

Laparoscopic simple prostatectomy

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Classically, surgical options for very large prostate glands, not amenable to transurethral resection, include suprapubic or retropubic simple prostatectomy and Holmium laser enucleation of the prostate (HoLEP). We

present a case managed with a laparoscopic simple prostatectomy. Technical considerations are discussed as well as possible advantages of this approach including decreased blood loss, faster patient recovery and improved visualization.

Key Words: laparoscopic simple prostatectomy, retropubic prostatectomy, benign prostatic hyperplasia

Case report

A 73-year-old man had been followed for 5 years with lower urinary tract symptoms consisting of a slow urinary stream, intermittency, occasional urgency and nocturia three times per night. Digital rectal exam revealed a very large, benign feeling prostate. Maximal flow rate was 4 ml/s with a voided volume of 156 ml and post-void residual was approximately 100 ml. Prostate specific antigen (PSA) levels had ranged between 14 ug/L and 15 ug/L. Over a period of 3 years he had had three transrectal ultrasound

(TRUS) guided biopsies due to the elevated PSA level. The ultrasound demonstrated a 120 gr prostate and the biopsies revealed benign prostatic hyperplasia and focal areas of chronic prostatitis. Cystoscopy demonstrated a trabeculated bladder with hypertrophy of the lateral lobes of the prostate. There was no significant median lobe enlargement and no urethral abnormality. He had been resistant to receiving medical treatment for his prostatic obstruction and subsequently presented with acute urinary retention. He was started on an alpha blocking agent (tamsulosin 0.4 mg po daily) but still failed multiple trials of voiding, necessitating operative intervention.

Due to the large size of the patient's prostate gland, we recommended a simple retropubic prostatectomy. Both the open and laparoscopic approaches, with their potential advantages and disadvantages, were

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discussed with him and he chose the laparoscopic approach, understanding that this represented a new procedure. Holmium laser enucleation of the prostate was not available at any institution in the city at that time. This is now being performed by the senior author and is offered as an alternative approach.

The patient was placed in low stirrups, with the table slightly flexed and in Trendelenburg position. A 1.5 cm incision was made in the infra-umbilical midline and, staying extraperitoneal, the space of Retzius was developed with finger dissection. A 12 mm blunt tipped trocar was placed, the space of Retzius insufflated with carbon dioxide (CO₂), and the space initially developed using the camera as a dissector. A 5 mm port was placed under direct vision in the midline halfway between the umbilicus and pubic symphysis. The space of Retzius was then developed with a combination of sharp and blunt dissection. Additional ports were placed as follows, see Figure 1: on the patient's left side a 5 mm port was placed approximately half way between the

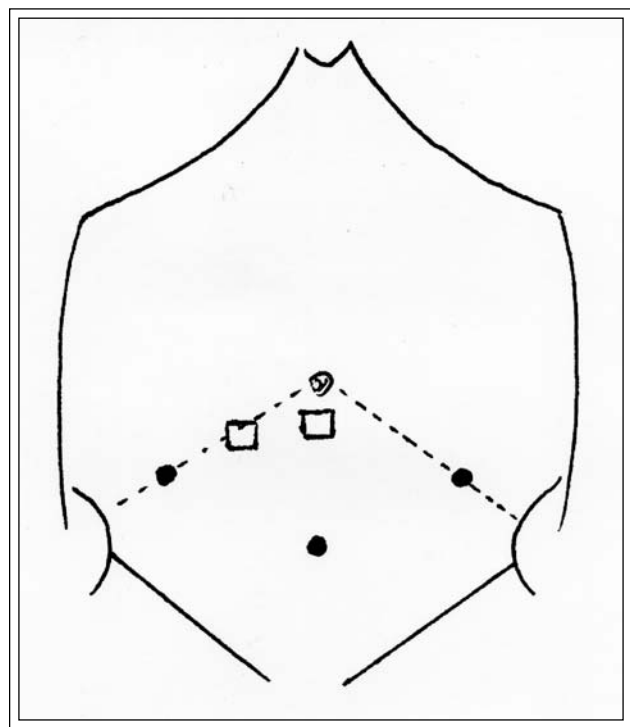


Figure 1. A total of five ports were used. • = 5 mm ports, □ = 12 mm ports. The camera was placed through the infra-umbilical port with the surgeon standing on the patient's left and operating through the left lower quadrant and medial right lower quadrant ports and the assistant through the lower midline and lateral right lower quadrant port.

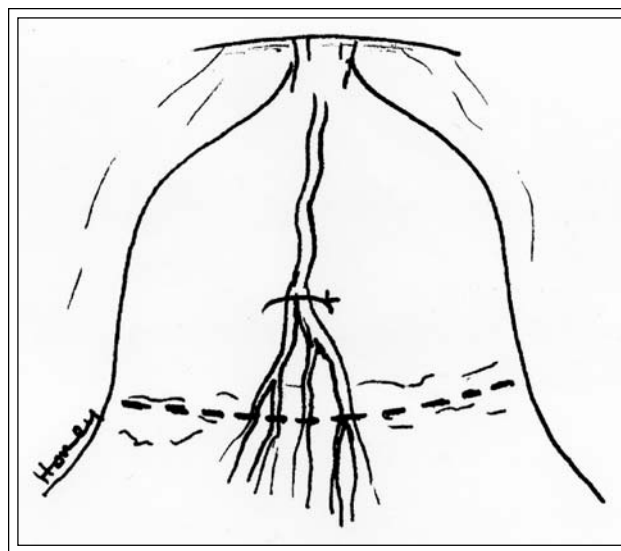


Figure 2. A stitch was placed just distal to the prostatovesical junction to control bleeding and was grasped with an instrument to provide traction on the capsule.

anterior superior iliac spine and the umbilicus; on the right hand side 12 mm and 5 mm ports were placed one third and two thirds of the distance respectively from the anterior superior iliac spine, to the umbilicus.

After clearing the endopelvic fascia and the anterior surface of the prostate of overlying fat as one would do for a radical prostatectomy, the bladder neck was identified. A 2-0 Vicryl on a SH needle was placed on the prostatic side to control the dorsal venous complex, Figure 2. A transverse cystotomy was made 1 cm proximal to the prostatovesical junction using L-hook cautery. The bladder incision was extended from the 9 o'clock to the 3 o'clock position down through the bladder neck fibers until the prostatic adenoma was identified. Using the previously placed stitch, the anterior capsule was elevated and an incision made between the capsule and the adenoma anteriorly. The plane between the capsule and adenoma was developed with a combination of sharp and blunt dissection, Figure 3. This was then carried laterally and posteriorly, with cauterization of all perforating vessels, gradually developing the plane between adenoma and capsule. Larger perforating branches of the prostatic vessels located near the 4 and 8 o'clock positions were controlled with fine bipolar cautery. There was no median lobe in this case. Once the lateral lobes were free halfway to the apex, the anterior commissure of the prostate was divided in the midline. The right lobe was then freed to the apex and apical attachments and urothelium were

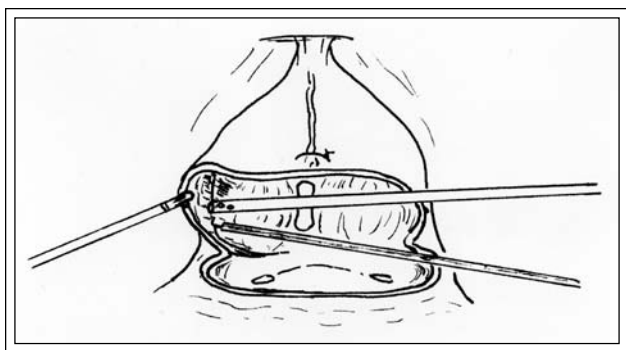


Figure 3. A transverse cystotomy was made just proximal to the prostatovesical junction. The urothelium was incised and a plane developed between capsule and adenoma.

divided with scissors just proximal to the verumontanum. The right adenoma was now completely enucleated and placed on the endopelvic fascia for retrieval. A similar procedure was performed for the left side, Figure 4.

The cut edge of the trigone was advanced over the bladder neck fibers and sutured to the floor of the prostatic cavity with two 3-0 vicryl sutures on an RB1 needle, Figure 5. A 22 Fr 3-way continuous bladder irrigation (CBI) catheter was placed in the bladder. The transverse bladder neck incision was closed with two running 2-0 vicryl sutures on a CT1 needle starting at each apex and meeting in the midline. The balloon was inflated with 30 ml of sterile water. Irrigation demonstrated no leak from the suture line and returns were pale pink colored and complete. The adenoma was removed with a small endocatch bag.

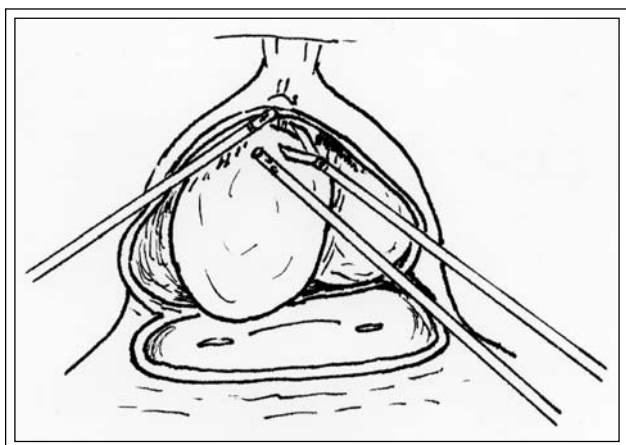


Figure 4. The adenoma was enucleated to the apex where urethra and apical attachments were divided with laparoscopic scissors.

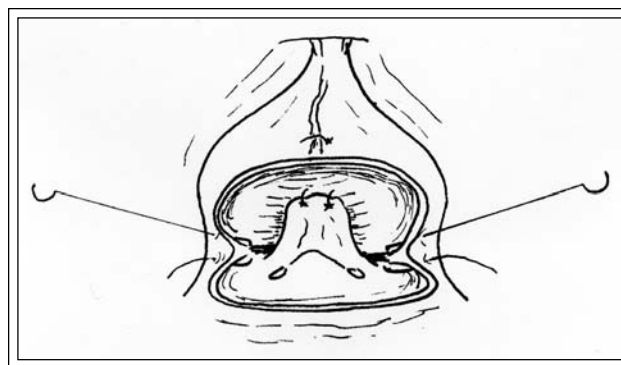


Figure 5. The edge of urothelium at the trigone was sutured to the floor of the prostatic capsule. It can be secured directly to the urethral mucosa if it is tension free. The transverse cystotomy was closed after passage of a urethral catheter under direct vision.

A 10 mm flat Jackson Pratt (JP) drain was placed through the right lower quadrant 5 mm port site. Total operative time, including anesthesia and recovery, was 330 minutes and estimated blood loss was 600 ml. Continuous bladder irrigation was initiated in the recovery room. Initial JP drainage was minimal, however, overnight the catheter blocked and drainage increased to 600 cc. Irrigations were clear and the JP drainage stopped with cessation of CBI. On post-operative day number 4 the JP drain was removed and the patient was discharged home with his catheter in place. He required only postoperative ketorolac, acetaminophen and codeine for analgesia. The catheter was removed on post-operative day number 14 and the patient voided spontaneously with a maximum flow rate of 12 ml/s, with a voided volume of 110 ml and a normal shaped flow versus time curve. Pathology demonstrated mixed fibromuscular and adenomatous hyperplasia with small focal areas of prostatitis and no malignancy.

Discussion

Simple retropubic or suprapubic prostatectomy is now reserved for unusually large glands (over 100 grams); or for patients with concomitant large bladder stones or a contraindication to transurethral resection (TURP) such as inability to place the patient in lithotomy position.

The laparoscopic approach was first described in 2002.¹ Subsequently three case series with a total of 40 patients have been reported using both an extraperitoneal and intraperitoneal approach.²⁻⁴

Advantages of the extraperitoneal approach include

minimizing bladder dissection and mobilization and avoiding the risk of an intraperitoneal urine leak. The trade off is a smaller operative space that can hinder suturing and the risk of inadvertently opening a small defect in the peritoneum. This may result in CO₂ collecting in the peritoneum, further reducing working space.

In the most recent series, Sotelo et al reported excellent results in their series of 17 patients from two institutions. Average operative time was 156 minutes with 516 ml of blood loss. On average, catheters were removed on post-operative day 6 and peak urine flow rose from 7 ml/s to 22.8 ml/s. One patient required a TURP for persistent obstruction and 22% (4 patients) required temporary recatheterization.⁴ Our patient's discharge and catheter removal were somewhat delayed due to the initial increase in Jackson-Pratt drainage secondary to the CBI with a blocked catheter. Maintenance of our patient's indwelling catheter for 14 days is in accordance with our standard radical prostatectomy protocol, but was unnecessary in this case. Given the fact that the simple prostatectomy normally has a water-tight anterior closure, it would seem reasonable to leave the indwelling catheter for a significantly shorter period and possibly perform a cystogram to exclude the presence of leakage. From the literature and past experience with open procedures, catheter drainage for 5 days without a cystogram would seem reasonable in the majority of cases.⁴

Several modifications of technique are described in previous series in order to minimize blood loss and decrease operative time. By placing a stitch just distal to the prostatovesical junction and performing a transverse cystotomy, one can avoid an incision of the anterior prostatic capsule and minimize disruption of the subcapsular venous plexus, Figure 2. Secondly, dissection of the capsule from the adenoma under magnification allows visualization of the perforating branches of the prostatic arteries and control with bipolar cautery or a harmonic scalpel, Figure 3. Lastly, pneumoperitoneal pressure can control small venous bleeding sites which then clot spontaneously.

Laparoscopic simple prostatectomy is a rarely indicated and technically challenging operation. There is a significant learning curve and the demanding nature of this procedure is evidenced by the operative time of 330 minutes. By contrast, the two previous open simple retropubic prostatectomies performed by the authors for glands of 132 and 90 grams took 85 and 95 minutes, respectively. Advanced laparoscopic skills are required for suturing of the trigone and closure of the transverse cystotomy.

Excellent results in previous series are encouraging but evidence regarding advantages, such as decreased post-operative pain, decreased blood loss, shorter hospital stay or shorter indwelling catheter time, when compared with open retropubic prostatectomy, are lacking. Alternatives such as Holmium laser enucleation of the prostate (HoLEP) have similar technical challenges with a similar learning curve and long operative times. However the advantages described above have been demonstrated.⁵

Laparoscopic simple prostatectomy is feasible however it is, initially, a technically challenging and time consuming procedure. Further evaluation is required to determine if there are benefits in terms of blood loss, hospital stay and length of indwelling catheter time and where this procedure might fit into one's treatment algorithm for benign prostatic hyperplasia. □

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