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Safety and Efficacy of Middle Lobe Transurethral Resection in Patients with Benign Prostatic Hyperplasia

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Abstract

Background: Unfortunately, the conventional transurethral prostate resection approach is associated with loss of antegrade ejaculation in about 65 to 80 % of patients. Loss of ability to ejaculate is by far the most common concern in relatively young men with benign prostatic hyperplasia undergoing standard transurethral resection procedure. The aim of the study was planned and carried out in order to compare the outcome of ejaculatory preserving middle lobe TURP with that of the standard TURP in a groups of relatively young Iraqi patients (< 65) with benign prostatic hyperplasia.

Methods: The current comparative prospective study was carried out in the urology department of Hilla Teaching Hospital, Babel province, Iraq. The study included a total of 60 men with symptomatic benign prostatic hyperplasia, 30 of them underwent middle lobe only TURP and the remaining patients underwent standard whole TURP. The groups were followed up for one year for principal outcome of erectile dysfunction and preservation if antegrade ejaculation.

Results: The duration of operation was significantly less in middle lobe TURP in comparison to that of standard whole TURP (P <0.05). The frequency of men with erectile dysfunction was significantly less in middle lobe TURP in comparison to that of standard whole TURP (P <0.05). The frequency of men with preservation of ejaculation was significantly higher in middle lobe TURP in comparison to that of standard whole TURP (P <0.05). There was no significant difference in mean IPSS, Q max and PVRU between both groups (P > 0.05), despite being better in standard whole TURP.

Conclusion: Middle lobe TURP appears more appropriate for mean < 65 years of age with prominent middle lobe benign prostatic hyperplasia in terms less operative time, less frequency of postoperative erectile dysfunction and preservation of ejaculation in comparison to standard whole TURP.

Key words: middle lobe transurethral resection in patients, benign prostatic hyperplasia, Iraq

Introduction

The most prevalent symptomatic urological pathology in elderly men is benign prostatic hyperplasia as it is seen in about 50 % of males over 80. Despite it begins as a small microscopic growth, it enlarges till become

sufficient to cause lower urinary tract obstruction and by doing so it leads to a constellation of clinical manifestations collectively called lower urinary tract symptoms (LUTS) [1,2]. These manifestations include incomplete bladder emptying, dysuria, weak urinary stream, bladder outlet obstruction and nocturnal [3, 4]. The etiology of this disorder is not fully clear; however, a number of factors have been proposed such as hormonal factors, inflammatory mediators, oxidative damage and environmental factors [5]. Age is the most important risk factor and relevant clinical manifestations of lower urinary tract obstruction caused by benign prostatic hyperplasia are also directly related to increasing age [6]. Because surgical approach is associated with higher cost and risk of peri-operative morbidity and mortality, medical treatment is extensively used to control lower urinary tract symptoms in association with benign prostatic hyperplasia; nonetheless, medical treatment may be inadequate to control these symptoms and surgical approach becomes a must to get rid of significant lower urinary tract obstruction [7]. Form anatomic perspective, the prostate gland is described as being composed of a number of well-defined zones, the central zone, the transitional zone, the peripheral zone, the preprostatic area and the fibromuscular area [8]. The largest zone is by far the peripheral zone followed by the central zone and a minor contribution by the transitional zone. In case of benign prostatic hyperplasia, the peripheral zone undergoes pathological changes; therefore, it is the sole region involved in this disease [8]. The introduction of transurethral resection of prostate is dated back to 1926. This surgical approached has undergone evolution during the period from 1962 till the present time and has become the gold standard surgical approach in treating clinically significant benign prostatic hyperplasia. The use of electrical energy and irrigation solution in addition to the complicated nature of this operation make a number of complications to associate this type of operation such as TUR syndrome, bleeding and even the need for reoperation sometimes [9-12]. One of the principal phases of male sexual activity is the process of ejaculation [13]. Unfortunately, the conventional transurethral prostate resection approach is associated with loss of antegrade ejaculation in about 65 to 80 % of patients [14]. In addition, some medications such as alpha receptor blockers are also associated with loss of anetgrade ejaculation [15]. Loss of ability to ejaculate is by far the most common concern in relatively young men with benign prostatic hyperplasia undergoing standard transurethral resection procedure [14]. Modifications have been proposed by a number of authors to the standard surgical approach aiming at preserving ejaculation in men under 65 years of age. These modifications included Ejaculation-Preserving Transurethral Resection of Prostate and Bladder Neck [14] and Ejaculatory Preserving Middle Lobe Only-Transurethral Resection [16]. Based on our clinical practice, the most common concern of Iraqi patients when subjected to transurethral resection is loss of ejaculation. In addition, Iraqi literatures dealing with ejaculatory preserving modified TURP are very rare; therefore, the current study was planned and carried out in order to compare the outcome of ejaculatory preserving middle lobe TURP with that of the standard TURP in a groups of relatively young Iraqi patients (< 65) with benign prostatic hyperplasia.

Methods

The current comparative prospective study was carried out in the urology department of Hilla Teaching Hospital, Babel province, Iraq. The beginning of the study is dated back to May the 5th 2018. The study continued until January the 15th 2020. The study included a total of 60 men with symptomatic benign prostatic hyperplasia, 30 of them underwent middle lobe only TURP and the remaining patients underwent standard whole TURP. The

inclusion criteria were men below 65 years of age with prominent middle lobe benign prostatic hyperplasia. The exclusions criteria were: men over 65 years of age, serum prostatic specific antigen (PSA) of > 6 ng/dl, presence of vesical stone of > 2.5 cm size, multiple vesical stones, urethral stricture, patients with diabetes mellitus, patients with neurogenic bladder and previous history of retrograde ejaculation. Following the operation all participants were followed up for one years with three main visits at one month, 6 month and 12 months. The main outcomes to be evaluated were duration of operation, international prostate symptom score, maximum flow rate (Q max), preservation of ejaculation, erectile dysfunction, and post-voiding residual volume of urine (PVRU). A formal ethical approval of the current study was issued by the Committee of Ethical Approval of the College of Medicine of Babel University. Verbal consent was also available for each participant following thorough illustration of the aim and the procedures of the current study. Statistical analysis was performed by (SPSS version 23). Quantitative data were expressed as mean, standard deviation and range. Qualitative data were expressed as number and percentage. Independent sample t-test was used to compare means of quantitative variables middle lobe and standard whole TURP groups. Chi-square test was used to compare frequencies patients with preserved ejaculation between groups. The level of significance was chosen at $P \leq 0.05$.

Results

Comparisons of mean age and duration of operation between middle lobe TURP group and standard whole TURP group are shown in table 1. There was no significant difference in mean age between middle lobe TURP group and standard whole TURP group, 60.70 ±2.63 years versus 59.97 ±2.33 years ($P = 0.257$). The mean duration of operation was significantly lower in middle lobe TURP group than in standard whole TURP group, 69.70 ±17.04 minutes versus 83.13 ±24.74 minutes, respectively ($P = 0.017$), as shown in table 1. One-month post operatively, patients with middle lobe TURP showed significantly more frequent preservation of antegrade ejaculation and significantly less frequent rate of erectile dysfunction in comparison with standard whole TURP group ($P < 0.05$); however, there was no significant difference in mean IPSS, Q max and PVRU between both groups ($P > 0.05$), despite being better in standard whole TURP, as shown in table 2.

In addition, six months post operatively, patients with middle lobe TURP showed significantly more frequent preservation of antegrade ejaculation and significantly less frequent rate of erectile dysfunction in comparison with standard whole TURP group ($P < 0.05$); however, there was no significant difference in mean IPSS, Q max and PVRU between both groups ($P > 0.05$), despite being better in standard whole TURP, as shown in table 3.

Moreover, 12 months post operatively, patients with middle lobe TURP showed significantly more frequent preservation of antegrade ejaculation and significantly less frequent rate of erectile dysfunction in comparison with standard whole TURP group ($P < 0.05$); however, there was no significant difference in mean IPSS, Q max and PVRU between both groups ($P > 0.05$), despite being better in standard whole TURP, as shown in table 4.

Table 1: Comparison of mean age and duration of operation between middle lobe TURP group and standard whole TURP group

Characteristic	**Middle lobe TURP** ***n* = 30**	**Standard TURP** ***n* = 30**	***P***

Age (years)			
Mean ±SD	60.70 ±2.63	59.97 ±2.33	0.257 † NS
Range	54 -64	56 -64	
Duration of operation (minutes)			
Mean ±SD	69.70 ±17.04	83.13 ±24.74	0.017 † S
Range	52 -111	51 -125	

***n*:** number of cases; **SD**: standard deviation; **TURP**: transurethral resection; †: independent samples t-test; **NS**: not significant at $P > 0.05$; **S**: significant at $P \leq 0.05$

Table 2: Comparison of primary outcome characteristics between middle lobe only TURP and standard whole TURP after one month

Characteristic	**Middle lobe TURP *n* = 30**	**Standard TURP *n* = 30**	***P***
IPSS	4.90 ±1.42	4.43 ±1.43	0.210 † NS
Q max (m/s)	24.87 ±4.68	25.57 ±3.96	0.534 † NS
PVRU (ml)	88.83 ±23.98	77.30 ±37.23	0.159 † NS
Preservation of ejaculation	19 (63.3 %)	11 (36.7 %)	0.039 ¥ S
Erectile dysfunction	9 (30.0 %)	17 (56.7 %)	0.037 ¥ S

Data were expressed as mean ± standard deviation; IPSS: international prostate symptom score; *n*: number of cases; **Q max**: maximum flow rate; **PVRU**: post voiding residual volume of urine; †: independent samples t-test; ¥: Chi-square test; **NS**: not significant at $P > 0.05$; **S**: significant at $P \leq 0.05$

Table 3: Comparison of primary outcome characteristics between middle lobe only TURP and standard whole TURP after six month

Characteristic	**Middle lobe TURP** ***n*** **= 30**	**Standard TURP** ***n*** **= 30**	***P***
IPSS	4.67 ±1.52	4.13 ±1.11	0.125 † NS
Q max m/s	25.50±4.75	27.00 ±3.89	0.186 † NS
PVRU	89.30 ±25.37	78.73 ±37.61	0.207 † NS
Preservation of ejaculation	17 (56.7 %)	9 (30.0 %)	0.037 ¥ S
Erectile dysfunction	9 (30.0 %)	19 (63.3 %)	0.010 ¥ HS

Data were expressed as mean ± standard deviation; IPSS: international prostate symptom score; *n*: number of cases; **Q max**: maximum flow rate; **PVRU**: post voiding residual volume of urine; †: independent samples t-test; ¥: Chi-square test; **NS**: not significant at $P > 0.05$; **S**: significant at $P \leq 0.05$

Table 4: Comparison of primary outcome characteristics between middle lobe only TURP and standard whole TURP after twelve month

Characteristic	**Middle lobe TURP** ***n*** **= 30**	**Standard TURP** ***n*** **= 30**	***P***
IPSS	4.80 ±1.77	4.63 ±1.54	0.699 † NS
Q max m/s	24.67 ±4.56	26.13 ±4.98	0.239 † NS
PVRU	90.10 ±26.29	77.33 ±35.60	0.120 † NS
Preservation of ejaculation	19 (63.3 %)	10 (33.3 %)	0.020 ¥ S
ED	9 (30.0 %)	20 (66.7 %)	0.004 ¥ HS

Data were expressed as mean ± standard deviation; IPSS: international prostate symptom score; *n*: number of cases; **Q max**: maximum flow rate; **PVRU**: post voiding residual volume of urine; †: independent samples t-test; ¥: Chi-square test; **NS**: not significant at $P > 0.05$; **S**: significant at $P \leq 0.05$

Discussion

Treatment of patients with benign prostatic hyperplasia is often preserved form men with clinically significant lower urinary tract symptoms. Because of complications associating surgical approach, most patients and their treating doctors prefer initiating medical therapy aiming at controlling these clinical manifestations for the longest possible period and improving the quality of life of those patients. In spite of the substantial proportion of patients who get improvement on medical treatment, significant proportion of patients does not respond adequately to medical intervention making the surgical option mandatory to relief lower urinary tract manifestations. In addition, there exist a proportion of men with benign prostatic hyperplasia who experience failure to respond to medical treatment from the start because of large size of the gland or because of the late presentation. Therefore, eventually, the majority of men with clinically significant lower urinary tract symptoms will undergo the standard whole transurethral prostate resection. The standard whole transurethral removal of the gland is associated with a number of complications such as bleeding and TUR syndrome; however, the loss of antegrade ejaculation is by far the main concern experienced by patients with benign prostatic hyperplasia in our community [16-18]. The attempt for modification for the standard whole transurethral resection of prostate has appeared in the available published urological articles and has been discussed by a number of urologic surgeons [16-18]. Middle lobe TRUP for patients with prominent middle lobe has been found to produce satisfactory results on the long term with respect to comparable relief of lower urinary tract symptoms in addition to the superiority of preservation of adequate sexual activity including preserved antegrade ejaculation [16]. The conventional method of TURP is traditionally carried out with "careful removal of apical tissue around the verumontanum." [14, 19]. Aiming at preservation of antegrade ejaculation, the paracollicular and the situated tissue that is present one cm proximal to the verumontanum must be kept. This is principally reflecting the role of the verumontanum and musculus ejaculatorius in the process of ejaculation [20, 21]. Based on this better awareness of the ejaculation process, new methods in prostate transurethral removal have been developed, and the results were comparable to the traditional TTURP in relieving symptoms in selected patients but have the advantage of preserving adequate sexual activity [14]. Here in the current study, selected patients based on strict inclusion criteria, as stated in section of method, have shown very promising outcomes following middle lobe TURP. In conclusion, middle lobe TURP appears more appropriate for mean < 65 years of age with prominent middle lobe benign prostatic hyperplasia in terms less operative time, less frequency of postoperative erectile dysfunction and preservation of ejaculation in comparison to standard whole TURP.

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