



Radical Perineal Prostatectomy

Radikal Perineal Prostatektomi

Cemal Göktaş, A. Cihangir Çetinel, K. Fehmi Narter

Kartal Dr. Lütfi Kırdar Research and Training Hospital, Clinic of Urology, İstanbul, Turkey

ABSTRACT

Prostate cancer is the most common malignancy and the second leading cause of cancer death in men. Complete surgical removal of the prostate is the most commonly used treatment option for patients with localized prostate cancer. Surgical treatment of localized prostate cancer includes radical retropubic prostatectomy, radical perineal prostatectomy and robotic/laparoscopic radical prostatectomy. Since lymphadenectomy from the same incision is not possible in radical retropubic prostatectomy, this approach is less preferable. On the other hand, when radical perineal prostatectomy in well selected cases is compared with radical retropubic prostatectomy in terms of many operational or functional criteria, similar results were obtained. In this paper, we aimed to report our experiences with this uncommon surgical approach.

Key Words

Radical perineal prostatectomy, prostate cancer, surgical technique

ÖZET

Prostat kanseri erkeklerde en sık görülen kanser olup, kansere bağlı ölümler arasında ikinci sıradadır. Lokalize hastalıkta radikal cerrahi olarak tüm prostatin çıkartılması esastır. Bu cerrahi yaklaşımlar arasında radikal retropubik prostatektomi, radikal perineal prostatektomi, robotik/laparoskopik radikal prostatektomi sayılabilir. Aynı insizyondan lenfadenektomi yapılamıyor olması radikal perineal prostatektominin çok tercih edilmemesine ve birçok merkezde uygulanmamasına sebep olmuştur. Oysa seçili lokalize olgularda operasyona ait parametreler, takip kriterleri gibi birçok kıyaslamada diğer metotlara benzer sonuçlar vermiştir. Metodun tecrübeli ellerde perop kendine özgü avantajlarında bulunmaktadır. Biz de yazımızda az uygulanan bu operasyonu nasıl yaptığımızı anlatmaya çalıştık.

Anahtar Kelimeler

Radikal perineal prostatektomi, prostat kanseri, cerrahi teknik

Introduction

Radical perineal prostatectomy (RPP) is an alternative approach to the surgical treatment of patients with clinically organ-confined prostate cancer (\leq cT2). This technique is not suitable for the staging lymphadenectomy from the same incision, and not applicable for some patients who have inadequate exaggerated lithotomy position (i.e. hip pathologies), respiratory limitations or large prostate (>100 g). On the other hand, in some patients with extreme obesity and a history of previous retropubic surgery (i.e. herniotomy with mesh implantation, renal transplantation), it may be preferable instead of radical retropubic prostatectomy (RRP).

RPP is an oldest approach of the radical prostate cancer surgery. Nowadays, this technique is not used in many clinics due to its major limitation. We believe that this approach may be good alternative option for selected patients with organ-confined prostate cancer. This approach has some disadvantages: lymphadenectomy from the same incision is not possible, whereas functional or oncologic outcomes of this technique are comparable with the other robotic or retropubic techniques. Some authors suggested that limited lymphadenectomy could be performed via transected endopelvic fascia during the RPP

approach. But nowadays, extended lymphadenectomy is recommended for radical prostate cancer surgery, and it is not possible during the RPP. On the other hand, some authors suggested that RPP is an alternative approach compared with RRP for localized prostate cancer. Albayrak et al. reported better early continence outcomes for RPP in \leq cT2N0M0 (1). Additionally, some authors have claimed that since the abdomen and lower retroperitoneum are not used in this technique, RPP was less invasive approach. Minimal invasiveness is associated with shorter length of hospital stay, lower cost and better quality of life. In the literature, we can find many comparison studies about these topics (2,3,4). We preferred to make this approach for patients who had a lymph node involvement rate of less than 5% in the Partin nomogram and those with a Gleason score of \leq 3.

In Turkey, this approach is not the first choice in radical prostate surgery because the perineum is not known enough among the urology specialists. However, RPP has been performed since than Albayrak et al. in our department. Currently, this approach is not a routine procedure for these patients in many clinics, but we perform it routinely in well selected patients. Recently, with the new developments in prostate anatomy and surgery, there are improvements in outcomes as in that of other radical prostate approaches.

Correspondence

K. Fehmi Narter MD, Kartal Dr. Lütfi Kırdar Research and Training Hospital, Clinic of Urology, İstanbul, Turkey
E-mail: fehminarter66@gmail.com Received: 28.04.2015 Accepted: 29.04.2015

Surgical Technique

The most important difference between RPP and RRP is that in RPP technique, we can easily reach the apex of the prostate from the bottom upwards, thus, there is no need for tethering during the dissection of the retropubic dorsal venous complex region on the upper side of the prostate.

Appropriate position for RPP is the exaggerated dorsal lithotomy. In this position, the perineum is brought into a 45° plane from horizontal, with the buttocks just off the table edge. Two different routes have been described in the literature. These are Young's "suprasphincteric" route and Belt route (5,6). Young's route follows a plane through the central tendon below the bulbocavernosus muscle of the urethra and above the sphincter ani externus muscle. The other route elevates the sphincter ani externus muscle (subsphincteric) and uses the anterior rectal surface as a landmark to reach the prostate (Paulson). Belt described a new approach to the prostate through the perineum between the longitudinal fibers of the rectum and the circular fibers of the external anal sphincter. In the beginning of the operation, we suture a glove on the anus that we can use it for rectal examination and it may protect the operational area from contamination via the rectum. We can choose Young or Belt route for RPP depending on surgeon's decision.

Firstly, reverse semicircular incision above the anus is done medially from one ischial tuberosity to the other. After the incision is completed, dissection of the subcutaneous fatty tissue is done by electrocautery (Figure 1).

Traction will expose the central tendon (connects the bulbospongiosus muscle with the middle and deep portions of the external anal sphincter) (Figure 2). After transection of the central tendon in the middle, and sometimes it is unclear, the bulbospongiosus muscle and the external anal sphincter will be clearly separated by this tendinous structure. The bulbospongiosus muscle is important to delineate the fibres of the rectum and it is removed by retractor. After the dissection of the levator ani muscles laterally off the apex of the prostate, the rectourethralis is the last attachment of the rectum to the prostatourethral junction. Once the ischiorectal fossa is open bilaterally, the attachment of the rectum to the rectourethralis muscle will be apparent (Figure 3, 4).

In this stage, correct plane of dissection is very important for protection from rectal injuries and follow up corpus spongiosum or transurethral catheter on the up position. The rectourethralis muscle is incised for dissection progresses. Once the rectourethralis muscle is divided, the rectum can be swept off the prostate and the prostatic dorsal surface

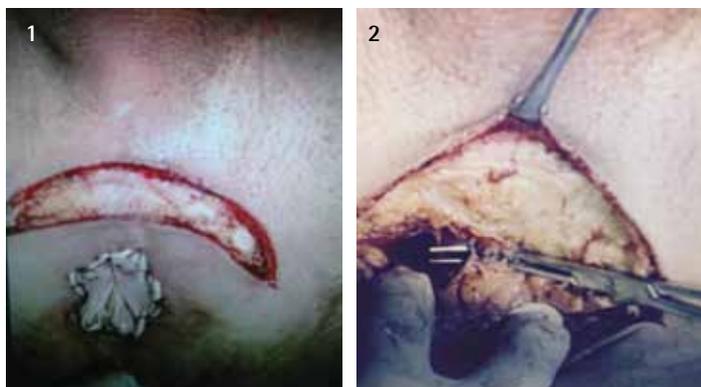


Figure 1-2. Left: Reverse semicircular perineal incision and suturing a glove on the anus for digital rectal examination or to protect from contamination. Right: transected central tendon

with Denonvilliers' fascia will be visualized. The levator ani muscles on both sides are held laterally with retractors. Transurethral catheter can be used for traction of the prostate. Subsequent aim is to reach apex of the prostate. After this stage, we try to make dissection of the seminal vesicles. If nerve-sparing prostatectomy is attempted, Denonvilliers' fascia is incised in the midline. At the level of the base of the prostate, Denonvilliers' fascia is then incised perpendicularly, but taking care not to advance the incision too laterally towards the posterolateral course of the neurovascular bundles. In this area we do not have to use electrocautery for controlling small bleeding and tethering may be the best option.

Dissection of the neurovascular bundles is continued cranially towards the apex and caudally to the seminal vesicles. The neurovascular bundles must be completely dissected from the prostatic surface (Figure 5). Dissection is carried down to the apex of the prostate and a few millimeters down to the prostatourethral junction. Denonvilliers' fascia covering the seminal vesicle tips should be stripped off from the seminal vesicles. When nerve-sparing surgery is not indicated, the neurovascular bundles have been ligated and divided on both sides at the apex (Figure 6). After sectioning the neurovascular bundles, the vas deferens and the seminal vesicles are identified and dissected free with blunt and sharp dissection on either side. The vas deferens is divided and ligated. Traction on the divided distal vas deferens in the contralateral direction will aid in identifying the corresponding seminal vesicle, which should be dissected carefully to avoid tearing. Once the seminal vesicle body has been readily dissected, the seminal vesicle artery can be controlled at its tip (Figure 7).

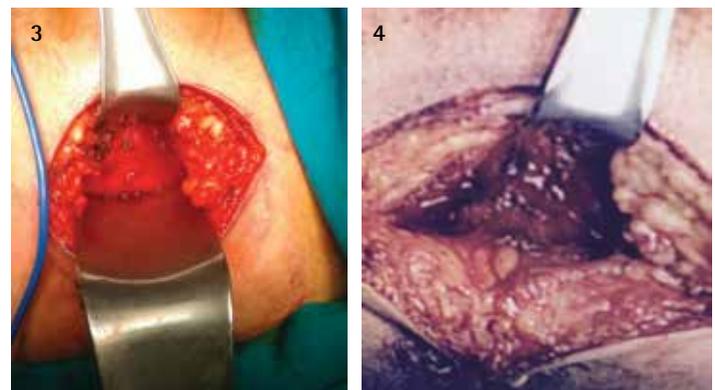


Figure 3-4. Left: After dissection, we can reach the prostate, Right: Ischiorectal fossa is open bilaterally, bilateral dark area on the prostate

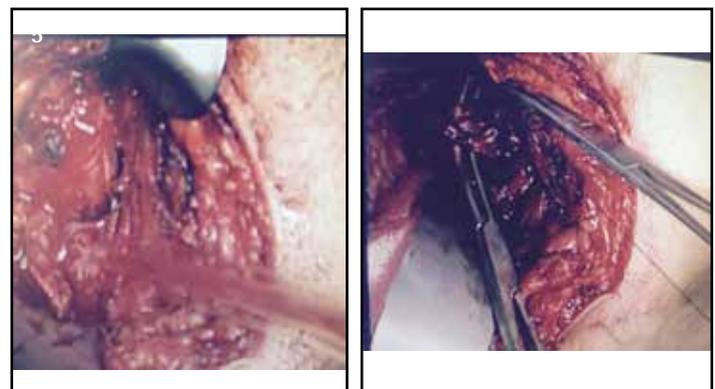


Figure 5-6. Left: Nerve-sparing, interfacial dissection. Right: Ligation of the pedicle

Caution should be taken in nerve-sparing prostatectomy to avoid damaging the nerve plexus by dissecting lateral to the tips of the seminal vesicles. Once the vas and seminal vesicle are dissected, the prostatic pedicles will become evident and can be transected between right angle clamps. Thereafter, by pulling both seminal vesicles and vas stumps cranially, retroprostatic dissection of the bladder neck can be carried on with curved scissors or using the harmonic scalpel. Dissection will begin in the midline and continue laterally on both sides to control remnant perivesical tissue with right-angle clamps or with an harmonic scalpel. Once dissection of the vesical neck has been completed, the seminal vesicles can be pushed back and dissection of the apex and urethra may begin. The seminal vesicles are freed, and the vas deferens and the prostatic pedicles sectioned. If we cannot do that easily, we prefer to use another dissection route from the bladder neck to the seminal vesicles, after sectioning of the bladder neck. The next step after dissection of the seminal vesicles is dissection of the lateral sides of the prostate. Mostly, we prefer to perform nerve-sparing surgery on at least one side. In these cases, we perform intrafacial dissection and we use sutures for tethering the lateral pedicles. This is an advantage for RPP approach. The dorsal circumference of the urethra is mobilized by blunt dissection off the prostatic apex with a dissector (Figure 8). To visualize a long urethral stump, the surgeon can push the prostatic apex with a strong forceps or a clamp.

After sectioning the dorsal circumference of the urethra on the apex with a retractor which is used to push the prostate downwards. A catheter is placed transurethraly, exteriorized through the incision



Figure 7. After apex dissection, we can reach the seminal vesicles

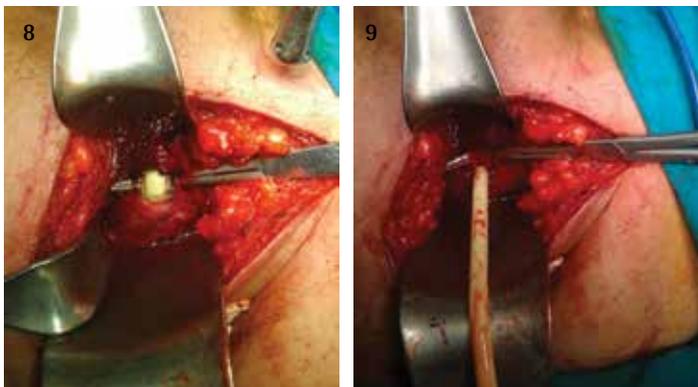


Figure 8-9. Left: After dissection, transurethral catheter in the urethra. Right: After transurethral catheter traction, we can separate posterior wall of the urethra

and pulled upwards to improve visualization of the prostatourethral junction (Figure 9). We do not use a special retractor, we prefer to use transurethral catheter that is inflated in the bladder for retraction.

Under tension, the ventral circumference of the urethra can be sectioned. Once the urethra has been transected, the puboprostatic ligaments are identified by blunt dissection of the midline with the finger or a dissector, sweeping off the dorsal vein complex ventrally and working against the bladder neck dorsally, and divided. The anterior prostatovesical junction can be identified by palpating the balloon of the transurethral catheter in the bladder. The prostate is dissected off the anterior bladder neck with curved scissors or the harmonic scalpel (Figure 10, 11, 12, 13). Once the prostatovesical junction has been dissected free the bladder neck is incised. A bladder catheter is inserted through the bladder neck incision into the bladder and blocked with 20-30 mL and the remaining bladder neck circumference incised. At this stage, we can take bladder neck frozen section biopsies. Before cutting the dorsal circumference of the bladder neck, the ureteric orifices or a middle lobe that developed intravesically can be identified. After sectioning the remaining attachments of the prostate to the bladder, the specimen is removed. We prefer to perform "bladder neck sparing technique" in this stage (Figure 14, 15, 16, 17).

For this reason, we dissect dorsal vein complex from the apex to the bladder neck with blunt dissection. After the dissection, we carefully separate the fibers of the bladder neck from the base of the prostate. If it is possible, the urethra is dissected separately, the bladder neck and prostatic urethra border are cut and the specimen is removed from this incision. The bladder neck mucosa may be fully everted to ensure exact mucosal apposition with the urethra (4/0 monofilament tie), but often this is unnecessary because of the good visualization of the bladder neck during anastomosis with the urethra. The bladder neck is reconstructed in a 'tennis racket' fashion to tailor an opening of 22-24 F. Generally, eight anastomotic sutures are used (4/0 absorbable double armed Monosyn) for anastomosing the urethra to the reconstructed bladder neck. The ventral urethrovesical circumference is reconstructed by placing four separate sutures in sequence at the 10, 11, 1 and 2 o'clock positions. After transurethral insertion of a silicone Foley catheter (20 F) and intravesical positioning, the ventral dorsal circumference is completed by placing sutures in sequence at the 4, 8, 5 and 7 o'clock positions. All sutures are tied immediately except for the 5 and 7 o'clock sutures; these can be anchored at the remnant tissue of the rectourethralis. We usually prefer to use continuous suture (3/0 or 4/0 absorbable) for anastomosis. Firstly, two sutures are replaced on 12 o'clock position, and continuous sutures are sustained clockwise and counter clockwise until the 6 o'clock position. Lastly, these two sutures are tied at this point (Figure 18, 19, 20, 21). If we prefer to use separated sutures, we replace 5-6 sutures for anastomosis. After completing the anastomosis, water tightness can be controlled by filling the bladder with 200-300 mL of saline, and the bladder catheter balloon is inflated with 30 mL of fluid. After visual and digital inspection of the integrity of the rectum and placing a penros drain, the pelvic floor is reconstructed by readapting the levator ani muscles in the midline. When rectal injury is suspected, we can test it with air inflation via transrectal catheter and observe the air bubble on the fluids in the operation area. After the bleeding control, we close the layers separately. Postoperatively, the drain is removed 1-2 days after surgery, a control cystogram taken after 7 days and the catheter removed on the same day if no extravasation is evident. We can see anatomy of the perineal and operation route on Figure 22 and 23.

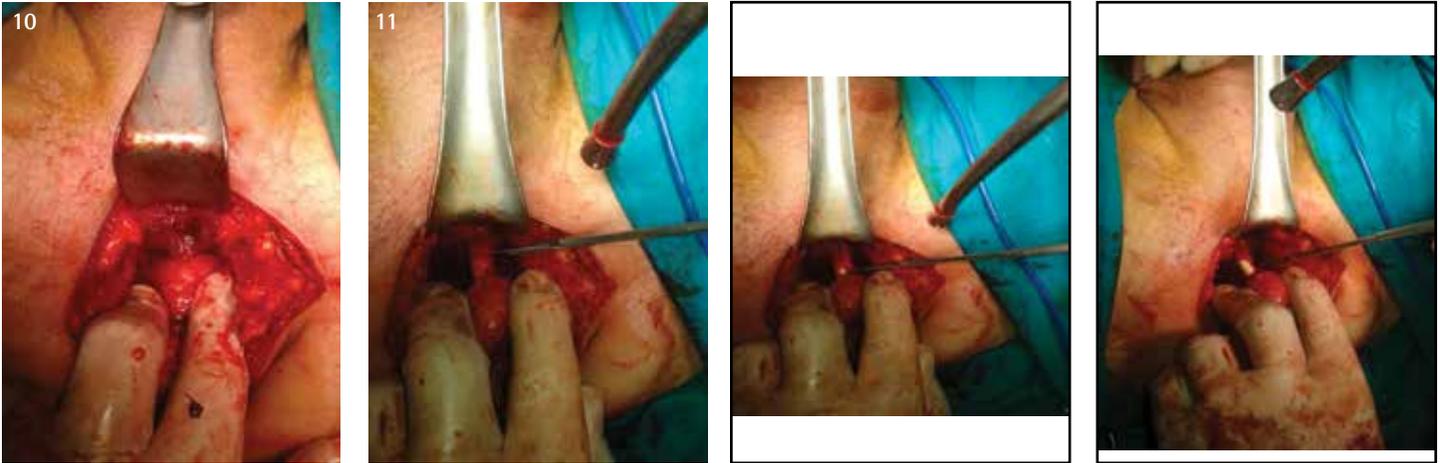


Figure 10,11,12,13. Left up: we can see the bladder neck. Right up, Left bottom: We separate the prostate from the bladder, we have to dissect it gently for "bladder neck-sparing surgery", Right bottom: Complete the dissection on the bladder neck

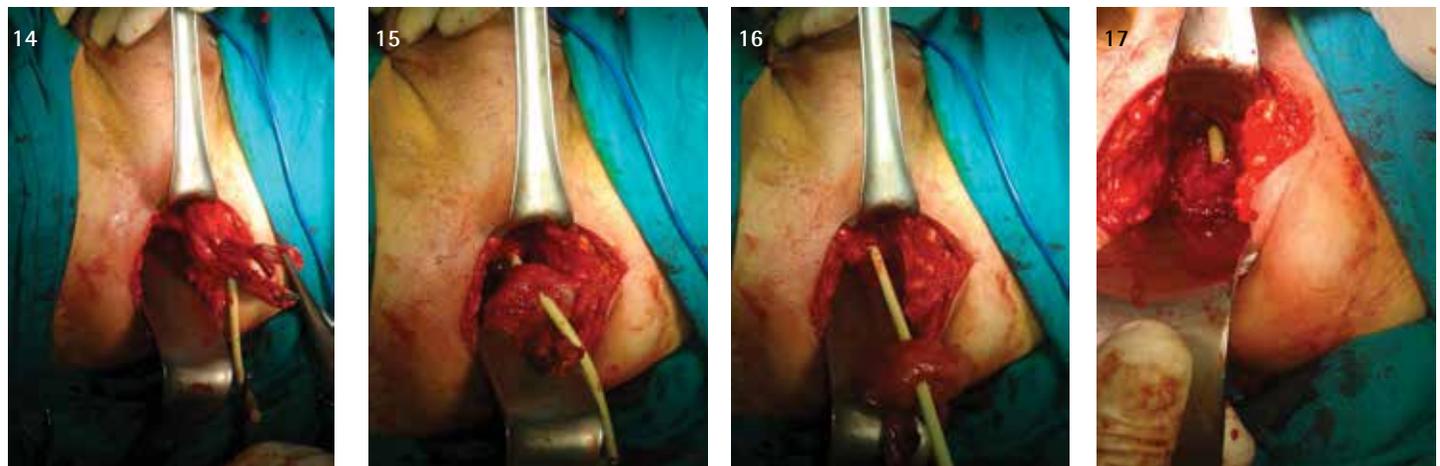


Figure 14, 15, 16, 17. Left up: Bilateral seminal vesicles on the dissected prostate, Right up and Left bottom: Completely dissected and removed prostate, Right bottom: After removal of the prostate, the view of the operation area

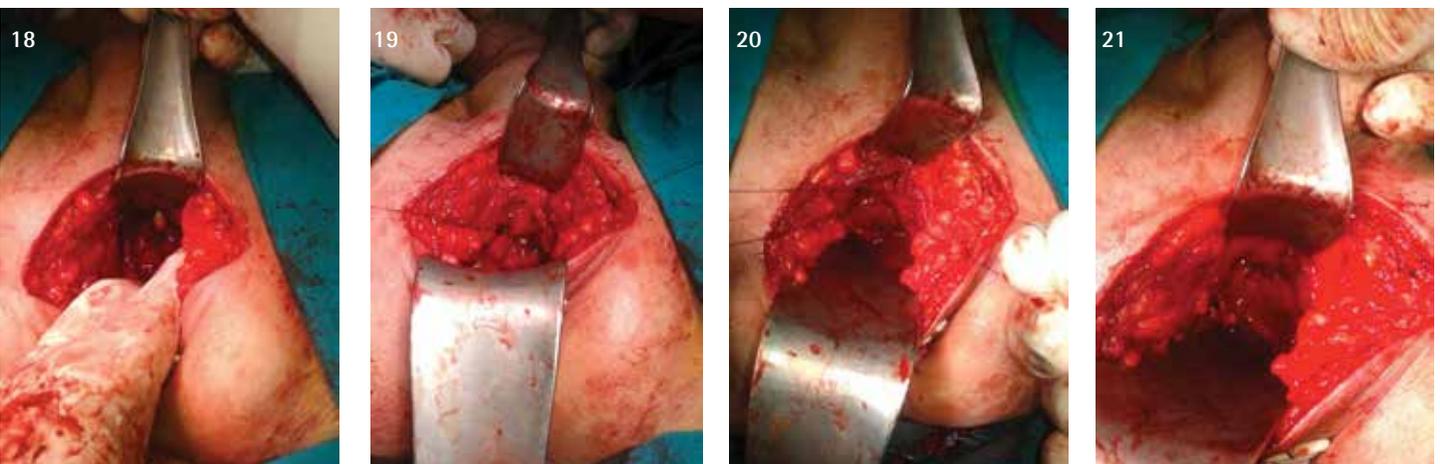


Figure 18, 19, 20, 21. Left up: Before the anastomoses operation area, Right up and Left bottom: Anatomoses sutures between the bladder neck and the urethra, Left bottom: View of complete anastomosis

Tricks and Tips

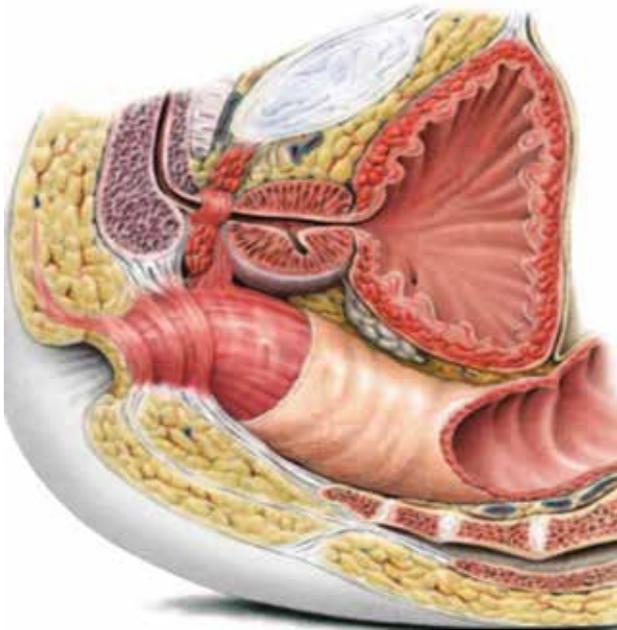
Recommendations;

- You can use a Lowsley retractor if you have. We prefer to use a transurethral catheter for traction. We prefer Richardson retractors

that are on the upper position and straight, long Deaver on the bottom position for traction.

- Transrectal digital examination may be of help. Transanal digital guidance may help to identify the position of the rectal wall with respect to the prostatic apex.

22



23

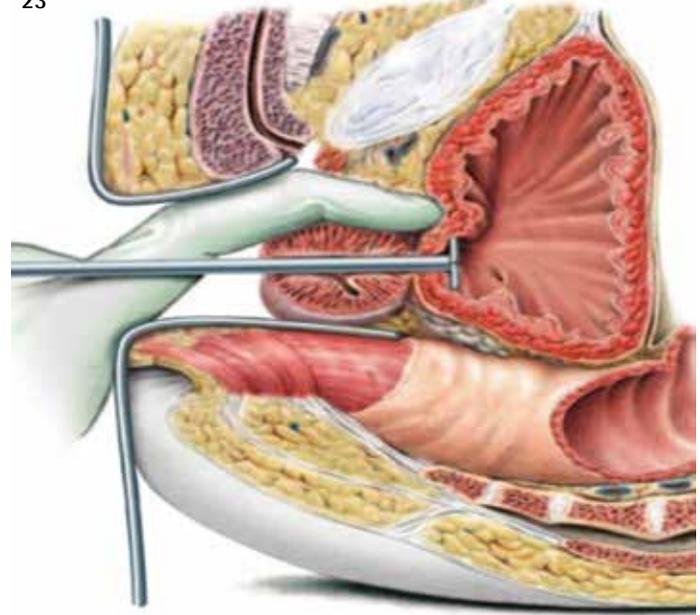


Figure 22, 23. Left: Schematic view of the regional anatomy, Right: Schematic view of the dissection route

- It is necessary to be careful in order to avoid the bladder neck to be sectioned close to the ureteric orifices.
- Bleeding from Santorini's plexus is rarely encountered and can be controlled with clips or with a figure-of-eight 3/0 absorbable sutures on a 5/8 circle needle.
- If there is a rectal lesion, use a transverse two-layer inverting suture. A rectal tube should be placed under manual guidance for anal dilatation. Intraoperative application of 500 mg metronidazole should be continued twice daily for 5 days. The rectal tube remains until the first bowel movement. Parenteral feeding should continue for 5 days.
- The self-retaining Bookwalter retractor obviates the need for a second assistant.
- Improve visualization of the operative field by tilting the table in a Trendelenburg or anti-Trendelenburg position as needed.
- Use long instruments.
- Apply traction to the skin flap tag suture to improve identification of the different layers.
- Always place a moist sponge between the rectum and the caudal retractor blade to avoid injury to the rectum.
- Perineal nerve-sparing prostatectomy is not recommended for large prostates because the prostate has to be removed between the neurovascular bundles, and this may cause damage by pressure or traction.
- The vas deferens should be isolated 1-2 cm towards the retrovesical space, otherwise the ligature will bunch the periductal tissue, including the tissue surrounding the seminal vesicles, and later dissection of the seminal vesicles may become difficult.
- To dissect the seminal vesicles use a Babcock clamp to grasp them. This atraumatic clamp will not traumatize them as easily as would an Allis clamp. Dissection is easier with intact seminal vesicles.
- A Duval clamp or atraumatic lung clamp can be used to grasp both seminal vesicles and vasa together, and pull them in a cranial direction to dissect the retroprostatic bladder neck.

- If the bladder neck has been reconstructed in a tennis racket fashion, leave the end of the suture at the neobladder neck long, to be able to pull on it in cephalad while tying the dorsal circumference anastomotic sutures, thus releasing tension on the sutures.
- 5/8 double armed needles improve maneuverability and allow for an inside-to outside suture.

Concept: Cemal Göktaş, Cihangir Çetinel, Fehmi Narter

Design: Fehmi Narter

Data Collection or Processing: Cemal Göktaş, Cihangir Çetinel

Analysis or Interpretation: Cemal Göktaş, Cihangir Çetinel, Fehmi Narter

Literature Search: Fehmi Narter

Writing: Fehmi Narter

Peer-review: Internal peer-reviewed.

Conflict of Interest: No conflict of interest was declared by the authors.

Financial Disclosure: The authors declared that this study has received no financial support.

References

1. Albayrak S, Cangüven O, Goktas C, Cetinel C, Horuz R, Aydemir H. Radical perineal prostatectomy and early continence: Outcomes after 120 cases. *Int Braz J Urol* 2010;36:693-699.
2. Compoj E, Pycha A. Experience with radical perineal prostatectomy in the treatment of localized prostate cancer. *Ther Adv Urol* 2012;4:125-131.
3. May M, Dorst M, May J, Hoschke B, Fahlenkamp D, Vogler H, Siegsmond M. Radical retropubic vs. radical perineal prostatectomy: A comparison of relative benefits in four urban hospitals. *Urol Nurs* 2007;6:519-526.
4. Holzbeierlein JM, Langenstroer P, Porter HJ 2nd, Thrasher JB. Case selection and outcome of radical perineal prostatectomy in localized prostate cancer. *Int Braz J Urol* 2003;29:291-299.
5. Young HH. VIII. Conservative Perineal Prostatectomy: The Results of Two Years' Experience and Report of Seventy-Five Cases. *Ann Surg* 1905;41:549-557.
6. Belt E, Turner RD. A study of 229 consecutive cases of total perineal prostatectomy for cancer of the prostate. *J Urol* 1957;77:62-77.