A Modified Technique of Simple Suprapubic Prostatectomy
No Bladder Drainage and No Bladder Neck or Hemostatic Sutures

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Introduction: Open prostatectomy is the conventional surgical treatment of benign prostatic hyperplasia. The major early complication of this procedure is bleeding. We introduce a technique of prostatectomy in order to prevent significant bleeding, reduce morbidity, and shorten convalescence and hospital stay periods.

Materials and Methods: We enrolled 202 consecutive patients diagnosed with benign prostatic hyperplasia who were candidates for open prostatectomy. The operation was performed by one surgeon within 6 years using a modified technique of simple suprapubic prostatectomy (no bladder drainage and no bladder neck suture). Clot retention episodes, hemoglobin decrease, urethral catheterization time, and hospital stay were evaluated postoperatively. The patients were followed up for 1 to 2 years.

Results: The mean operative time was 18 minutes (range, 14 to 28 minutes) with an estimated mean intra-operative blood loss of 120 mL. The mean hospital stay was 3 days (range, 2 to 4 days). The median urethral catheterization time was 5 days. No intra-operative complication or mortality was noted. Return to baseline urinary function and subjective continence at 3 months were 100% and 99%, respectively. Only in 1 patient (0.4%), bladder neck contracture was detected 3 months after the operation.

Conclusion: Transurethral prostate resection has been introduced as the surgical treatment of choice in patients with benign prostatic hyperplasia. However, open prostatectomy still has a place. Suprapubic prostatectomy with no bladder drainage and no bladder neck suture appeared to be successful in decreasing convalescence and hospitalization times, with no significant complication, major blood loss, or bladder neck contracture.

INTRODUCTION

Clinical benign prostatic hyperplasia (BPH) is a highly prevalent disease. By the age of 60 years, nearly 60% of the cohort of the Baltimore longitudinal study of aging had some degree of clinical BPH.[1] Minimally invasive procedures for bladder outlet obstruction secondary to BPH have been developed, such as visual laser ablation, transurethral electrovaporization, transurethral needle ablation, transurethral microwave thermotherapy, interstitial laser coagulation, and transurethral incision of the prostate.[2-6] These techniques are associated with low morbidity and short-term catheterization. However, they are usually reserved for men with moderate symptom

severity and a small to medium prostate.

Traditionally, transurethral resection of the prostate (TURP) and open prostatectomy are used in patients with acute urinary retention, persistent or recurrent urinary tract infections (UTIs), severe hemorrhage from the prostate, bladder calculi, high international prostate symptom score (IPSS) unresponsive to medical therapy, and renal insufficiency as a result of chronic bladder outlet obstruction. Open prostatectomy offers the advantages of a lower re-treatment rate and more complete removal of the prostate adenoma under direct vision, while it avoids the risk of additional hyponatremia (TURP syndrome).[7] It can be performed by the retropubic or suprapubic approach. The standard suprapubic approach consists of enucleating the hyperplastic adenoma through an extraperitoneal incision of the anterior bladder wall. Finally, a urethral catheter and cystostomy are fixed. However, there is a certain risk of postoperative morbidity associated with this surgical technique, including hemorrhage, clot retention, incontinence, urethral or bladder neck stricture, and UTI.[8] In this study, suprapubic prostatectomy was done without cystostomy insertion but with a silicone 3-way Foley catheter, which led to decreased hospitalization, cystostomy site leakage, morbidity, and cost.

MATERIALS AND METHODS

Patients

The study was a single-center trial done at Kamkar Hospital, Qom University of Medical Sciences, from April 2003 to December 2008. During the study period, 310 consecutive men with symptomatic BPH presented to our outpatient urology clinic with significant symptoms of bladder outlet obstruction secondary to BPH. Twenty-two patients were not good candidates for surgery due to underlying conditions, such as congestive heart failure or ischemic heart disease. The other patients were scheduled for surgery (TURP or open prostatectomy) after full cadrdiovascular, coagulation, and routine biochemichal laboratory evaluations. Before the evaluation, 276 patients

(89.9%) had received some medical therapy of BPH, like α-blockers (terazosin, 2 mg/d to 4 mg/d) and/or 5 α-reductase inhibitor (finastride, 5 mg/d). One hundred and two patients (33.3%) complained of diabetes mellitus that were under treatment with oral hypoglycemic agents or insulin therapy.

In all of the patients, cystourethroscopy was performed to rule out urethral stricture or bladder malignancy. By means of this procedure and prostate ultrasonography, the patients were selected for TURP or open prostatectomy on the basis of their prostate volumes. In rough estimate, if prostate volume was greater than 60 g to 70 g, open prostatectomy was selected. Digital rectal examination, routine laboratory data, serum level of prostate-specific antigen (PSA), and urinary system ultrasonography were performed in all of the patients. If digital rectal examination findings or PSA values were abnormal, transrectal prostate biopsy would be performed; 34 patients (11.0%) underwent biopsy, in 2 of whom prostate carcinoma was detected. The remaining 32 patients were scheduled for open prostatectomy. Overall, 84 men were scheduled for TURP and excluded from the study, and the 202 remaining were scheduled for open prostatectomy.

Surgical Technique

After preparation and drape and under spinal anesthesia, 183 patients (90.5%) underwent open prostatectomy with Pfannensteil incision and the remaining 19 (9.5%) were operated on through a low midline incision. After incising the lower median abdominal wall, fascia, and muscles, the anterior bladder wall was opened vertically and prostate lobes were enucleated conventionally. The prostate fossa was packed with a gauze sponge for less than 1 minute, and then, a 22-F or 24-F 3-way silicone Foley catheter was introduced transurethrally and was fixed. The Foley ballon was filled with 40 mL to 60 mL of distilled water. The bladder wall was closed with 0-0 chromic catgut suture. A mild traction was inserted on the Foley, and a suprapubic tubular drain was fixed. The abdominal wall layers were repaired subsequently. At the end, normal saline irrigation of the bladder via the 3-way Foley catheter was

begun, and the traction on the catheter was released. The tubular drain was removed 48 hours after the operation. The Foley catheter was removed after 5 days.

The patients were followed-up for 1 to 2 years. The follow-up protocol was multiple visits as listed below: 3 months, 6 months, and 1 year after the operation, and then yearly. The evaluation during the follow-up period was done by ultrasonography of the kidneys and bladder, and a questionnaire about lower urinary tract symptoms, and in suspected cases urethroscopy for evaluation of urethral situations.

RESULTS

A total of 202 patients underwent open prostatectomy using the modified approach. Indications of admission in this group was a high IPSS in spite of medical therapy in 106 patients (52.5%) with a mean IPSS of 19.5, recurrent acute urinary retention in 35 (17.3%), bladder calculus in 28 (13.8%), recurrent UTI in 17 (8.4%), and bilateral hydroureteronephrosis in 16 (8.0%). Characteristics of the patients are listed in the Table.

The mean intra-operative blood loss, estimated by measuring of collected blood in the suction bottle and blood quantity of sponge gauzes, was 120 mL. Continuous isotonic saline irrigation performed

for the first 24 hours, and thereafter if needed. No Foley traction insertion was needed during hospital stay. In 5 patients (2.4%) clot retention episodes were detected 4 to 12 hours after the operation, all of which were treated with forceful irrigation and evacuation of clots. Cystoscopic management of continuous bleeding or open re-exploration was not needed in any of the cases. The mean duration of hospital stay was 3 days (range, 2 to 4 days).

Hemoglobin level at discharge was 1.8 g/dL on average lower than that at admission. Complete blood count was checked 6 hours after the surgery, and then daily, in addition to serum creatinine. In 29 patients (14.3%), serum hemoglobin was lower than 10 g/dL during hospital stay, and transfusion of packed cell was done (2 units in 21 and 3 units in 8). The Foley catheter was removed on the 5th to 6th day after the operation (median 5 days; range, 5 to 8 days). In 3 patients (1.4%), recatheterization was needed for another 3 to 5 days due to retention or rebleeding.

Pathology report in all of the patients was in favor of BPH, except 6 patients that were found to have incidental prostate adenocarcinoma. In 1 patient, persistent vesicocutaneous fistula was detected 2 weeks after removal of the Foley catheter. This patient was recatheterized, and fistula was cured after 2 weeks. Postoperative epididymoorchitis was noted in 8 patients (3.9%), 1 to 3 weeks after the operation, all of which were treated by appropriate oral antibiotics. Bladder neck contracture was detected in 1 patient (0.4%) after 3 months. Retrograde ejaculation occurred in 160 patients (72.9%). The mean residual urine volume decreased from 126 mL pre-operatively to 10 mL 3 months after the operation.

Significant decrease in the IPSS occurred after the operation (the mean IPSS decreased from 19.5 to 1.5, after 3 months). Of the 202 patients, 174 (86.1%) were visited at the end of the 1st year after the operation and 102 (50.5%) were visited at the 2nd year. No new situations like regrowth of the prostate tissue, urethral stricture, or bladder neck contracture was noted. One death due to urosepsis occurred 3 months after the operation.

Patients' Characteristics and Operation Outcomes*

Variable	Value
Mean age, y	69.7 (54 to 87)
Mean body mass index, kg/m^2	25.8 (19 to 31)
Body weight, kg	79.4 (58 to 92)
Mean enucleated prostate volume	83 (50 to 156)
Mean intra-operative blood loss, mL	120 (90 to 200)
Irrigation fluid volume, L	35 to 40
Mean hemoglobin, g/dL	
Baseline	13.3 (10.4 to 15.4)
At discharge	11.5 (9.3 to 13.5)
Median hospital stay, d	3 (2 to 4)
Median follow-up, y	2 (1 to 2)
Complications	
Unilateral epididymioorchitis	8 (3.9)
Urethral recatheterization	3 (1.4)
Bladder neck contracture	1 (0.4)
Vesicocutaneous fistula	1 (0.4)

*Values in parentheses are ranges for continuous variables and percents for dichotomous variables.

DISCUSSION

Open prostatectomy (suprapubic or retropubic) and TURP are the conventional surgical options for the treatment of BPH. Open prostatectomy is the treatment of choice for large glands (80 mL to 100 mL), cases associated with complications such as large bladder calculus, or in cases in which resection of the bladder diverticula is indicated.[9]

Open simple suprapubic prostatectomy is occasionally performed for symptomatic and large-volume BPH. Similar to the traditional open in the supine position, skin and the underlying layers are opened (low midline or Pfannensteil incision). The bladder is opened vertically; an electrocautery is used to create a circular incision in the bladder mucosa distal to the trigone. Using a pair of Metzenbaum scissors, the plane between the prostatic adenoma and prostatic capsule is developed at the 6 o'clock position. After enucleation of the prostate lobes, a 0-0 chromic suture is used to place 2 figure-of-eight stitches to advance the bladder mucosa into the prostatic fossa at the 5 o'clock and 7 o'clock positions at the prostatovesical junction to ensure control of the main arterial blood supply to the prostate. After introducing a urethral catheter, a Malecot suprapubic tube is placed into the dome of the bladder and secured with a chromic stitch.[9] We did not use such previously mentioned methods, and did not face any additional complication. Urinary extravasation can also be of concern in the immediate postoperative period; this most likely results from an incomplete closure of the cystostomy site in suprapubic prostatectomy.[9] We did not have such a problem due to the absence of cystostomy tube in our technique. Retrograde ejaculation occurs in approximately 80% to 90% of patients following surgery.[9] The rate of this adverse effect was similar in our study. Also, approximately 2% to 5% of patients develop a bladder neck contracture 6 to 12 weeks after an open prostatectomy.[10] We had such an adverse effect in only less than 0.5% of our patients.

Luttwak and coworkers studied the results of open prostatectomy on the 98 men. The mean operative time was 62 minutes, and 56.6% of the patients received 1 to 4 units of packed cell. Bladder neck constriction and urethral strictures occurred in 4.1% and 3% of cases, respectively.[11] The rate of our blood transfusion was 14.3%, bladder neck contracture was 0.4%, and no urethral stricture was noted. The total complication rate in Tubaro and associates' study on the 32 patients was 31.3%.[12] This rate in our study was 6.4%. In the study of Takle and coworkers on 66 patients,[13] the mean operative time was 88 minutes, blood loss during the operation was 917 mL, 50% of the pateints needed blood transfusion during hospital stay, and 9% needed surgical re-intervention during the first 30 days. The time to removal of the postoperative catheter was 7.2 days and postoperative hospital stay lasted for 8.4 days. Whereas, median hospital stay of our patients was 3 days and catheterization time was 5 days.

Wound infection was the most common complication (35%) following open prostatectomy in Kiptoon and colleague's study.[14] Zargooshi reported a transfusion rate of 3.3% in 3000 cases, and the acute myocardial infection rate was 0.5%.[15] Long-term complications including bladder neck contraction, urethral stricture, and meatal stenosis, occurred in 5.2% of cases were reported by another team.[16] Urethral complications rate of our series was 0.4%. The most common reported nonurologic adverse effects included deep vein thrombosis, pulmonary embolus, myocardial infarction, and a cerebral vascular event. The incidence of any one of these complications is less than 1%. We did not have any of these complications. For reducing bleeding, some other methods are used such as bladder neck hemostasis at 5 o'clock and 7 o'clock positions or using some local vasoconstrictors like ornithine-8 vasopressin. We believe that our method requires further case-control studies and it should be applied in a larger population to be evaluated more comprehensively.

CONCLUSION

Transvesical prostatectomy proved to be successful, with a low rate of complications. Its success had a durable effect and a corrective procedure was rarely necessary. Our method of cystostomy-free open prostatectomy is a good way of decreasing hospital stay, complications,

and costs in patients with BPH, with faster recovery and much shorter catheterization time. No added risk or complications were detected in our series. This approach can be considered in the list of possible treatment modalities to discuss with patients with an enlarged prostate.

CONFLICT OF INTEREST

None declared.

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