

# Cystostomy-free open suprapubic transvesical prostatectomy: Is it a safe method?

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## Abstract

**Aim:** To compare open suprapubic transvesical prostatectomy (OSP) without insertion of suprapubic cystostomy, OSP with insertion of cystostomy, and transurethral resection of the prostate (TURP).

**Patients and Methods:** A total of 104 patients with an indication for prostatectomy were retrospectively assigned to TURP (group 1), OSP with cystostomy (group 2), and OSP without cystostomy (group 3). They were evaluated for length of the operation, length of hospital stay, post-operative complications, hemoglobin drop, changes of blood pressure, and intraoperative blood loss.

**Results:** Mean age was  $67.2 \pm 8.7$  in group 1,  $73.3 \pm 8.4$  in group 2, and  $74.0 \pm 5.7$  in group 3. Prostatic volume was  $35.9 \pm 13.8$ ,  $74.1 \pm 33.8$ , and  $74.3 \pm 31.8$  in groups 1, 2, and 3, respectively. There was no significant difference in prostatic volume between groups 2 and 3 ( $P = 0.99$ ), but in group 1 it was lesser than groups 2 and 3 ( $P = 0.00$ ). Length of the operation was  $1.2 \pm 0.2$  in group 3 and  $1.1 \pm 0.2$  in group 2, without a significant difference ( $P = 0.45$ ). Length of hospital stay in group 3 ( $2.3 \pm 0.4$  days) was lesser than that in group 2 ( $2.6 \pm 0.7$ ) ( $P = 0.01$ ). The amount of hemoglobin drop was  $1.1 \pm 0.9$  in group 1,  $1.1 \pm 0.7$  in group 2, and  $1.4 \pm 0.91$  in group 3 without a significant difference between all groups. The amount of bleeding during operation was  $173 \pm 103$  in group 2 and  $161 \pm 78$  in group 3 ( $P = 0.98$ ).

**Conclusion:** OSP without insertion of cystostomy tube is a relatively safe method; however, larger studies are needed. It is also comparable to TURP in terms of postoperative efficacy and complications.

**Key Words:** Cystostomy, prostate, prostatectomy, transurethral resection of the prostate

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## INTRODUCTION

Nowadays open suprapubic prostatectomy (OSP) is rarely performed because of advances in different types of minimally invasive techniques. Nevertheless, some urologists are interested in doing OSP.<sup>[1-3]</sup>

It is needed to retain open prostate surgery as a part of education for urology residents. Tubaro and Nunzio have stated that decreasing the number of open surgery of the prostate has some problems to maintain postgraduate curriculum.<sup>[4-6]</sup>

Surgeons have tried to modify these surgeries in different routes.<sup>[7-11]</sup> The rationale to leave a cystostomy is the possibility of clot retention, or a possible postoperative urinary retention after Foley removal.

## MATERIALS AND METHODS

This study was conducted from August 2008 to January 2010. Considering  $\alpha=0.05$  and power 80%, the sample size was

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97 patients. After approval of Ethics Committee of Jahrom University of Medical Sciences and signed informed consent forms for prostatectomy and any expected complication, the patients were scheduled for operation. Predictable amount of blood in the form of packed cell was prepared.

Laboratory tests and paraclinic work up were requested according to classic protocols. Those include blood urea nitrogen (BUN), creatinine, sodium, potassium, complete blood count, urine analysis, fasting blood glucose, prostatic specific antigen and coagulation tests. A generalized body examination, and digital rectal examination (DRE) were done for all patients. Urine culture, urinary tract sonography, and urodynamic evaluation were taken as needed. All the patients underwent anesthesiology consultation prior to surgery. If there was any doubt about their cardiopulmonary status, a consultation was made. Any anticoagulant was discontinued 5 to 10 days prior to the surgery. Prostatectomy was performed in an elective setting. Patients who had a urethral catheter or gross hematuria were in priority for surgery. Indication for surgery was one or more of the usual indications of prostatectomy. The type of surgery (OSP versus TURP) was selected by doing a pan urethrocystoscopy and DRE just before the operation at the same setting. In this selection, sonographic and DRE criteria were added as well. The main criteria that determined the type of the surgery was prostate size.

Prostates less than 60 grams were an indication for TURP and those more than 75 grams were indicative of performing OSP, and between these two limits, decision was made according to other factors and also surgeon preference. Of course, other factors such as patients' legs, concomitant bladder pathologies (e.g. diverticulum, stone, etc.), and urethral strictures were considered in selecting the surgery type. The first dose of prophylactic antibiotic was given prior to incision. For OSP, the patients were placed in the supine position and after a meticulous preparation, under general, spinal, or epidural anesthesia prevesical space of Retzius was entered via a low-midline or pfannenstiel's incision. Detrusor muscle was incised with electrocautery and the bladder mucosa was opened with blunt entrance of a clamp. After an incision on the prostate-trigonal junction or beneath the middle lobe of the prostate, it was separated from surgical capsule using sharp dissection of metzenbaum scissor and blunt dissection of the index finger.

A French 22-24 three-way silicon Foley was inserted immediately after enucleation and put on gentle traction until cessation of bleeding. Insertion of cystostomy tube had been planned randomly prior to surgery. During the surgery, we faced two cases of very huge prostates, (250 and 350 grams) that needed impaction of prostatic space with sponge, so they were excluded from the study. A mushroom self-retaining catheter French 24-28 was chosen as cystostomy.

A suprapubic nelaton catheter or a penrose was inserted as drainage of Retzius space. Layers were closed in a routine fashion and bladder irrigation was continued using normal saline (0.9% NaCl in water) for at least 24 hours.

In the case of OSP with cystostomy, irrigation was entered via the larger lumen of three-way Foley and drained via cystostomy tube. In the OSP without cystostomy, irrigation was started like TURP via the Foley catheter. Postoperative intravenous fluid was similar in all patients (3000 ml of 33.3% Dextrose 5% +66.6% saline 0.9% called 1/3-2/3 solution, for 24 hours).

Intraoperative blood loss was estimated using the weight of sponges and net blood within the suction drain. Whole blood loss was also estimated using hemoglobin drop before and after the operation. Length of operation, length of hospital stay, mean blood pressure change, and postoperative short-term complications were the other variables. TURP was performed using 24-Fr monopolar continuous flow resectoscope (Richard Wolf resectoscope, wire loop, Germany) starting at 9-12 o'clock position of the prostatic lobes and terminating at 3-6 o'clock position. Patients who underwent TURP were included in this study for comparison with cystostomy-free OSP. Internal Foley was removed between 3 and 7 days postoperatively, according to patients' condition. In cases of OSP with cystostomy we removed internal Foley at first, and then we clamped the cystostomy. If no problem was seen, like urinary retention, incontinence or bleeding cystostomy was removed 2 days later. Patients with any coagulation disorder, chronic uremia and prostates more than 200 grams were decided to exclude from the study. Statistical analysis was done using one-way ANOVA test (*post hoc* test of Tukey) in SPSS software, version 16. A *P* value less than 0.05 was considered significant.

## RESULTS

A total of 106 patients were entered in this study. Two of them were excluded due to very huge prostates and need for prostatic fossa impaction by sponge. Finally, 47 cases of TURP (group I), 30 cases of OSP with cystostomy (group II), and 27 cases of cystostomy-free OSP were included. Mean age of the patients was  $67.2 \pm 8.7$  in group I,  $73.3 \pm 8.4$  in group 2, and  $74 \pm 5.7$  in group 3, with a significant statistical difference between groups I and 3, but no differences between groups 2 and 3 ( $P = 0.002$  and  $0.94$ , respectively).

There were a statistically significant differences between groups I and 3 as to the prostatic volume, but there was no differences between groups 2 and 3 ( $P$  value =  $0.000$  and  $0.99$ , respectively).

As shown in Table I, a comparison was made between groups I and 3, because of the tubeless nature of the surgery in group 3 and its similarity to group I (TURP).

**Table 1: Characteristics and outcomes for the patients in the three groups undergoing different methods of prostatectomy**

	Mean±SD (range)		P value	Mean±SD (range)		P value
	TURP*	OSPS**		OSPC***	OSPS	
Age	67.2±8.7 (45-82)	74.0±5.7 (60-83)	0.002	73.3±8.4 (55-95)	74.0±5.7 (60-83)	0.94
Prostate volume (ml)	35.9±13 (10-67)	874.3±31.8 (30-152)	0.000	74.1±33 (35-190)	874.3±31.8 (30-152)	0.99
Length of hospital stay (days)	2±0.2 (1-3)	2.3±0.4 (2-3)	0.43	2.6±0.7 (2-5)	2.3±0.4 (2-3)	0.001
Length of the operation (hours)	1.1±0.1 (1-1.3)	1.2±0.2 (1-2)	0.15	1.1±0.2 (1-2)	1.2±0.2 (1-2)	0.45
Bleeding during operation (months)	-	161±78 (100-250)	-	173±103 (150-350)	161±78 (100-250)	0.98
Hemoglobin drop (mg/dl)	1.1±0.9 (0.9-3.5)	1.4±0.9 (0-3.8)	0.24	1.1±0.7 (0-2.6)	1.4±0.9 (0-3.8)	0.45
Change in mean blood pressure	-0.3±1.3 [(-3.3)-(+3.7)]	-0.08±1 [(-1.8)-(+2.4)]	0.74	-0.2±1.2 [(-3.8)-(-2.3)]	-0.08±1 [(-1.8)-(+2.4)]	0.82

\*TURP: Transurethral resection of the prostate, \*\*OSPS: Open suprapubic prostatectomy without cystostomy, \*\*\*OSPC: Open suprapubic prostatectomy with cystostomy, SD: Standard deviation

However, groups I and 2 weren't compared, because a comparison between these two types of surgeries has been done in large number of studies. Groups 2 and 3 also were compared, because the main objective of this study is these two groups. You can see in Table I that no statistical difference is seen in the length of hospital stay, length of the operation, hemoglobin drop, bleeding during operation and mean blood pressure between groups I and 3 and between groups 2 and 3 (all *P* values were more than 0.05).

According to the aim of this study, the follow up was until full recovery of patients. The most complication after operation in group 3 was wound infection (11.1%), and in group 2 it was excessive bleeding (bleeding during or after the operation, which needs blood transfusion) and leakage from the site of cystostomy removal (each one 3.3%) [Table 2].

## DISCUSSION

According to Suer *et al.*, OSP is still a feasible treatment in special cases such as large prostates or patients with bladder pathologies. They reported 4-14 days post-operation hospital stay and 12.7% transfusion rate. Moreover, Moslemi and his colleagues evaluated the importance aspects of not using a cystostomy with no suturing of the bladder neck and concluded that the mentioned modification decreases the convalescence period and hospital stay. Also, they mentioned that complication rate in this method is not more than the standard method of using suprapubic bladder drainage and suturing of the bladder neck.<sup>[12,13]</sup>

In another study conducted by Shirazi *et al.*, open prostatectomy using bladder neck stitches versus only catheter traction were compared and a superiority for traction of Foley catheter in terms of operative time, intraoperative blood loss, and hemoglobin drop was found. In that study, they concluded that only hospital stay was significantly lower with the suture of the bladder neck.<sup>[14]</sup>

A team of general surgeons have done open prostatectomy in Kenya without continuous bladder irrigation after a modified Malement stitch and they have reported lesser bill and shorter

**Table 2: Postoperative complications of different methods of prostatectomy according to modified Clavien classification**

	Group I* (n=47) (%)	Group II** (n=30) (%)	Group III*** (n=27) (%)	Total (n=104) (%)
Grade 2 <sup>¶</sup>	0	1 (3.3)	1 (3.7)	2 (1.9)
Excessive bleeding <sup>¶¶</sup>	0	1 (3.3)	0	1 (0.9)
Cardiac arrhythmia	0	0	1 (3.7)	1 (0.9)
Grade 3a	6 (12.7)	4 (13.3)	4 (14.8)	14 (13.4)
Urethral stricture	4 (8.5)	0	0	4 (3.8)
Leakage from cystostomy site	0	1 (3.3)	0	1 (0.9)
Wound infection	0	0	3 (11.1)	3 (2.8)
Clot retention	2 (4.2)	3 (10)	1 (3.7)	6 (5.7)
Grade 5	0	2 (6.6)	0	2 (1.9)
Death <sup>§</sup>	0	2 (6.6)	0	2 (1.9)
Total	6 (12.7)	7 (23.3)	5 (18.5)	18 (17.3)

<sup>¶</sup>Modified clavien classification, <sup>¶¶</sup>Bleeding during or after the operation, which needs blood transfusion, \*Transurethral Resection of the Prostate, \*\*Open prostatectomy with Insertion of Cystostomy, \*\*\*Open prostatectomy without Insertion of Cystostomy, <sup>§</sup>Due to myocardial infarction

duration of hospital stay, but they reported no increase in complication rate. As you know this is wonderful to perform any type of prostatectomy without bladder irrigation.<sup>[15]</sup>

Another small study by Okorie *et al.* compared OSP with and without postoperative continuous bladder irrigation. They used a modified bladder neck stitch technique consisting of a near circumferential suture method from I to II o'clock position and some vertical sutures at 12 o'clock position. Surprisingly, they found a lesser clot retention rate with their modification, but they concluded that other complications are comparable regarding the two methods.<sup>[16]</sup>

In a population-based study in Canada, the authors found no better operative results for TURP. They showed that complications and mortality of TURP are similar to or higher than open surgeries. Also, according to this large study, the chance of prostate re-growth and urethral stricture was considerably higher after TURP. Many recent and previous studies have reported similar results in this regard.<sup>[17-23]</sup>

In a study conducted in 1990, Serretta *et al.* stated that any comparison of TURP with OSP as to complications is worthless. They concluded that even when OSP is performed

in the best centers, it shows more significant early and late complication rates.<sup>[24]</sup>

In the present study you can see some considerable results, but sometimes you face some antonym outcomes. The main characteristic of our study is supporting OSP without cystostomy as a safe method, as you view clearly in the result section. Complication rate and length of hospital stay, even in the second group (OSP with cystostomy), are lesser than those of Suer's study.

We decided to delete the suprapubic tube only. It was thought that elimination of the bladder neck stitches besides deletion of cystostomy tube as you saw in Moslemi *et al.* may be harmful for patients. We have done these two modifications in two separate studies. Previous study was conducted in 2009.

The current study confirms the results of the Canadians study, indicating comparable complication rate and effectiveness of OSP and TURP. Unlike Serretta and his colleagues, this study showed that OSP is still a helpful surgery even in not advanced centers.

According to the present study, almost all variables are comparable between the two groups of OSP. As you see, only the length of postoperative hospital stay is significantly lesser in the third group (OSP without cystostomy).

We expected that bleeding during operation and also time of the operation in group III lessens but surprisingly these two measures showed no significant difference. Of course, no difference of other variables between these two groups corroborates the OSP without the cystostomy method.

As stated before, the most complication in group III was wound infection. After scrutiny, we found that in all of these cases no drainage for Retzius space was used (Reasons for this decision was the surgeon's confidence of a clear surgical field and also no leakage).

The most important complications in group II were bleeding leading to transfusion, leakage from cystostomy removal site, and death. Specially, the first two complications can be overcome by elimination of cystostomy tube. If other studies prove lesser operation time in addition to lesser hospital stay (as you see in the present study), considerable economic benefits are expected.

The authors also compared mean blood pressures and they found no significant changes. Of course, in all groups mean blood pressure change was negative and standard deviation was more than the mean change. It can happen due to the great change in blood pressure after operation and also due to some

factors other than operation. We also decided to compare TURP with OSP without cystostomy. Surprisingly, despite the significant difference between the prostate volume and the patients' age in these two groups, none of other variables had a significant difference. This may help the surgeons who have tendency toward OPS instead of TURP in a borderline setting. They can liken the open surgery to a close surgery by eliminating the patient's tubes. In this study, OSP with cystostomy wasn't compared to TURP, because this work has been done in many cases and is outside of the objectives of this study.

The limitations for this study are short follow up and low sample size. Also, prostatic-specific antigen was neglected to be added to the variables and return to all patients or their charts was difficult for us.

## CONCLUSIONS

OSP without a suprapubic cystostomy tube can be considered as a safe method as compared to OSP with cystostomy. Also, this modification is helpful in a borderline setting when a surgeon decides to perform OSP versus TURP.

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