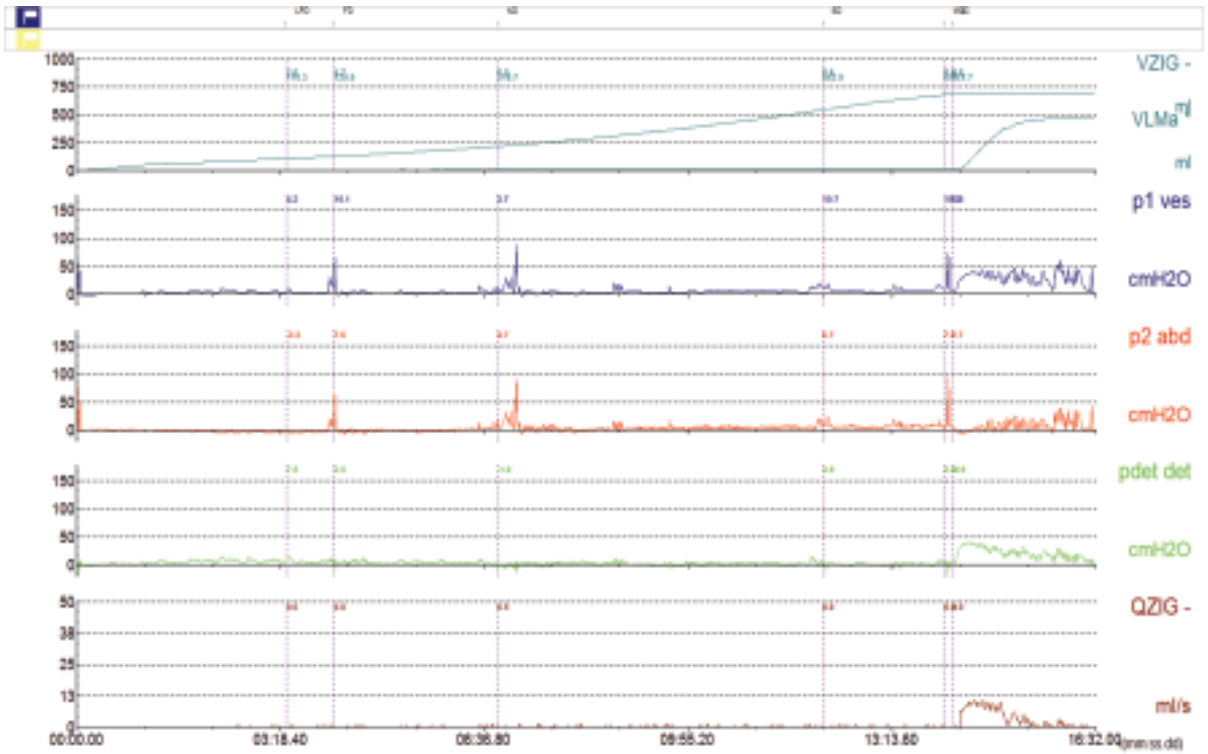

Fig.-1: *Urodynamic study showing poor flow with prolong voiding*

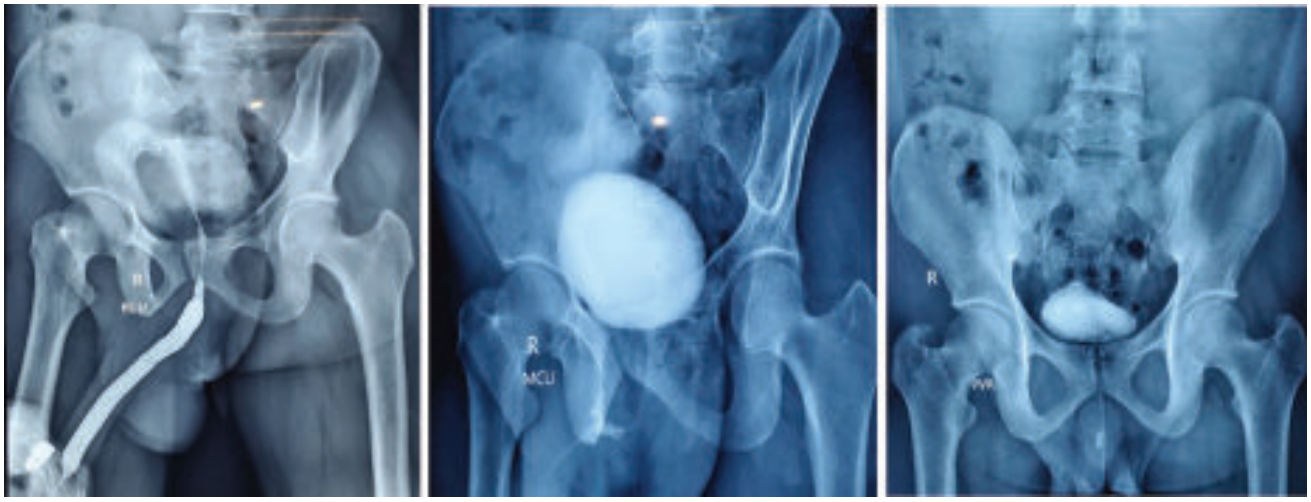

Fig.-2: *RGU & MCU films show high bladder neck with residual urine.*

RESULTS

Table I: *Distribution of patients according to age*

Age	Group		p value
	Group I (UBNI) n (%)	Group II (BBNI) n (%)	
20 – 25	10 (33.3)	11 (36.7)	
26 – 30	11 (36.7)	10 (33.3)	
31 – 35	6 (20.0)	5 (16.7)	
36 – 40	3 (10.0)	4 (13.3)	
Total	30 (100.0)	30 (100.0)	0.954
Mean ± SD	28.33±5.33	28.20±5.49	0.824

t test was done to measure the level of significance.

Table I shows distribution of patients by age in two groups. The mean age was 28.33±5.33 years in Group I and 28.20±5.49 years in same age range in Group II. There was no significant difference in age between these two groups (p>0.05).

Table II: *Distribution of patients according to duration of operation and hospital stay*

Variables	Group		p value
	Group I (UBNI) Mean ± SD	Group II (BBNI) Mean ± SD	
Duration of operation (Minutes)	19.9 ± 3.26	27.16 ± 2.65	<0.001
Hospital stay (days)	2.10 ± 0.30	2.40 ± 0.56	0.013

t test was done to measure the level of significance.

Table II shows per and postoperative findings. Mean (SD) duration of operation was 19.9 (3.26) minutes and 27.16 (2.65) minutes in group I and group II respectively. The difference between these two groups was statistically significant (p<0.05). Mean (SD) hospital stay was 2.10 (0.30) days and 2.40 (0.56) days in group I and group II respectively. The difference between these two groups was statistically significant (p<0.05).

Table III: *Distribution of patients according to voiding time*

Voiding time (Second)	Group		p value (between groups)
	Group I (UBNI) Mean ± SD	Group II (BBNI) Mean ± SD	
Preoperative	51.63±10.71	53.83±4.37	0.302*
1st follow up	35.33±6.83	29.86±4.40	0.001*
2nd follow up	32.33±6.83	27.93±4.43	0.004*
3rd follow up	25.33±6.83	24.90±4.41	0.772*
p value (with in groups between preoperative and 3rd follow up)	<0.001#	<0.001#	

*Independent t test was done to measure the level of significance.

#Paired t test was done to measure the level of significance.

Table III shows voiding time at different follow ups in groups. There was statistical significant difference in voiding time between preoperative and at the time of 3rd follow up in both groups (p<0.05). That means voiding time in both groups at 3rd follow up almost same. But in comparison with preoperative mean value, in both group voiding time significantly reduced.

Table IV: *Distribution of patients according to post void residual (PVR)*

Post void residual (ml)	Group		p value (between groups)
	Group I (UBNI) Mean±SD	Group II (BBNI) Mean±SD	
Preoperative	101.10±10.82	105.73±11.50	0.114*
1st follow up	26.16±5.96	24.16±5.66	0.188*
2nd follow up	22.30±3.44	21.00±3.36	0.145*
3rd follow up	18.03±3.31	17.03±3.31	0.248*
p value (with in groups between pre-operative and 3rd follow up)	<0.001#	<0.001#	

*Independent t test was done to measure the level of significance.
#Paired t test was done to measure the level of significance.

Table IV shows post void residual (PVR) at different follow ups in groups. The difference between these two groups was not statistically significant (p>0.05). There was statistical significant difference in PVR between preoperative and at the time of 3rd follow up in both groups (p<0.05).

Table V: *Distribution of patients according to maximum urinary flow rate (Qmax)*

Qmax (ml/sec)	Group		p value (between groups)
	Group I (UBNI) Mean±SD	Group II (BBNI) Mean±SD	
Preoperative	7.96±0.99	8.43±1.57	0.172*
1st follow up	20.38±5.25	22.26±3.95	0.123*
2nd follow up	22.51±5.10	23.85±4.06	0.266*
3rd follow up	24.37±4.79	26.16±3.69	0.111*
p value (with in groups between preoperative and 3rd follow up)	<0.001#	<0.001#	

*Independent t test was done to measure the level of significance.

#Paired t test was done to measure the level of significance.

Table V shows Qmax at different follow ups in groups. There was statistical significant difference in Qmax between preoperative and at the time of 3rd follow up in both groups (p<0.05). Here Qmax after both procedure in each follow up is all most same but in comparison with pre- operative base line it is significantly improved.

Table VI: *Distribution of patients according to retrograde ejaculation*

Retrograde ejaculation	Group		p value
	Group I (UBNI) Mean±SD	Group II (BBNI) Mean±SD	
1st follow up	2 (6.7)	8 (26.7)	0.038
2nd follow up	2 (6.7)	8 (26.7)	0.038
3rd follow up	2 (6.7)	8 (26.7)	0.038

Chi-square test was done to measure the level of significance.

Table VI shows retrograde ejaculation at different follow ups in groups There was statistical significant difference between these two groups (p<0.05). No change was observed at the time of 2nd and 3rd follow up among the patients regarding retrograde ejaculation.

Discussion

Primary bladder neck obstruction (PBNO) can be treated surgically with unilateral or bilateral transurethral incision of the bladder neck. In these procedures incisions were made at 5 or 7 o'clock and 5 & 7 o'clock position in unilateral and bilateral bladder neck incision respectively. Here outcome of unilateral bladder neck incision are compared with that of bilateral incision in primary bladder neck obstruction. This Quasi experimental study was carried out in the Department of Urology, Dhaka Medical College Hospital, Dhaka from the period of 1st July 2013 to 30th June 2015. In this study 60 patients with lower urinary tract symptoms (LUTS) due to primary bladder neck obstruction with clear urodynamic evidence were enrolled as sample, taken from Urology department of Dhaka Medical College and Hospital, Dhaka. The patients were divided into two groups: 30 patients under went U-BNI (Group I) and the remaining 30 underwent B-BNI (Group II).

According to analysis of age distribution, there was no significant difference between two groups. The mean age was 28.33±5.33 years in Group I and 28.20±5.49 years in Group II. Unilateral bladder neck incision was performed by Kochakarn and Lertsithichai [**8**] in 35 men aged 36 to 46 years. Mean age of the men was 41 years in the study of Trockman and colleagues [**9**]. Patients of this study were younger than other studies.

Unilateral bladder neck incision (UBNI) took less time comparing bilateral bladder neck incision (BBNI) and postoperative hospital stay was less in UBNI than that of bilateral bladder neck incision (BBNI) in our study. Mean operative time was 20.23 mins (10-35) in TUIP (BBNI) group in the study of Robbani and colleagues[10] which was less than our study.

In our study voiding time was reduced in both groups. Neykov and his colleagues[11] also found significant reduction of the voiding complaints.

Eighty two percent (82%) patients reported satisfactory outcome, decrease in post void residual (PVR) postoperatively.[12] In both groups mean PVR were reduced but at the time of 3rd follow up there was statistical significant difference between these two groups. In the study of Manaheji and Khezri[13] it was seen that preoperative PVR was 150c and post-operative PVR was 50c where unilateral bladder neck incision done. Their result was consistent with this study. In the study of Wang et al. where bilateral bladder neck incision was done, mean PVR was 39 ± 31 ml after 3 months of the operation. This result was also consistent with this study[6] reported the results of unilateral incision in 31 men.

Thirty men experienced a subjective improvement in symptoms, with mean Q_{max} increasing from 9.2 ml/s to 15.7 ml/s. Postoperative measurements of peak urinary flow rate (PFR) were above 15 ml/s in 78% of the patients.[11] Eighty two percent (82%) patients reported satisfactory outcome, increased maximum flow rate (Qmax) postoperatively.[12] There was marked symptomatic improvement after unilateral transurethral incision of the bladder neck. The mean peak urine flow rate increased from 7.2 ml/s to 16.8 ml/s. In the study (UBNI) of Manaheji and Khezri[13] it was seen that mean Qmax was 7ml/s and postoperative Qmax was 18ml/s. Result of our study was consistent with the result of above studies. In a study by Trockman et al.[9], 18 of 36 men diagnosed with PBNO underwent bilateral incision. A successful outcome was obtained in 16 (89%) of the men. Qmax increased from 8.2 mL/s to 26.7 mL/s. All the results mentioned above were consistent with this study result.

The major concern in conventional bilateral bladder neck incision is postoperative retrograde ejaculation, which may occur in 27%-100% of patients having the procedure. Retrograde ejaculation was less likely to occur in unilateral incision.[3,9] In our study retrograde ejaculation was observed among 2 (6.7%) patients and 8 (26.7%) patients in group I and group II respectively at the time of 1st follow up. There was significant difference between these two groups ($p<0.05$). Retrograde ejaculation occurred in 16% cases in the study of Moisey, Stephenson and Evans.[14] In 1994, Kaplan and colleagues reported the results of unilateral incision in 31 men. No retrograde ejaculation was reported in the study of Kaplan, Te and Jacobs[6] with unilateral incision. Kaplan, Te and Jacobs[6] and Webster, Lockhart and Older[15] reported that all the patients retained antegrade ejaculation after unilateral incision of the bladder neck. Five men (8%) reported retrograde ejaculation after bilateral transurethral incision of the bladder neck. Our result was almost similar to the above studies.

Conclusion

This study permits to conclude that unilateral bladder neck incision is better than conventional bilateral incision in primary bladder neck obstruction. Unilateral incision significantly reduced the retrograde ejaculation, operative time and the length of hospital stay. Other parameters like maximum urinary flow rate (Q_{max}), voiding time and PVR were almost same with bilateral incision. Therefore the unilateral bladder neck incision is preferable in young men with primary bladder neck obstruction.

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