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A COMPARATIVE STUDY BETWEEN TRADITIONAL AND EJACULATION PRESERVING TRANSURETHRAL RESECTION OF PROSTATE

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Abstract

This is to evaluate the efficacy & safety of a modified ejaculation preservation Transurethral Resection of Prostate (epTURP) , in comparison with the traditional technique - Transurethral Resection of Prostate (TURP) .

A prospective controlled clinical interventional study whereby 40 Iraqi male patients scheduled for TURP were randomly assigned into 2 groups; group 1 treated with epTURP, and group 2 treated with TURP.

Pre & post-operative evaluation of the patients included history taking, filling the international prostate symptom score (IPSS), the international index for erectile function (IIEF – 15); questions 9,10,13 & 14, measurement of ejaculate volume, Uroflowmetry (Q-max) & measurement of Post Voiding Residual urine (PVR). Follow up schedule was at 6 weeks & 3 months post-operatively. The Mean age of patients was 59 year, mean prostate volume was 46 ml. Post-operatively 19/22 patients in the epTURP group & 3/18 patients in the TURP group had preserved their antegrade ejaculation, which led to a significant difference between the 2 groups in mean ejaculate volume & IIEF .There was a comparable improvement in post-operative values of IPSS, Q-max & PVR in both groups. Complications were minimal & manageable in both groups.

In Conclusion The epTURP was in our experience a safe & effective technique in preserving antegrade ejaculation & improving urinary outflow in patients with prostate volume approaches 50 ml .

Keywords: Transurethral resection of prostate, ejaculation preservation, uroflowmetry, post voiding residue, ejaculate volume.

Introduction

Benign prostatic hyperplasia (BPH) is one of the most common urological diseases worldwide . Despite the fact of its benign nature , it has been shown to negatively affect the quality of life (QoL), evidenced by bothersome voiding and storage Lower Urinary Tract Symptoms (LUTS) [1,2].

Patients with symptomatic BPH are usually treated by medical therapies, which are effective in alleviating the LUTS in most of the patients, with a low adverse effect profile, especially with the use of the currently available more selective alpha blockers [3]. Nevertheless, there is still some patients who are in need for surgical intervention [4].

Despite continuing development of minimally invasive surgical procedures for BPH, transurethral resection of the prostate (TURP) still remains the commonest surgical treatment for LUTS due to BPH, with the majority of patients reporting normal or improved voiding in long term follow-up [5,6]. The concept of standard TURP is resecting the bladder neck & the prostatic tissues enveloped in the prostatic capsule, while leaving the urethral tissues below the verumontanum [7,8]. Over resection of the bladder neck and prostatic lobes with removal of apical tissue around the verumontanum , with the aim of improving the bladder outflow, has been associated with increasing possibility of many early & late complications (Retrograde ejaculation 65-90% ,Impotence 10% ,Incontinence 2%) as noticed in short & long-term follow-up studies [9,10].

Sexual function, including a normal antegrade ejaculation, is an important determinant of the QoL of male subjects. Losing this function after TURP, especially in relatively young patients (in their fifties & sixties), was always an issue of concern [11,12].

In the last two decades, some surgeons realized this fact & tried to perform modifications in the technique of conventional TURP in the hope of preserving antegrade ejaculation [11,13].

This study was conducted to evaluate the efficacy & safety of the modified ejaculation preservation technique of TURP (epTURP), regarding bladder outflow & preservation of antegrade ejaculation , in a group of Iraqi patients with BPH .

Patients & methods

This is a prospective controlled clinical interventional study conducted through the period October 2017 to October 2019, whereby a group of Iraqi male patients complaining from LUTS due to BPH were included and treated by TURP.

The indications for surgery were: Bothersome LUTS not relieved by life style modifications or medical therapy, recurrent attacks of retention of urine (ROU), high post voiding residual urine(PVR) with recurrent or persistent urinary tract infections & recurrent attacks of hematuria related to benign prostatic enlargement (BPE).

All the included patients were of good health, having a normal sexual relationships with the ability to ejaculate, and willing to preserve antegrade ejaculation after surgery.

Exclusion criteria were neurogenic bladder, neurological diseases affecting the lower urinary tract function, Diabetes mellitus, renal impairment, psychotic disorders, erectile or ejaculatory dysfunction, prostate or bladder cancers, urethral stricture and previous trans urethral surgery.

Informed consent was obtained from all the included patients, following a detailed explanation of the procedure & its possible complications, and they were asked to stop their alpha blocker treatment for 3 - 5 days (for accurate assessment of their ejaculatory function).

Pre- operative evaluation included a detailed general & sexual history, physical examination (including digital rectal examination), urinalysis, renal function tests, random blood sugar, complete blood count, bleeding profile, virology, prostate specific antigen (PSA), collection of a semen sample by masturbation, after 3 days abstinence (to measure the ejaculate volume), uroflowmetry and abdominal ultrasound (mainly to measure the prostate volume & PVR and to detect other urinary pathologies).

All the enrolled patients were also asked to fill the International Prostate Symptom Score (IPSS) & to answer questions 9 & 10 (that represent ejaculatory function) and questions 13 & 14 (that represent the overall sexual satisfaction) of the international index for erectile function (IIEF-15). A score of 0-5 is awarded to each question (15), then patients were randomly assigned into 2 groups; one group treated by the classical, traditional TURP (control group), and the other treated by a modified , ejaculation preservation TURP.

All the operations (of both groups) were done by the same surgical team, under general or spinal anaesthesia, using bipolar or monopolar diathermy , with a 26 Fr. continuous drainage Resectoscope & 30 degree telescope .

Technique of Ejaculation preservation TURP:

The procedure commenced by setting a mark, by the resectoscope loop using the coagulation current, 1 cm proximal to the verumontanum as a guidance. Then complete resection of the middle lobe and lateral lobes proximal to this mark done, with removal of the resected chips and final check for obstruction and to secure hemostasis.

By this technique the preservation of 1 cm of prostate tissue proximal to veromontanum is intended in the hope of preserving the genital sphincter, which should be of value to preserve antegrade ejaculation [11,13,14, 16,17].

Most patients stayed one day in the hospital & the catheter withdrawn 3-5 days post-operatively . All the patients instructed to resume sexual intercourse after 3-4 weeks from surgery.

Follow up assessments were done at 6 weeks & 3 months post-operatively and included: history taking, uroflowmetry, abdominal U/S with measurement of PVR, measurement of the ejaculation volume by collection of semen sample and answering the questions of IPSS & IIEF-15 (questions 9,10,13 & 14).

The primary outcome was the preservation of antegrade ejaculation & its volume , other outcomes were the improvements in urinary flow , evacuation of the bladder & LUTS .

This study was approved by the ethical committee of our hospital & by the scientific council of Iraqi board of urology .

Statistical analysis: Analysis of data was carried out using the available statistical package of SPSS-25 (Statistical Packages for Social Sciences- version 25). Data were presented in simple measures of frequency, percentage, mean, standard deviation, and range (minimum-maximum values). Statistical significance was considered whenever the P value was equal or less than 0.05.

Results

In this study, 40 Iraqi male patients , complaining from bothersome BPH/LUTS, were enrolled, their mean age was 59 year.

After thorough assessment, they were randomly assigned into 2 treatment groups, 18 were treated by traditional TURP, and 22 by a modified ejaculation preservation TURP.

Demographic data of the patients were comparable in both groups, with a mean prostate volume of 46 ml & a PSA level within benign range, as shown in Table 1.

Table 1 (Demographic data of the patients)

	Traditional TURP	Ejaculation Preservation TURP	P value
Age (years)	59.5±5.6 (50-69)	58.4±5.7 (49-68)	0.727
Prostate volume (ml)	46.3±7.8 (30-60)	46.0±7.6 (32-60)	0.924
PSA (ng/dL)	3.2±.7 (1.9-4.5)	2.9±.8 (1.7-4.5)	0.226

-Data were presented as Mean±SD (Range).
*Significant difference between two dependent means using Paired-t-test at 0.05 level.
#Significant difference between two independent means using Students-t-test at 0.05 level.
PSA = prostate specific antigen

The pre-operative urinary outflow parameters were comparable in both groups ; There were 9 patients with ROU in the traditional group versus 12 in the modified group, with obvious high mean PVR, low Q-max & an IPSS within severe range in both groups(Table 2) .

Post-operatively , there were a statistically significant improvements in Q-max, PVR & IPSS in both groups at the 6 weeks assessment . These improvements maintained at the 3 months assessment or even become better as shown in Table 2.

Table 2 (Urinary outflow parameters & IPSS in both groups)

	Traditional TURP	Ejaculation Preservation TURP	P value
Post-void volume (ml): Pre-op	159.7±126.1 (50-540)	201.6±172.0 (55-600)	0.395
-Post-operative 6 weeks	32.8±9.9 (20-50)	43.8±21.0 (15-90)	0.049#
-Post-operative 3 months	26.1±5.6 (15-35)	30.9±17.0 (10-75)	0.265
P value: Preop vs 6 weeks	0.0001*	0.0001*	
Preop vs 3 months	0.0001*	0.0001*	
6 weeks vs 3 months	0.003*	0.0001*	
Q max (ml/Sec): pre-op	9.7±2.2 (5-13)	9.4±2.7 (0-12)	0.656
-Post-operative 6 weeks	15.2±1.7 (11-17)	15.2±1.5 (12-17)	0.937
-Post-operative 3 months	16.4±1.1 (14-18)	16.3±1.6 (13-19)	0.710
P value: Preop vs 6 weeks	0.0001*	0.0001*	
Preop vs 3 months	0.0001*	0.0001*	
6 weeks vs 3 months	0.0001*	0.0001*	
IPSS: Pre-op	26.2±3.3 (19-31)	25.5±3.9 (19-32)	0.566
-Post-operative 6 weeks	14.4±3.1 (8-19)	14.0±3.6 (9-22)	0.655
-Post-operative 3 months	12.8±2.7 (7-17)	12.2±3.3 (7-20)	0.508
P value Preop vs 6 weeks	0.0001*	0.0001*	
Preop vs 3 months	0.0001*	0.0001*	
6 weeks vs 3 months	0.0001*	0.0001*	

-Data were presented as Mean±SD (Range).
*Significant difference between two dependent means using Paired-t-test at 0.05 level.
#Significant difference between two independent means using Students-t-test at 0.05 level.
Q max = maximum flow rate , IPSS = international prostate symptom score

All the included patients; in both groups, had a normal antegrade ejaculation at pre-operative assessment, with comparable ejaculate volume & an IIEF scores above 7 for the 2 studied domains . Post-operatively, 15/18 patient lost their antegrade ejaculation in the traditional group versus 3/22 patient in the modified group (p value 0.0001). This was associated with a statistically significant differences between the 2 groups in the mean ejaculate volume, IIEF 9,10 & IIEF 13, 14 in favor of the modified TURP group that show even better results at the 3 months assessment (Table 3).

Table 3 (Assessment of Ejaculation & sexual satisfaction in both groups)

	Traditional TURP	Ejaculation Preservation TURP	P value
IIEF (Q9 & Q10): Pre-op	7.6±1.0 (6-9)	7.6±.9 (6-9)	0.946
-Post-operative 6 weeks	4.5±.9 (3-6)	6.6±.9 (5-8)	0.0001#
-Post-operative 3 months	4.3±1.1 (3-7)	7.4±1.5 (4-9)	0.0001#
P value: Preop vs 6 weeks	0.0001*	0.0001*	
Preop vs 3 months	0.0001*	0.568	
6 weeks vs 3 months	0.449	0.002*	
IIEF (Q13 & Q14): pre-op	7.8±1.2 (5-9)	7.4±1.0 (6-9)	0.279
-Post-operative 6 weeks	5.8±.9 (4-7)	6.7±.7 (6-8)	0.001#
-Post-operative 3 months	5.2±1.1 (3-7)	7.4±1.2 (4-9)	0.0001#
P value: Preop vs 6 weeks	0.0001*	0.001*	
Preop vs 3 months	0.0001*	-	
6 weeks vs 3 months	0.007*	0.004*	
Ejaculation volume (ml): Pre-op	2.6±.6 (1.5-4.0)	2.5±.7 (1.3-4.0)	0.694
-Post-operative 6 weeks	0.8±.5 (0-1.5)	1.6±.6 (0-2.5)	0.0001#
-Post-operative 3 months	0.6±.7 (0-2.0)	2.0±.9 (0-3.0)	0.0001#
P value Preop vs 6 weeks	0.0001*	0.0001*	
Preop vs 3 months	0.0001*	0.002*	
6 weeks vs 3 months	0.291	0.003*	

-Data were presented as Mean±SD (Range).
*Significant difference between two dependent means using Paired-t-test at 0.05 level.
#Significant difference between two independent means using Students-t-test at 0.05 level.
IIEF = International index for erectile function

Apart from retrograde ejaculation; which occurs in 15 patient in the traditional group versus 3 in the modified group, complications were minimal & manageable in both groups; there was one case of bleeding in the traditional TURP that necessitate blood transfusion & keeping the patient one extra day in the hospital, 2 patients in the modified TURP group presented with relatively higher PVR (55 ml & 60 ml) compared to control group , at the follow up assessments and were instructed to take prophylactic urinary antiseptics & to avoid constipation and one patient in the traditional group complained from some Erectile Dysfunction (ED) that was successfully managed with Tadalafil 5 mg tablets.

Discussion

With the development in life, the job & responsibilities of doctors had changed from merely treating diseases to more & more concern about the quality of life of patients. Patients with BPH always concerned about the adverse effects of treatment, whether medical or surgical, on their sexual performance, that's why medical treatment of BPH witnessed a lot of improvements trying to address this point [4, 18].

All the included patients in this study have voiding problems related to BPH reached to a level that justify surgical treatment, and most of them were from the younger age group of BPH patients, in their fifties & early sixties, and willing to preserve

their ejaculation ability .

According to the current knowledge, antegrade ejaculation, could be maintained during TURP by keeping a sufficient supramontanal prostatic tissue (about 1 cm), the contraction of which, together with that of the prostatic capsule, prevents the ejaculate that reached the inframontanal area of the posterior urethra from ascending up to the bladder during the emission phase [11,13,16,19, 20, 21].

This study is conducted to report our experience in this modified TURP in comparison with the traditional TURP, regarding ejaculation preservation & relieve of Bladder Outlet Obstruction (BOO).

Antegrade ejaculation was preserved in 19/22 patients in the modified TURP which is comparable to other studies [11,14,22,23,24]. This result support the current concept that resection of the bladder neck is not necessarily lead to retrograde ejaculation, while keeping a sufficient apical prostatic tissue just proximal to verumontanum is the beneficial modification, while in the traditional TURP group , only 3 / 18 patients reported a positive antegrade ejaculation, which is a statistically significant difference from the modified TURP group, and that's what happen when the resection extended down to verumontanum (damage of the genital sphincter), which is again comparable to the results of other studies on traditional TURP [9, 10].

Most of the studies used only the IIEF questionnaire to evaluate the sexual / ejaculation function, but in this study we implement the measurement of the ejaculation volume in addition to history taking & using the IIEF-15 in a more precise way by choosing only the ejaculation function domain (questions 9 & 10) and the overall sexual satisfaction domain (questions 13 & 14), which add more objectivity to the collected data, that was obviously noticed in the statistically significant difference in the ejaculate volume & IIEF between the 2 groups. But we should admit that even in the modified TURP group, the post-operative mean ejaculation volume was less than the pre-operative volume, which may be attributed to loss of the prostatic secretion (as part of the ejaculate volume) by the TURP.

Both techniques proved to be efficient in improving the urinary outflow, through a statistically significant improvement in the post-operative levels of IPSS, Q- max and PVR in both groups. This result is in agreement with other studies that stressed on the fact that preserving some of the supra-montanal prostatic tissue doesn't jeopardize the efficiency of the TURP procedure in relieving BOO [8,11,14,22,23,24].

An interesting finding in this study is that we achieved an ejaculation preservation & relieve of urinary obstruction by the modified TURP comparable to what is achieved in other studies in spite of the relatively higher mean prostate volume in our series than in others [11,14, 22], which means that achievement of these good results is possible even when the prostate volume approaches 50 ml, if the technique performed meticulously.

In the current study, we noticed also an improvement in the results from the 6 weeks to the 3 months assessment, which could be due to complete resolution of the procedure-related inflammatory process at the 3 months visit.

Complications were minimal & manageable in both types of TURP , with even better recovery and shorter time for catheter withdrawal in those patients treated with bipolar diathermy in both groups.

Conclusion

The modified technique of preserving some of the supra-montanal prostate tissue during TURP in our experience is a safe & effective technique that lead to significant preservation of antegrade ejaculation parallel to a significant improvement in urinary outflow, even in patients with prostate volume approaches 50 ml.

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