

·Original Article·

Erectile dysfunction after transurethral prostatectomy for lower urinary tract symptoms: results from a center with over 500 patients

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Abstract

Aim: To identify possible risk factors for erectile dysfunction (ED) after transurethral resection of prostate (TURP) for benign prostatic hyperplasia (BPH). **Methods:** Between March 1999 and March 2004, 629 patients underwent TURP in our department for the treatment of symptomatic BPH. All patients underwent transrectal ultrasound examination. In addition, the flow rate, urine residue, International Prostate Symptom Score (IPSS) and quality of life (QOL) were recorded for those who presented without a catheter. Finally, the erectile function of the patient was evaluated according to the International Index of Erectile Function Instrument (IIEF-5) questionnaire. It was determined that ED existed where there was a total score of less than 21. The flow rate, IPSS and QOL assessment were performed at 3 and 6 months post-treatment. The IIEF-5 assessment was repeated at a 6-month follow-up. A logistic regression analysis was used to identify potential risk factors for ED. **Results:** At baseline, 522 (83 %) patients answered the IIEF-5 questionnaire. The mean patient age was (63.7 ± 9.7) years. The ED rate was 65 %. After 6 months, 459 (88 %) out of the 522 patients returned the IIEF questionnaire. The rest of the group was excluded from the statistical analysis. Six months after TURP, the rate of patients reporting ED increased to 77 %. Statistical analysis revealed that the only important factors associated with newly reported ED after TURP were diabetes mellitus ($P = 0.003$, $r = 3.67$) and observed intraoperative capsular perforation ($P = 0.02$, $r = 1.12$). **Conclusion:** The incidence of postoperative, newly reported ED after TURP was 12 %. Risk factors for its occurrence were diabetes mellitus and intraoperative capsular perforation. (*Asian J Androl 2006 Jan; 8: 69-74*)

Keywords: benign prostatic hyperplasia; transurethral resection of prostate; erectile dysfunction

1 Introduction

It is accepted that sexual function is important to the

quality of life (QOL) of individuals. Population surveys have shown high levels of sexual dysfunction in men over the age of 50 years [1, 2]. Recent evidences from both community and clinical trials have suggested a link between lower urinary tract symptoms (LUTS) and sexual dysfunction [3–5]. Transurethral resection of prostate (TURP), the standard surgical therapy for the relief of LUTS, is reported to cause sexual dysfunction as well. According to a systematic review, approximately 75 % of

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sexually active and potent patients experience retrograde ejaculation and over 13 % become impotent after TURP [6]. One important drawback of the studies dealing with sexual dysfunction after TURP is the lack of a standard definition of sexual dysfunction.

The aim of this study was to evaluate the incidence of erectile dysfunction (ED) after TURP in a hospital using the validated International Index of Erectile Function Instrument (IIEF-5) [7]. A second aim was to identify the possible risk factors associated with its occurrence in this particular patient cohort.

2 Material and methods

Between March 1999 and March 2004, 629 patients underwent TURP in our department for the treatment of symptomatic benign prostatic hyperplasia (BPH). Table 1 lists the inclusion and exclusion criteria for treatment.

All patients underwent transrectal ultrasound (TRUS) (Performa, Dornier MedTech, Wessling, Germany). In addition, the flow rate, urine residue, International Prostate Symptom Score (IPSS) and QOL were recorded for those who presented without a catheter. Finally, the erectile function of the patient was evaluated according to the IIEF-5 questionnaire [7]. ED was defined as a total score of less than 21.

The flow rate, IPSS and QOL assessment were performed at 3 and 6 months postoperatively. IIEF-5 assessment was repeated at a 6-month follow-up.

The elaboration of data was accomplished with the Statgraphics Statistical Package (Manugistics, Rockville, MD, USA) [8]. Data were expressed as mean \pm SD. Normality was assessed with the Kolmogorov-Smirnov test. Comparison of the groups was done with paired *t*-test. Correlation was calculated according to Spearman's correlation coefficient. Forward logistic regression analy-

sis was used to identify potential risk factors for ED [9]. $P < 0.05$ was considered statistically significant.

3 Results

At baseline, 522 (83 %) patients answered the IIEF-5 questionnaire. The mean patient age was (63.7 ± 9.7) years. ED was evident in 339 (65 %) patients. There was a significant correlation between age and ED ($P < 0.01$). Patients presenting with ED at baseline had significantly higher symptom scores than those without ED. Table 2 shows a univariate analysis of the risk factors for ED at baseline. Diabetes ($P < 0.001$), coronary heart disease ($P = 0.006$), age ($P < 0.01$), hypertension ($P = 0.02$) and severity of the IPSS ($P = 0.03$) were the most important parameters. Intraoperative capsular perforation occurred in 26 (5 %) patients. Severe hemorrhage requiring blood transfusion was observed in 21 (4 %) patients. TURP syndrome occurred in 11 (2 %) patients. Of the 63 patients who were lost during the 6-month follow-up, 22 (34.9 %) were potent. This finding suggests that the distribution of potent patients in the baseline patient group is almost equal to that of the group that was lost in follow-up.

Mean values in clinical parameters at baseline and at 6 months in patients treated with TURP are presented in Table 3. In this table we separated the patients who did not have a pretreatment indwelling catheter ($n = 366$, 70 %) from those who did have an indwelling catheter due to urinary retention prior to treatment ($n = 156$, 30 %). We evaluated the IIEF data and the other clinical parameters for each of these two groups. As seen in Table 4, preoperative urinary retention (pretreatment catheter) was not related to newly diagnosed postoperative ED. After 6 months, 459 (88 %) out of the 522 patients returned the IIEF questionnaire. The rest were excluded from

Table 1. Patient inclusion and exclusion criteria for transurethral prostatectomy. BPH, benign prostatic hyperplasia; IPSS, International Prostate Symptom Score; Qmax, maximum flow rate; PSA, prostate specific antigen.

Inclusion criteria	Exclusion criteria
Symptomatic BPH	Neurogenic bladder dysfunction and/or sphincter decompensation
Obstruction with or without catheter	Active urinary tract infection
IPSS > 7	Continued wish to father children
Qmax < 15 mL/sec with voiding volume = 150 mL	
PSA = 4 ng/mL and / or negative prostate biopsy	
Complicated BPH	

Table 2. Fisher's exact test of risk factors for preoperative erectile dysfunction (ED) in patients treated with transurethral prostatectomy for obstructive benign prostatic hyperplasia (BPH). ^aRegarding 366 patients without pretreatment catheter.

Risk factor	Preoperative erectile dysfunction		P value
	Yes n = 339 (65 %)	No n = 183 (35 %)	
Coronary heart disease			
Yes	118 (34.8 %)	38 (20.8 %)	0.006
No	221 (65.2 %)	145 (79.2 %)	
Diabetes mellitus			
Yes	43 (12.7 %)	9 (4.9 %)	< 0.001
No	296 (87.3 %)	174 (95.1 %)	
IPSS^a			
Mild symptoms (0 – 7)	36 (10.6 %)	29 (15.8 %)	0.03
Moderate symptoms (8 – 19)	168 (49.6 %)	103 (56.3 %)	
Severe symptoms (20 – 35)	135 (39.8 %)	51 (27.9 %)	
Age			
< 60 years	36 (10.6 %)	88 (48.1 %)	< 0.01
> 60 years	303 (89.4 %)	95 (51.9 %)	
Hypertension			
Yes	136 (40.1 %)	72 (39.3 %)	0.022
No	203 (59.9 %)	111 (60.7 %)	

Table 3. Mean values in clinical parameters at baseline and at 6 months in patients undergoing transurethral prostatectomy.

	Baseline	6 months	P value
	Mean ± SD	Mean ± SD	
Patients without catheter (n = 366)			
International Index of Erectile Function(IIEF)	18.77 ± 4.31	17.82 ± 4.4	0.79
International Prostate Symptom Score(IPSS)	21.1 ± 6.8	6.2 ± 3.8	< 0.001
Peak flow rate (mL/s)	7.3 ± 3.1	18.2 ± 7	< 0.001
Urine residue (mL)	104.2 ± 52.2	33.6 ± 37.2	< 0.01
Quality of life(QOL)	4.4 ± 1.9	1.3 ± 0.9	< 0.001
Prostatic volume (mL)	48.7 ± 17.8	26.4 ± 12.5	< 0.001
Patients with catheter (n = 156)			
International Index of Erectile Function(IIEF)	18.27 ± 5.31	17.1 ± 3.4	0.88
International Prostate Symptom Score(IPSS)		5.8 ± 4.5	
Peak flow rate (mL/s)		14.3 ± 7.8	
Urine residue (mL)		63.1 ± 47.7	
Quality of life(QOL)		1.2 ± 0.8	
Prostatic volume (mL)	49.2 ± 26.4	27.8 ± 23.7	< 0.01

the statistical analysis. At 6 months, 353 (77 %) out of the 459 patients reported ED. There was a 12 % increase in the ED rate. Table 5 presents the distribution of IIEF scores at baseline and at 6 months.

Forward logistic regression analysis revealed that the

only important factors associated with newly reported ED after TURP were diabetes mellitus ($P = 0.003$, $r = 3.67$), and reported intraoperative capsular perforation ($P = 0.02$, $r = 1.12$) (Table 4).

Table 4. Logistic regression analysis of risk factors for postoperative erectile dysfunction in patients with no preoperative erectile dysfunction undergoing transurethral prostatectomy. ^aNecessitating intraoperative or immediate postoperative blood transfusion. df: degree of freedom.

Variable	Score	df	P	r
Age	0.48	1	0.94	0.00
Capsular perforation	4.68	1	P = 0.02	1.12
Diabetes mellitus	12.15	1	P = 0.003	3.67
Coronary heart disease	1.67	1	0.1	0.00
International Prostate Symptom Score	1.20	2	0.54	0.00
Profuse hemorrhage ^a	2.28	1	0.08	0.00
Resected tissue	2.11	1	0.09	0.00
Hypertension	0.31	1	0.57	0.00
Pretreatment catheter	1.13	1	0.28	0.00

Table 5. Distribution of International Index of Erectile Function Instrument (IIEF-5) scores at baseline and at 6 months in patients undergoing transurethral prostatectomy. ED: erectile dysfunction.

IIEF-5 score	Number of patients at baseline (%)	Number of patients at 6 months (%)
5 – 10 (severe ED)	31 (5.9 %)	36 (7.8 %)
11 – 15 (moderate ED)	36 (6.9 %)	37 (8 %)
16 – 20 (mild ED)	272 (52.1 %)	280 (61 %)
21 – 25 (normal)	183 (35.1 %)	106 (23.2 %)
Total	522	459

4 Discussion

BPH is a common condition in aging men and is associated with a range of sexual dysfunction. Treatments for BPH are also associated with ED and sexual dysfunction. Ejaculatory dysfunction is the most common problem associated with both medical and surgical treatment. We present our experiences of treating 522 patients with TURP over a time span of 5 years; 156 of these patients had a pretreatment catheter.

The incidence of ED after TURP for BPH is still debated. It has been reported to occur in between 4 % and 35 % of patients [10–12] and to be associated with age or a pre-existing ED [12, 13]. Various suggestions have been made as to the origin of this condition (e.g. cavernous nerve damage [12, 14], fibrosis and thrombosis of the cavernous arteries [12], or psychological changes due to ejaculatory failure or urethral sphincter insufficiency [11]), but no conclusive determination has been made.

In our study, diabetes mellitus and reported intraoperative capsular perforation were the only significant risk factors for newly observed postoperative ED. Thirty

percent of the patients with diabetes mellitus developed postoperative ED, while 62 % of the patients with intraoperative capsular perforation reported ED 6 months after the operation. Capsular perforation was also a risk factor for impaired postoperative erectile function in the study of Tscholl *et al.* [12]. This could also cause a direct injury to the cavernous nerves, which run a few millimeters from the prostatic capsule. Tscholl *et al.* [12] reported that a small adenoma was a risk factor for postoperative ED probably because of a higher risk of capsular perforation. Conversely, in cases of large adenoma, the cavernous nerves are more protected because of their distance from the site of resection. The negative effect of perioperative capsular perforations adjacent to the neurovascular bundles on the potency after TURP was advocated also in the studies of Hanbury and Sethia [13] and Bieri *et al.* [14]; in these studies, the overall rate of newly diagnosed postoperative ED was 17.5 % and 32.5 %, respectively.

It is not surprising that the ED correlates so strongly with the capsular penetration. In a study [15] on transurethral resection of adenoma of the posterior urethra

in 131 young males, no ED or any sexual dysfunction (e.g. hemospermia and retrograde ejaculation) was reported postoperatively, because only the tumor of the posterior urethra was resected and the prostate was left intact.

Diabetes mellitus was also a significant risk factor for postoperative ED in the study by Taher [16], who made a link between this and the higher susceptibility of the cavernous nerves of patients to damage from heat, contributed by chronic hyperglycemia. In that study, the rate of newly diagnosed postoperative ED was 14 %.

There are more studies that have found other risk factors for postoperative ED in patients undergoing transurethral resection for BPH. For example, the association between age and postoperative ED was reported by Tscholl *et al.* [12]. In 8.3 % of the patients newly diagnosed, postoperative ED was observed, and being aged more than 65 years was one of the factors associated with its occurrence. Perera and Hill [17] observed a postoperative newly diagnosed ED rate of 17.3 % in their study of 253 patients treated with TURP. Significant risk factors for its occurrence were presentation with acute retention and the development of profuse primary hemorrhage.

Finally, Zohar *et al.* [18], in an earlier study, reported that patients who became impotent following prostate surgery had a higher level of anxiety, and that those without extensive preoperative counseling (including information on sexual function) were significantly more likely to complain of impotence after TURP.

To our knowledge, this is the largest prospective study evaluating risk factors for the occurrence of ED after transurethral resection for the treatment of obstructive BPH in patients with and without pretreatment catheters. Patients, reporting ED for the first time after the operation, according to a validated questionnaire [7], did not differ from those not reporting ED with respect to age, prostate mass and pretreatment symptom scores. Also, the two groups did not differ in the amount of tissue they had resected. The only parameters that significantly differed between the two groups were the rate of patients with diabetes, the rate of reported capsular perforation and the rate of profuse hemorrhage necessitating transfusion ($P < 0.01$ for all three parameters). The forward logistic regression model considered diabetes mellitus and the presence of intraoperative capsular perforation as significant independent risk factors for presentation of a new postoperative ED.

The incidence of preoperative ED in patients with

obstructive BPH was 65 %. In our study population, using the strict criteria of a validated questionnaire [7], the incidence of the preoperative ED of 65 % appeared quite high. However, this is not a normal male population but patients with lower urinary tract symptoms, in whom a TURP was indicated. Furthermore, 30 % of the patients had an indwelling catheter because of acute urinary retention for a mean time of 6.8 (range: 1–65) days. Additionally, our pre-TURP ED rates are lower than those reported by other authors [19] (65 % *vs.* 70 %) who evaluated an analogous patient population. As presented in Table 5, only 67 (13 %) patients had moderate-to-severe ED; the majority of the patients ($n = 272$, 52 %) had mild ED. Six months after TURP, the rate of patients reporting ED increased to 77 %. Risk factors associated with this increase were diabetes mellitus and intraoperative capsular perforation.

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