The Feasibility of Open Prostatectomy in Patients with Previous Prostate Surgery

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Purpose: Benign prostatic hyperplasia (BPH) is one of the most common problems in elderly men. Transurethral resection of the prostate (TURP) can be performed for most patients who need re-do prostate surgery, but open prostatectomy should be considered in patients with prostate size larger than 70 grams. This study assessed the feasibility of open prostatectomy (OP) after previous TURP in patients whose prostate size was larger than 70 grams.

Materials and Methods: We subdivided patients into two groups: group 1 included patients who had a history of prostate surgery presented with severe voiding symptoms and a large prostate (>70 gram). Patients who were candidate for open simple prostatectomy without a history of prostate surgery were allocated to group 2.

Results: Between June 2007 and April 2018, 2700 patients underwent TURP or open prostatectomy in our department. 152 of 2700 patients came to us because of severe voiding symptoms after previous prostate surgery, but only 30 patients met the criteria to be enrolled in this study. Perioperative complication (capsular perforation) occurred in 4 (13.3%) patients in group 1 whereas none of the patients in the group 2 had capsular perforation. Hemoglobin drop in group 1 was not significantly different from patients in group 2. The rate of blood transfusion did not differ between the groups (2 [6.6%] patients in group 1 and 41 (5.6%) patients in group 2). After 6-12 months, re-operation rate because of urethral/bladder neck stricture was done in 10 (30%) patients in group 1 and 15 (2%) patients in group 2 ($p < 0.05$). Four (13.3%) patients in group 1 complained of urinary leakage (more than one pad per day) 6 months after the operation whereas 5 patients in group 2 used more than one pad per day (0.7%) ($p > 0.05$). Hospital stay was slightly longer in patients in group 1. Six months after the operation, the patients' quality of life was better in group 2 compared with group 1 ($p < 0.05$).

Conclusion: Open simple prostatectomy was a feasible procedure in patients with large prostate after previous TURP, but it was associated with more complications in the long term.

Keywords: prostatectomy; reoperation; transurethral prostate resection of the prostate

INTRODUCTION

Benign prostatic hyperplasia (BPH) is a common problem in elderly men[(1)]. Open prostatectomy (OP) and transurethral resection of the prostate (TURP) are common procedures for removing the prostate in patients with BPH. Indications for BPH surgery include: refractory urinary retention, overflow incontinence, recurrent urinary tract infections, bladder stones or gross hematuria due to BPH[(2)].

TURP is considered as a gold standard treatment in patients whose prostates are smaller than 70-80 grams[(3,4)]. Its efficacy decreases in patients whose prostates are large[(5)]. Therefore, European and American urology guidelines recommend considering open prostatectomy in patients whose prostates are large (www.EAU.org, www.AUA.org). Moreover, OP is still being performed for patients in many developing countries[(6)]. Compared with OP, robotic prostatectomy, is associated with equivalent functional outcomes, but a significant reduction in the transfusion rate and a decreased hospital stay has been reported[(7)]. Given that we do not have a robotic system in our country; we prefer to perform open simple prostatectomy in patients with a large prostate.

The retreatment rate is the most important factor that should be considered in the terms of long-term efficacy [(8)]. Re-do surgery rate was 12.7% for TURP and 8.8% for OP during 8 years[(8)]. The re-TURP rate after primary TURP was 8.3% whereas it was 4.3% after open prostatectomy[(9)]. Given that more extensive prostate tissue is

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Table 1. Data of patients before surgery

variable	OP patients without history of surgery	OP with history of TURP	*P* value
Age, years	67 ± 6.2	75.2 ± 7.2	0.21
Prostate size in ultrasonography	85 ± 12	79 ± 8	0.54
IPSS	26.2 ± 6.1	25.2 ± 5.2	0.86
Peak flow rate, ml/s	6 (0 to 8)	7 (0 to 9)	0.75
PSA (mg/dl)	3.4 ± 1.2	2.7 ± 1.4	0.32

OP: open prostatectomy; TURP: transurethral resection of the prostate, IPSS: international prostate symptom score, PSA: prostate specific antigen

removed during OP, the rate of repeat prostatectomy after TURP is more than that expected after OP[10]. In the terms of cost, the benefit of TURP overbalanced five years after the operation that because of higher reoperation rate in patients with TURP[11].
In this study, we assess the feasibility of open simple prostatectomy in patients who need re-intervention after previous TURP.

MATERIALS AND METHODS

Between June 2007 and April 2018, 2700 patients underwent TURP or open prostatectomy in our department. We included patients whose prostates size were larger than 70 grams and complained of voiding symptoms, were unpleased with medical treatment, and had a history of TURP. Patients with suspicious digital rectal examination and those with pathology report indicated complications other than BPH were excluded from the study. We excluded patients with urethral/bladder neck stricture. The study was approved by the ethical committee of Shahid Beheshti University of Medical sciences (IR.SBMU.RETECH.REC.1400.563), and informed consent was sought from all patients.
We subdivided patients into two groups: group one included patients with severe voiding symptoms who had a history of prostate surgery, outflow obstruction was reported by UDS (urodynamic study), prostate larger than 70 grams was reported by abdominal ultrasonography, and urethral stricture was ruled out by cystoscopy. 30 patients were in group 1.
Patients who had a history of severe urinary symptoms and large prostate, and they did not have a history of prostate surgery were enrolled in group 2 (n=720 patients).
Indications for open prostatectomy included: lower urinary tract symptoms despite maximal medical therapy, frequent urinary tract infections, recurrent hematuria due to BPH, uremia, and urinary retention more than one episode.
History taking and physical examination including digital rectal examination were done in the urology department. Serum level of creatinine, prostate specific antigen (PSA), urine analysis and culture were checked. Ultrasonography of the kidneys, the bladder, and the prostate were also done. After that, cystoscopy was scheduled to rule out urethral stenosis. Patients with high serum level of PSA underwent trans-rectal ultrasound guided biopsy of the prostate. Urodynamic study was done to prove bladder outlet obstruction. Open trans-vesical prostatectomy was performed by two senior urology residents.
When symptom scores improved and were more than 5 points from its baseline, it is considered as IPSS improvement.
This was a retrospective and cross-sectional study. Complications such as surgical site infection and incontinence, international prostate symptom score (IPSS), patients' quality of life, and the peak flow rate (Qmax) were recorded. The patients' quality of life was assessed by the Quality of life (QOL) questionnaire (12). The Institutional Review Board of the Department of Urology and the Ethics Committee of Shahid Beheshti University of Medical Sciences approved the study (code: SBMU.RETECH.REC.1400.563).

Statistical analysis

Statistical analysis was done by SPSS software (Statistical Package for the Social Science, version 16.0, Chicago, Illinois, USA). Categorical variables were analyzed by Chi-square or Fisher's exact tests as appropriated. Quantitative variables were analyzed by t test or Mann-Whitney test. No subgroup analysis was planned. Two-sided P values less than 0.05 were considered statistically significant.

RESULTS

Between June 2007 and April 2018, 2700 patients un-

Table 2. Data of patients during or after surgery

variable	OP patients without history of surgery	OP with history of TURP	*P* value
Anesthesia: spinal /general	670/50	28/2	0.31
Blood transfusion	41 (5.7 %)	2 (6.66%)	0.13
Postoperative fever	31 (4.3%)	2 (6.66%)	0.13
Time to catheter removal, days	7 (5 to 10)	9(7 to 12)	0.07
Incontinent patients six months after surgery	5 (0.69%)	4 (13.3%)	0.032
UTI (epididymitis, cystitis)	60 (8.3%)	3(10%)	0.31
IPSS after surgery	5.1±2.2	4.2±2.1	0.43
Mean QOL score at 6-12 months	24.2±2.3	44.3±3.4	0.01

OP: open prostatectomy, TURP: transurethral resection of the prostate, UTI: urinary tract infection, IPSS: international prostate symptom score, QOL: quality of life. Data are presented as N, mean ± SD, or median.

derwent Monopolar TURP or open prostatectomy in our department. 720 patients underwent OP without a history of TURP. 152 (5.6%) patients who had undergone prostate surgery came to us because of voiding symptoms, and urethral/ bladder neck stricture was ruled out. Most of them underwent TURP, but OP was performed for 30 patients who had a large prostate. The mean±SD duration from the time of the previous transurethral resection of the prostate (TURP) to the time of OP was 36±5 months. Patients' demographic characteristics before the operation are shown in **Table 1**. American Society of Anesthesiology risk score categories 1, 2, and 3 were observed in 2, 21, 7 patients in group 1 and 60, 504, 156 patients in the group 2.

Perioperative and late postoperative data is shown in Table 2. Perioperative complications (capsular perforation) occurred in 4 (13.3%) patients in group 1; however, none of the patients in group 2 had capsular perforation. In three cases, we were able to repair the perforation, and the suprapubic catheter was inserted for one week but the cystostomy catheter was kept for three weeks in one patient. Difficult enucleation was reported in 12 (40%) patients in group 1 and 10 (1.3%) patients in group 2 ($p < 0.05$). Early postoperative complications (during hospitalization) were observed in 3 (10%) patients in group 1 (urinary leak in two patients and gastrointestinal bleeding in one patient) whereas 20 (2.7%) patients in group 2 had urinary leak ($p < 0.05$). One patient in group 1 with an anesthesiology risk score of 3 experienced myocardial infarction two days after surgery. Hemoglobin drop was not significantly different between the groups two days after surgery, and the rate of blood transfusion was not significantly different (two [6.6%] patients in group one and 41 [5.6%] patients in group two).

Six months after surgery, urethral/bladder neck stricture was reported in 10 (30%) patients in group one and 15 (2%) patients in group 2 ($p<0.05$). Urinary incontinence was observed in 8 (26.6%) patients in group 1 and 21 (2.9%) patients in group 2 after surgery ($p < 0.05$). However, six months after surgery, 4 (13.3%) patients of the group 1 complained of urinary leakage more than one pad per day whereas 5 (0.7%) patients of group 2 complained of urinary leakage more than one pad per day ($p > 0.05$).

After 6-12 months, re-operation rate due to urethral/ bladder neck stricture was done in 10 (30%) patients of the group 1 and 15 (2%) patients of group 2 ($p < 0.05$). The patients in group 1 compared to the patients in group 2 needed longer hospitalization. The Patients' quality of life in group 2 was significantly better than the patients of group 2, 6-12 months after the operation ($p < 0.05$).

DISCUSSION

To date, little information has been published about the surgical and functional outcome of patients who underwent open prostatectomy after previous TURP. Transurethral resection of the prostate has been considered as the standard treatment for prostates less than 70 to 80 grams[3,4,13]. Although OP is associated with more morbidity[14], it provides more IPSS and Qmax improvement[14], less re-operation rate[15], and less dysuria[16]. Re-TURP should be considered in patients who need prostate surgery after previous TURP, but its results are disappointing in patients who have large prostate [9,14].

Several minimally invasive surgeries such as holmium laser enucleation of the prostate (HoLEP) has been described as feasible alternatives to open simple prostatectomy, and are is associated with excellent long-term efficacy[17-19] and should be considered in patients with previous prostate surgery, but its steep learning curve and cost are reasons for not using HoLEP in the world [20,21]. 1.1% of patients who had undergone HoLEP needed re-do HoLEP, which is comparable to that of OP[22]. Secondary-HoLEP procedure seems to be safe and technically feasible with comparable functional outcomes as those of primary-HoLEP[22], but its cost has limited its wide implementation in our country.

Semmens and colleagues analyzed a Western Australian database of 19,598 men who underwent surgery during 1980-1995[23]. After 8 years, the re-TURP rate was 6.6% for primary TURP vs 3.3% for OP[23]. Reoperation rate in our study was about 6% that was comparable with other studies[23]. In this study, prostate size larger than 60 gr despite previous TURP indicated that primary prostate size must be large, and previous TURP was incomplete, so adenoma left in prostatic fossa began to grow slowly afterwards.

OP in the setting of previous prostate surgery is a feasible procedure, but it is associated with a higher complication rate such as difficult enucleation and capsular perforation. In the long term, most of our patients are pleased with the results of prostatectomy; however, some patients suffered from frustrating complications such as urinary incontinence and urethral stricture more than usual.

Our study showed that hospital stay in patients with previous TURP was longer, and immediate and late postoperative complication of OP after previous TURP was significantly higher compared with OP in patients without previous prostate surgery.

The anatomy of patients after TURP is technically difficult, and identification of the plane between prostate capsule and adenoma is fairly difficult[14,24]. Therefore, OP in patients with a history of TURP should be done by an experienced urologist, and it is associated with increased complications such as capsular perforation.

Re-TURP and HoLEP are alternative options for patients who develop obstructive symptom due to regrowth of prostate adenoma after previous prostate surgery[23], but the results of TURP in patients with large prostate seem to be less successful than OP[14]; on the other hand, the cost of HOLEP limited its wide implementation in our country. Our study showed that OP was a feasible option in patients with large prostate after previous TURP. Further study is necessary to compare the functional outcome between TURP and open simple prostatectomy in patients who present with severe LUTS and large prostate after TURP.

It seems that performing open simple prostatectomy is more logical in patients who have large prostate size because it is possible that TURP ends in incomplete prostate resection, but our study cannot determine the prostate size cut-off to perform open simple prostatectomy. Unfortunately, we do not have robot in our country; therefore, we prefer to do simple open prostatectomy in cases with a large prostate, so the role of robotic simple prostatectomy should be assessed in the other studies.

CONCLUSIONS

Open simple prostatectomy is a feasible procedure in

patients whose prostate is larger than 70 grams after previous TURP, but it is associated with more immediate and late complications.

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CONFLICT OF INTEREST

The authors have no conflicts of interest to announce.

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