19 Extraperitoneal Robot-Assisted Radical Prostatectomy

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Patient Selection

During RARP, one may gain access to the prostate transperitoneally or extraperitoneally, and certain patient and/or disease factors may favor a given approach. With similar safety profiles, surgeons are encouraged to add both techniques to their armamentarium in order to most effectively individualize patient care [1, 2].

In patients who have had extensive prior intra-abdominal surgery, a transperitoneal RARP often requires early adhesiolysis, risking visceral injury. Such an injury may occur in the surgical field or away from the operative site during blind passage of instruments through an assistant trocar. Thus, an extraperitoneal approach can be quite advantageous in this setting. Further, this approach risks the development of de novo intra-abdominal adhesions, which can cause mechanical bowel obstruction and complicate future intra-abdominal surgery.

With the extraperitoneal approach, the peritoneum serves as a natural retractor of the bowels such that steep Trendelenburg may be avoided. This can be quite beneficial, especially in the obese, and in patients with chronic obstructive pulmonary disease [3, 4]. Urine leaks and bleeding become less of a concern after extraperitoneal RARP as an intact peritoneum can limit their spread and hasten their resolution. This technique may also decrease postoperative ileus [5, 6].

In the patient with a history of prior extraperitoneal surgery, particularly mesh herniorrhaphy, an inflammatory reaction may ensue and obliterate the extraperitoneal space. This can make both the RARP and concomitant lymph node dissection difficult, if not impossible when performed extraperitoneally [7, 8]. Patients who have had prior abdominal surgery with incisions extending to the pubic symphysis might also be best served with a transperitoneal RARP as the extraperitoneal space may be scarred or obliterated. Other noted challenges with the extraperitoneal approach include a limited working space and difficulty creating space laterally to use the fourth arm. The confined space keeps the specimen bag in the operative field, potentially impairing visibility during the vesicourethral anastomosis stage [2, 9]. Moreover, lymphocele formation after pelvic lymphadenectomy may be more common

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with extraperitoneal RARP [10]. Inadvertent peritoneotomies made during the procedure may cause transperitoneal insufflation, further compressing the extraperitoneal space and rendering the procedure more difficult.

Preoperative Preparation

All patients receive a bowel preparation consisting of one bottle of magnesium citrate, doses of neomycin, metronidazole, and an enema the day before surgery. They are admitted to the hospital 2 h prior to surgery. Broad-spectrum intravenous antibiotics and 5000 U subcutaneous heparin are administered 1 h before incision. We do not recommend routine donation of autologous blood since our transfusion rate is insignificant.

Operative Setup

The location of the surgical console, bedside surgical cart, and the assistants are as shown (Fig. 19.1).

Patient Positioning

The patient is placed supine on a split-leg bed on top of a surgical bean bag. The legs are abducted slightly and secured to the table. The arms are internally rotated, placed parallel to the long axis of the patient, and secured in foam to avoid pressure sores or neuropraxia. Any hair on the patient's abdomen within the surgical field is trimmed with an electrical shaver. The surgical bean bag is manually molded to conform to the patient's body shape and air is suctioned from the device to secure the patient in place (Fig. 19.2). A digital rectal examination is performed for intraoperative clinical staging and to help with planning for subsequent nerve sparing. An Opium and Belladonna rectal suppository is administered to help prevent bladder spasms postoperatively. Orogastric tube and sterile urethral catheter placement are done prior to trocar insertion. Trendelenburg positioning is generally at about 10°. The patient's abdomen, genitals, and perineum are prepped and draped to provide a sterile field.

Trocar Configuration

Once the extraperitoneal space is developed and insufflated (see step 1 below), additional trocars are placed laparoscopically. A total of six trocars are used in a "W" shaped configuration as shown (Fig. 19.3). An 8 mm camera trochar is placed in the paraumbilical location and a 12 mm assistant trochar is placed 5 cm cephalad and just medial to the right anerior superior iliac spine. Three 8 mm trochars are placed under direct vision: one approximately 5 mm cephalad and just medial to the left anterior superior iliac spine, two in the middle of each rectus belly about 3 cm caudad to the umbillicus (taking great care to avoid injuring the epigastric vessels). A 5 mm assistant trochar is placed between the umbillicus and the right 8 mm trochar, approximately 3 cm cephalad to the umbillicus. The following technique will be based upon this operative arrangement and personnel.

Instrumentation and Equipment List

Equipment

- da Vinci® S Surgical System (4-arm system; Intuitive Surgical, Inc., Sunnyvale, CA)
- EndoWrist® Maryland bipolar forceps or (Intuitive Surgical, Inc., Sunnyvale, CA)
- EndoWrist® curved monopolar scissors (Intuitive Surgical, Inc., Sunnyvale, CA)
- EndoWrist® ProGrasp™ forceps (Intuitive Surgical, Inc., Sunnyvale, CA)

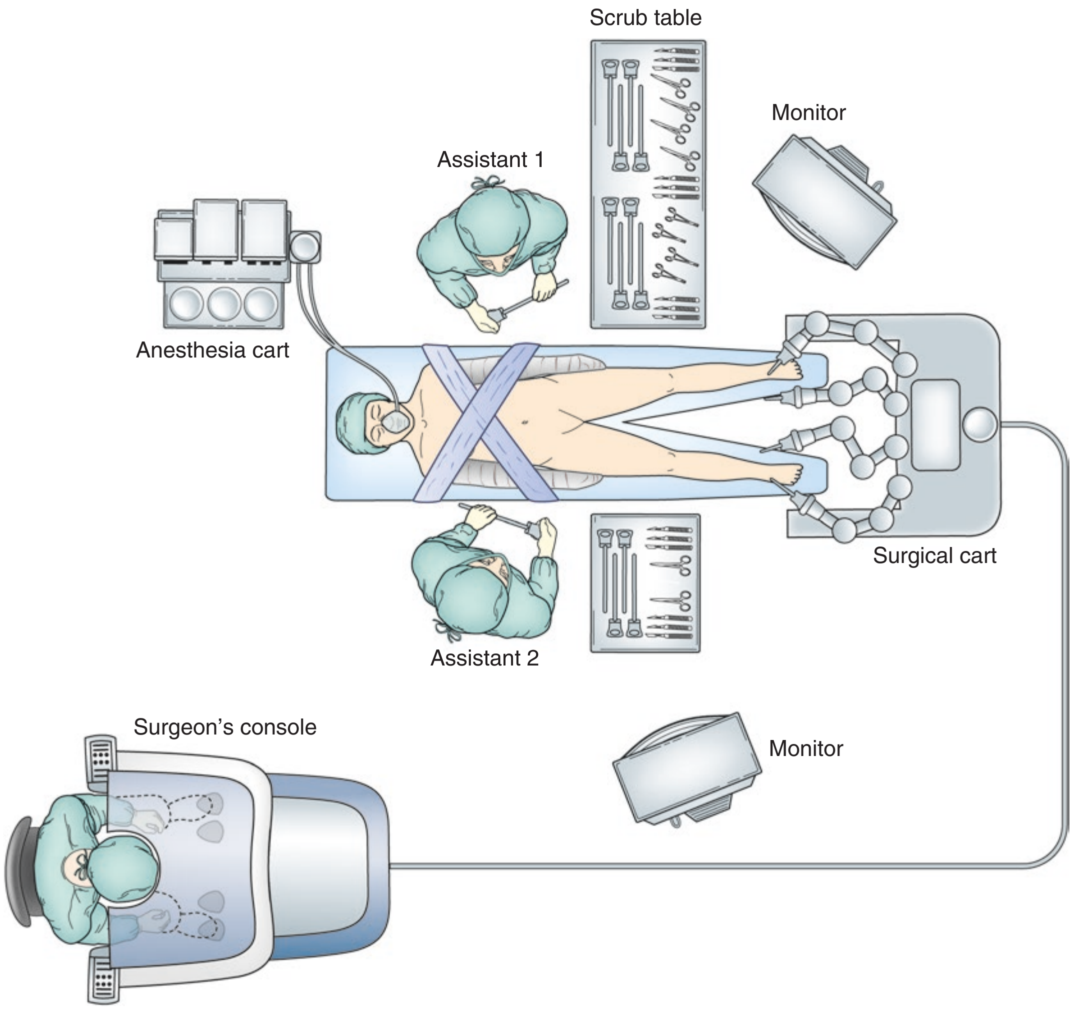

Fig. 19.1 View of operative setup

- EndoWrist® needle drivers (2) (Intuitive Surgical, Inc., Sunnyvale, CA)
- InSite® Vision System with 0° and 30° lens (Intuitive Surgical, Inc., Sunnyvale, CA)

Trocars

- 12 mm trocar (1)
- 8 mm robotic trocars (4)
- 5 mm trocar (1)

Recommended Sutures

- Ligation of the deep dorsal vein complex (DVC): 2-0 Covidien V-Loc™ barbed suture (Medtronic, Minneapolis, MN) cut to 9 in., and 2-0 polyglactin suture on a RB1 needle cut to 6 in. (if necessary)
- Vesicourethral anastomosis: 2 (2-0 polyglactin) sutures (9 in. each) on a RB1 needle
- Posterior reconstruction stitch: 2-0 polyglactin suture on a RB1 needle cut to 9 in.

Fig. 19.2 The patient is secured to the table with a surgical bean bag and placed in mild Trendelenburg. The legs are taped below the knees to the abducted limbs of the split-leg surgical bed

Fig. 19.3 "W" configuration of trocars are shown. Numbers marked on patient's abdomen refer to size of trocar size (in French units) placed after insufflation

- Anterior bladder neck closure (if necessary): 2-0 polyglactin suture on a RB1 needle cut to 9 in.

Instruments Used by the Surgical Assistant

- Laparoscopic scissors
- Blunt tip grasper
- Suction irrigator device
- Hem-o-lok® clip applier (Teleflex Medical, Research Triangle Park, NC)
- Large Hem-o-lok® clips (Teleflex Medical, Research Triangle Park, NC)
- 10 mm specimen entrapment sac
- EnSeal® device 5 mm diameter, 45 cm shaft length (SurgRx®, Redwood City, CA) (optional)
- SURGICEL® hemostatic gauze (Ethicon, Inc., Cincinnati, OH)
- 20 Fr silicone urethral catheter
- Jackson–Pratt closed suction pelvic drain

Step-by-Step Technique (Videos 19.1, 19.2, 19.3, 19.4, 19.5, 19.6, 19.7, 19.8, and 19.9)

Step 1: Creation of Extraperitoneal Space

The initial step of extraperitoneal robot-assisted laparoscopic radical prostatectomy (RALP) is creation of the extraperitoneal space. A 2.5 cm paraumbilical skin incision is made down to the level of the anterior rectus sheath. A 1 cm incision is made in the latter to expose the rectus muscle. A 0-polyglactin suture is placed through the two apices of this incision and the free ends are secured with a snap (Fig. 19.4). The muscle fibers are pushed laterally using a clamp, exposing the posterior rectus sheath. A balloon dilator (Extra View™ Balloon, OMS-XB 2, Tyco Healthcare, Norwalk, CT) is inserted just above the posterior sheath and advanced down to the pubic symphysis in the midline (Fig. 19.5). A 0° scope is placed in the balloon trocar to allow direct visualization of the space being created. Care should be taken not to overstretch or tear the epigastric or iliac vessels from overinflation. Once the space is created, the balloon dilator is replaced by a 10/12 mm Dilating Tip Ethicon

Fig. 19.4 A 2.5 cm paraumbilical skin incision is made down to the level of the anterior rectus sheath. A 1 cm incision is made through the anterior rectus sheath and a 0-polyglactin suture is placed through the two apices and secured with a snap

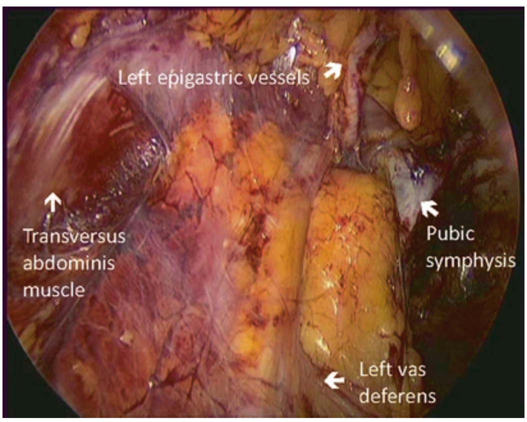

Fig. 19.5 View of left pelvis following balloon dilation of extraperitoneal space

Endopath 512XD (Ethicon Inc. US, LLC., Somerville, NJ) trocar. It is necessary to use a transparent trocar such as this so that the retropubic space can be developed under direct vision. The retroperitoneum is insufflated up to 12–15 mmHg. The beveled tip of the trocar is used to further create the extraperitoneal space laterally, facilitating placement of the assistant trocars as mentioned above. The loose areolar tissue is swept laterally and cephalad, bluntly pushing the peritoneum off the abdominal wall. The epigastric vessels are left attached to the anterior abdominal wall to avoid bleeding from branches

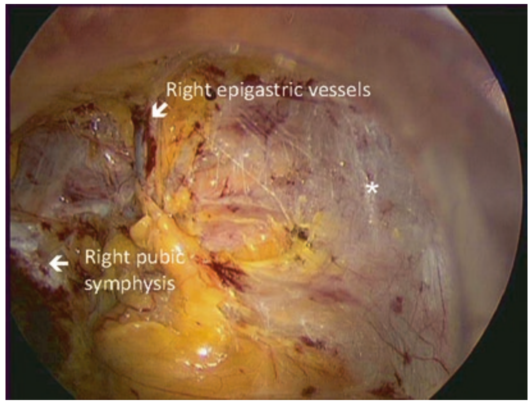

Fig. 19.6 View of right pelvis following balloon dilation of extraperitoneal space. *Asterisk* denotes loose alveolar connective tissue where blunt dissection is carried out in an anterior cephalad direction to push the peritoneum away and expose the transversus abdominis muscle

entering the rectus muscle (Fig. 19.6). If a da Vinci® Xi Surgical System is used, the 12 mm paraumbilical Ethicon Endopath 512XD trocar must be replaced with a 12 mm da Vinci® trocar with a reducer placed on its hub to accommodate an 8 mm, 0° laparoscopic camera. A petroleum jelly-impregnated gauze is wrapped around the trocar at the level of the anterior rectus sheath and the previously placed 0-polyglactin is tied tightly around the trocar to avoid leakage of CO_2. The additional trochars are then placed under direct vision as described above.

Step 2: Endopelvic Fascia Dissection (Table 19.1)

A 0° lens is used throughout the entire operation. Monopolar and bipolar electrocautery settings are set to 90 and 30 W, respectively. Accessing the retropubic space by the extraperitoneal approach described above eliminates the bladder "take-down" step required during the transperitoneal approach, and allows rapid visualization and access to the prostate, endopelvic fascia, and puboprostatic ligaments (Fig. 19.7). The fatty tissue overlying the endopelvic fascia is easily swept away exposing the prostate. We routinely incise the endopelvic fascia, freeing the prostate from its lateral attachments. Accessory pudendal vessels, if

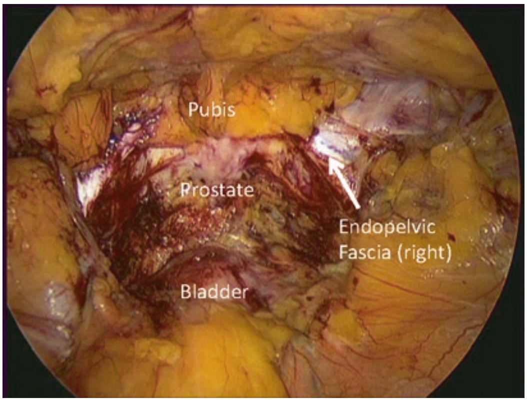

Fig. 19.7 Complete view of the pelvis including the pubis, prostate, bladder, and endopelvic fascia following balloon dilation of the extraperitoneal space

present, are identified and preserved. We routinely incise the puboprostatic ligaments to allow adequate mobilization of the prostatic apex. Superficial vessels encountered are cauterized.

Step 3: Dorsal Vein Ligation (Table 19.2)

A 2-0 Covidien V-Loc™ barbed suture is used to ligate the dorsal venous complex (DVC). With medial retraction of the prostatic apex, a groove is visualized between the DVC and the anterior urethra. We routinely pass the needle three times through this plane and suspend the complex to periosteum of the pubic symphysis after the first and third pass. A Hem-o-lok® clip is applied to the distal end of the suture and used to further cinch it to the pubic symphysis (Fig. 19.8).

Step 4: Bladder Neck Dissection (Table 19.3)

With cephalad tension on the bladder, the loose areolar connective tissue crossing the bladder neck is removed allowing identification of the bladder neck (Fig. 19.9). With the magnification afforded by the da Vinci® robot, the plane between the prostate and bladder neck is easily identified. A combination of electrocautery and blunt dissection

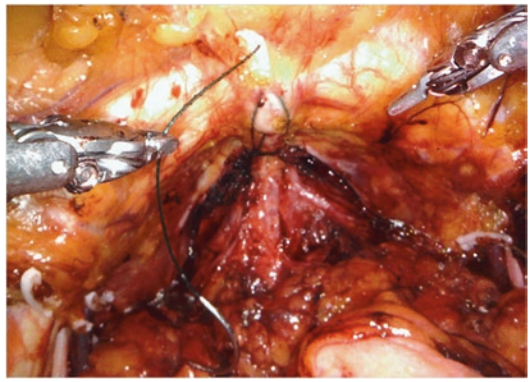

Fig. 19.8 Control of the DVC with a 2-0 Covidien V-Loc™ barbed suture

allows separation of the bladder from the prostate. Judicious use of electrocautery is necessary to avoid excessive charring and obliteration of the tissue planes. Given the lack of tactile feedback, following the tissue planes allows an accurate anatomical dissection, without violation of the prostate capsule. Once the longitudinal urethral fibers are identified, the bladder neck is transected (Fig. 19.10). The previously placed urethral catheter is removed allowing access to the posterior bladder neck. The transection is done sharply, with no significant bleeding encountered. If a bleeding vessel is present, it can be selectively cauterized avoiding the bladder neck mucosa. The anatomical groove between the bladder and prostate is further dissected, pushing the bladder cephalad. The bladder neck dissection is completed with the identification of the longitudinal muscle fibers coursing posterior to the bladder, covering the seminal vesicles (SVs) (Fig. 19.11).

Step 5: Seminal Vesicle Dissection (Table 19.4)

Once the longitudinal fibers are transected, the ampullae of the vasa and attached SVs are identified. These fibers need to be incised transversely in the midline allowing identification of both vasa. Once the ampullae are fully identified, the fourth arm can also be used to elevate the attached SVs. Optimal traction is achieved by pulling the vas toward the contralateral pubic bone. The dissec-

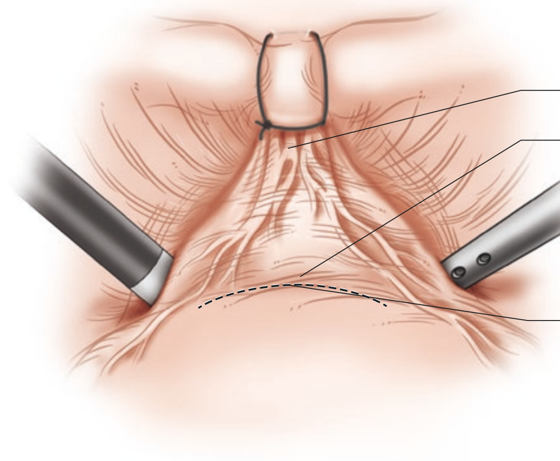

Fig. 19.9 View of bladder neck (*dashed line*) following control of distal DVC, with traction placed on the perivesical fat

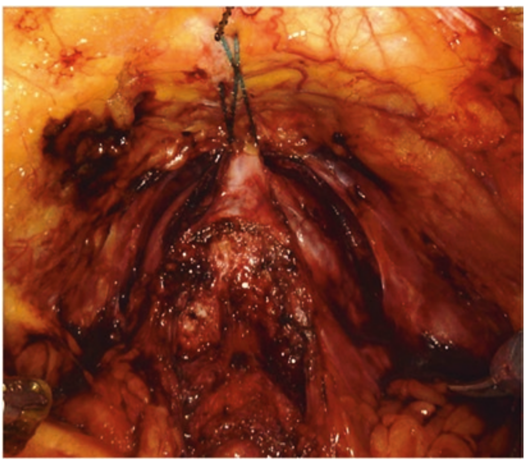

Fig. 19.10 View of longitudinal urethral fibers prior to bladder neck transection

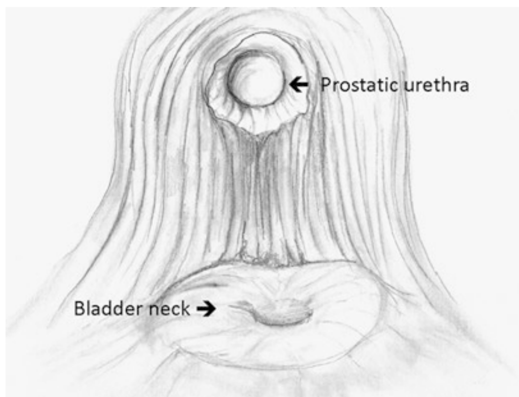

Fig. 19.11 View of bladder neck following transection

Table 19.1 Endopelvic fascia dissection: surgeon and assistant instrumentation

Surgeon instrumentation			Assistant instrumentation
Right arm	**Left arm**	**Fourth arm**	• Suction-irrigator
• Curved monopolar scissors	• Maryland bipolar grasper	• ProGrasp™ forceps	
Endoscope lens: 0°			

Table 19.2 Dorsal vein ligation: surgeon and assistant instrumentation

Surgeon instrumentation			Assistant instrumentation
Right arm	**Left arm**	**Fourth arm**	• Suction-irrigator
• Needle driver	• Needle driver	• ProGrasp™ forceps	• Laparoscopic scissors
			• Laparoscopic needle driver
Endoscope lens: 0°			

Table 19.3 Bladder neck dissection: surgeon and assistant instrumentation

Surgeon instrumentation			Assistant instrumentation
Right arm	**Left arm**	**Fourth arm**	• Suction-irrigator
• Curved monopolar scissors	• Maryland bipolar grasper	• ProGrasp™ forceps	
Endoscope lens: 0°			

Table 19.4 Seminal vesicle dissection: surgeon and assistant instrumentation

Surgeon instrumentation			Assistant instrumentation
Right arm	**Left arm**	**Fourth arm**	• Suction-irrigator
• Curved monopolar scissors	• Maryland bipolar grasper	• ProGrasp™ forceps	• Hemoclip applier
Endoscope lens: 0°			

tion should be carried cephalad to the tip of the SVs. Dissecting in a caudal direction will inadvertently enter the posterior aspect of the prostate. It is helpful to avoid directly grasping or traumatizing the SVs, since that will alter the dissection plane. Instead, leaving the SVs attached to their respective ampullae helps with retraction of both structures by grasping only the ampulla. The artery to the vas located between the SVs and the vas deferens is clipped en bloc. When performing a nerve-sparing procedure, electrocautery is avoided to prevent damage to the nerve plexus traveling near the tip of the SVs.

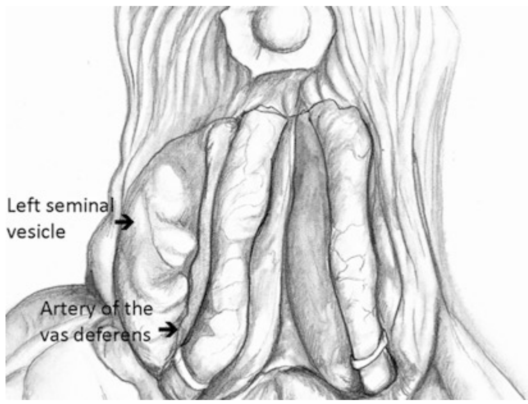

Fig. 19.12 Seminal vesicles with clipped ampulla

Step 6: Posterior Prostate Dissection

Once the SVs are completely dissected, both ampullae are retracted anteriorly exposing Denonvilliers' fascia (Fig. 19.12). The latter is incised transversely, exposing the yellow perirectal fat. The assistant uses the suction to gently retract the rectal wall in a cephalad direction. The rectal wall is pushed bluntly from the posterior aspect of the prostate all the way to the prostate apex. If the latter is not possible due to a very enlarged gland, this step can be carried out once the posterior prostate pedicles are mobilized. It is important to note that the rectal wall is being pulled anteriorly with the traction on the prostate or SVs. The caudad dissection should be carried out parallel to the posterior prostate to avoid injury to the rectal wall. A rectal bougie or an assistant's finger can be used to help delineate the rectal wall if necessary. This dissection is carried out primarily in the midline, avoiding trauma to the laterally located neurovascular bundles (NVBs).

Step 7: Neurovascular Bundle Dissection

The ampullae and SVs are pulled medially in the opposite direction from the side being dissected. Using the suction, the assistant can place traction on Denonvilliers' fascia posterior to the bladder, allowing better visualization of the bundles. In patients selected for nerve sparing, the prostate capsule is exposed bluntly using graspers to push off the overlying fat and periprostatic fascia. With further lateral dissection, arterial pulsations from the cavernous vessels within the NVBs are easily noted. These vessels are preserved by gently pushing them posterolaterally toward the rectum. Dissecting in a cephalad direction helps identify the main neurovascular trunks, bifurcating in anterior branches entering the prostate, and the posteriorly located NVBs coursing toward the pelvic diaphragm and toward the corpora cavernosum.

Prior to clipping the prostatic branches, the levator fascia is incised allowing improved identification of the lateral aspects of the NVBs. As for the posterior dissection, this can be carried out bluntly with minimal bleeding encountered. Dissection in a medial direction leads to the previously dissected anterior rectal space, with the NVBs mobilized posteriorly. Clips can be selectively applied, in lieu of electrocautery, to the vascular branches of the prostatic pedicles prior to their transection (Fig. 19.13). Once the prostatic pedicles are transected, the periprostatic fascia encompassing the NVBs can be detached bluntly from the prostate, in a caudal direction all the way to the prostatic apex.

In non-nerve-sparing cases, the periprostatic fascia is incised next to levator ani. The bundles and their investing fascia are left attached to the prostate capsule, allowing for wide excision of the NVBs along with the prostate.

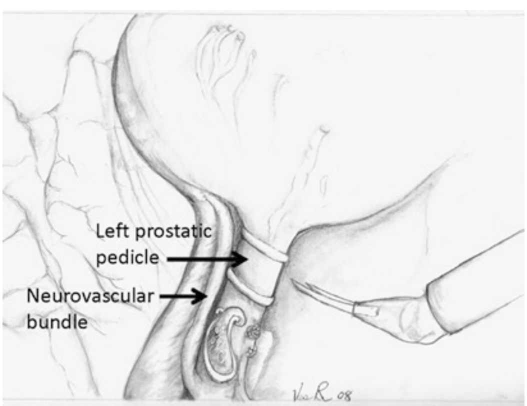

Fig. 19.13 Hem-o-lok® clips used to control the prostatic pedicle, while leaving the NVBs intact, coursing posterior to the prostate to enter the pelvic diaphragm

Step 8: Apical Dissection

With the prostate retracted in a postero-cephalad direction, the DVC is transected (Fig. 19.14). A urethral catheter should be inserted in the urethra to facilitate identification of the urethral stump. Electrocautery should be avoided in order not to damage the NVBs coursing lateral to the prostatic apex. Care should be taken not to enter the prostate at this point. This is best achieved by following the normal curvature of the apex, transecting the vein in a caudal direction. A perpendicular dissection plane inevitably will enter the prostate gland. If bleeding is encountered or the previously placed DVC suture is dislodged, additional sutures are placed on the DVC, using 2-0 polyglactin suture on a RB1 needle, to achieve hemostasis. Temporary increase in intra-abdominal pressure up to 20 mmHg facilitates completion of the DVC transection when profuse bleeding from venous sinuses is present.

Step 9: Urethral Transection

With the urethral catheter in place, the longitudinal anterior urethral fibers can be identified. The urethra is dissected cephalad, close to the prostate and transected. Urethral length should be preserved without compromising cancer control

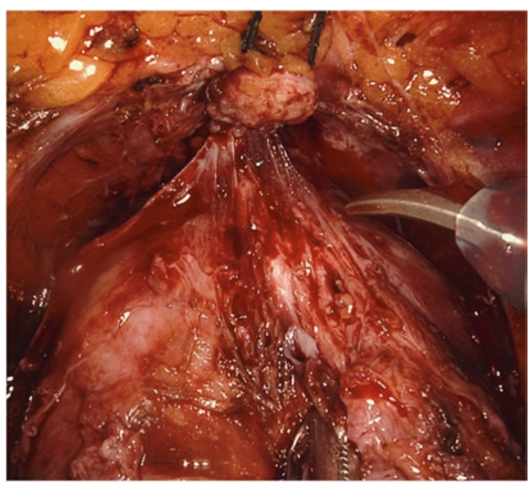

Fig. 19.14 View of prostatic apex following DVC transection, prior to urethral transection

at the apex. Once the urethral catheter is exposed, it is retracted by the assistant, facilitating visualization and transection of the posterior urethra (Fig. 19.15). We prefer cutting the urethra sharply to avoid ischemic mucosal injury that can occur with the use of electrocautery.

The prostate is then retracted in an anterior and cephalad direction to allow visualization of the posterior apex. The NVB should be thoroughly dissected, pushed in a posterolateral direction prior to transecting the remaining posterior apical attachments. The prostate is placed in a 10 mm ENDO CATCH™ bag (Covidien, Mansfield, MA), which is pulled out of the pelvis and stored out of the operative field in the abdomen until the end of the operation. The prostate fossa is irrigated and inspected for hemostasis and integrity of the rectal wall. When arterial bleeding is noted from the NVB, the bleeding vessel is selectively controlled using 2-0 polyglactin suture ligatures. If a rectal injury is suspected, a finger or rectal bougie is placed to tent the rectal wall to allow a thorough examination.

Step 10: Posterior Reconstruction (Table 19.5)

A posterior reconstruction is routinely performed prior to completing the vesicourethral anastomosis. In one step, the posterior layer of the rhabdosphincter is sewn to Denonvilliers' fascia and the posterior aspect of the bladder using two interrupted Covidien V-Loc™ barbed sutures. The posterior bladder tissue encompassed is the longitudinal fibrous layer which previously covered the anterior aspect of the SVs (Fig. 19.16). The insufflation pressure in the retroperitoneum is lowered to 8–10 mmHg, while pressure is applied to the perineum to facilitate tying of these two interrupted sutures. This reconstructed layer helps bring the bladder and urethra in close proximity in preparation for the vesicourethral anastomosis. After cinching these sutures, the bladder is brought in close proximity to the transected urethra, greatly reducing tension on the anastomosis. The needle ends of the two Covidien V-Loc™ barbed sutures are left loose and temporarily tucked away lateral to the bladder for later use.

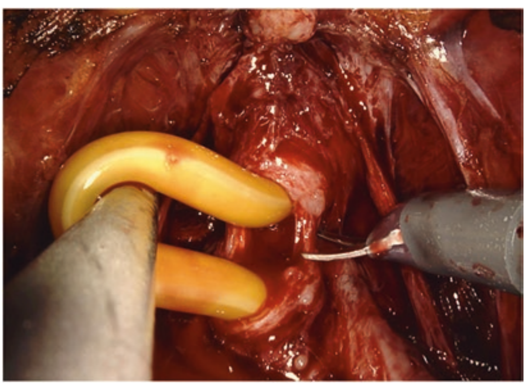

Fig. 19.15 View of the posterior urethra prior to transection

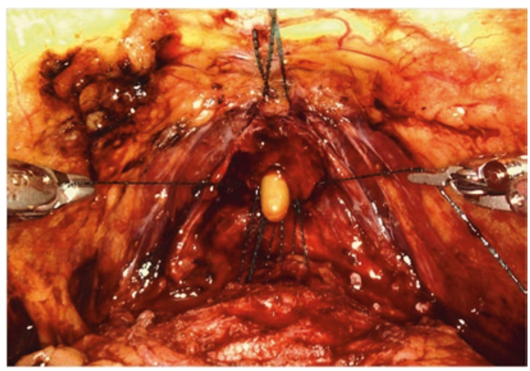

Fig. 19.16 The bladder is pulled towards the transected urethra using as part of the posterior reconstruction

Table 19.5 Posterior reconstruction: surgeon and assistant instrumentation

Surgeon instrumentation			Assistant instrumentation
Right arm	**Left arm**	**Fourth arm**	• Suction-irrigator
• Needle driver	• Needle driver	• ProGrasp™ forceps	• Laparoscopic scissors
			• Laparoscopic needle driver
Endoscope lens: 0°			

Step 11: Vesicourethral Anastomosis

The anastomosis is completed using two separate sutures (2-0 polyglactin suture on an RB1 needle). The first suture is placed at the 5 o'clock position approximating the bladder neck and urethra using the right hand (forehand on both bladder and urethra). Urethral sutures are placed while the assistant withdraws the urethral catheter exposing the urethral mucosa. Initially, the anastomosis is carried out in a clockwise fashion to the 7 o'clock position when the needle placement is done using right hand (backhand) on the urethra, and left hand (forehand) on the bladder. This suture is tied to itself at the 11 o'clock position. The second suture is carried out in a counterclockwise direction completing the anterior wall of the anastomosis. The 5–1 o'clock locations are done using the right hand (forehand) on the bladder, and the left hand (backhand) on the urethra. The anterior-most aspect of the anastomosis (1–11 o'clock) is accomplished using the right hand (backhand) on the bladder, and the left hand (backhand) on the urethra. The second suture is also tied at the 11 o'clock position. Bladder neck mucosa is encompassed into every suture to facilitate mucosal apposition. Care should be taken for the suture not to pass through the posterior bladder neck mucosa, while placing the anterior bladder sutures. Once the anastomosis is completed, a new 20 Fr urethral catheter is inserted into the bladder under direct vision, prior to cinching the second counterclockwise anastomotic suture (Fig. 19.17). When cinching this suture, it is best to pull on the urethral side of the anastomosis, in a direction perpendicular to the longitudinal urethral fibers. This maneuver avoids shearing the urethral wall, while achieving water tightness of the anastomosis. The urethral catheter is irrigated verifying absence of anastomotic leakage. Once the vesicourethral anastomosis is complete, the catheter is flushed both to confirm the absence of a significant leak and to irrigate clots from the bladder. Attention is then turned to the two needle ends of the previously placed posterior reconstruction Covidien V-Loc™ barbed sutures. These needles are passed through the pectineal ligament, approximately 3 cm lateral to the midline, the sutures are held with a moderate amount of tension and two Hem-o-lok® clips are applied to the distal ends of both in order to cinch them down firmly (Fig. 19.18). Our group believes that this step may aid in the prevention of postoperative urinary incontinence by acting as a prophylactic male urinary sling.

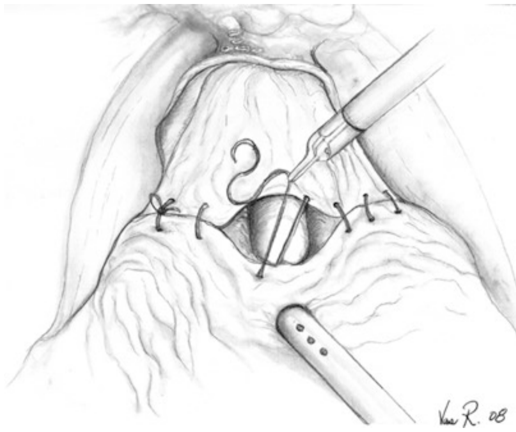

Fig. 19.17 View of the vesicourethral anastomosis. Final urethral catheter is passed into the bladder prior to cinching the anterior anastomotic suture

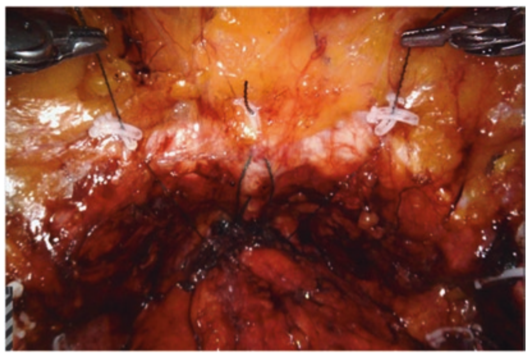

Fig. 19.18 After completion of the vesicourethral anastomosis, the two previously placed posterior reconstruction sutures are passed through the pectineal ligaments bilaterally and cinched with Hem-o-lok® clips

Step 12: Delivery of the Specimens and Exiting the Abdomen

The surgical cart is disconnected from the trocars and wheeled away from the patient. The specimen bag is retrieved from the periumbilical camera tro-

Fig. 19.19 Specimen retrieval through the previously created periumbilical incision

car at the end of the procedure (Fig. 19.19). A 19 Fr Jackson-Pratt (JP) drain is placed in the retropubic space via the 10 mm lateral assistant trocar site and subsequently secured to the skin. The robotic trocars are removed under vision, verifying hemostasis from the exit sites. The anterior rectus sheath adjacent to the midline fascia is incised to allow withdrawal of the bag. The anterior rectus fascia opening is closed using absorbable sutures. All skin openings are later closed in a similar manner. With the extraperitoneal approach, no other fascial closure is necessary. In conditions where air is trapped into the peritoneal cavity, it is evacuated with a small opening in the posterior sheath and peritoneum, which is later closed.

Postoperative Management

Postoperative pain management consists of ketorolac, and morphine sulfate for breakthrough pain. We do not use ketorolac in patients with bleeding diathesis or abnormal renal function. Two additional doses of 5000 U of subcutaneous heparin are administered postoperatively following the initial preoperative dose. Patients are ambulated and fed once they fully recover from anesthesia. They are generally discharged within 23 h of surgery. Jackson–Pratt drains are removed before discharge if the output remains low with less than 30 cm^3 in an 8 h shift. The urethral catheter is removed in the outpatient setting 7–10 days after surgery. We perform cystograms only in patients with gross hematuria, or prolong JP drainage, to verify the integrity of the anastomosis prior to instituting a void trial.

Special Considerations

Obesity

In the obese patient, we favour an extraperitoneal approach to RARP for a variety of reasons. The peritoneum serves as an excellent natural retractor which keeps the bowels out of the operative field. Furthermore, the steep Trendelenburg position, which may be associated with anesthetic complications in an obese patient due to diaphragmatic splinting, is not necessary Laryngeal and facial edema associated with the steep Trendelenburg position may otherwise lead to delayed extubation and a prolonged recovery.

Large Prostate Gland

A large gland may be difficult to manipulate during extirpation, especially when associated with a narrow pelvis. The posterior apical dissection may be challenging due to inability to lift the prostate anteriorly to reach the posterior aspect of the prostate apex. Anterior mobility of the prostate is limited by the pubic symphysis. In such cases, the posterior dissection is best completed following dissection of the apex and transection of the urethra.

Steps to Avoid Complications

Bleeding is the most common complication encountered during the development of the extraperitoneal space. Balloon insufflation should be carried out under direct vision to avoid stretching or tearing of the epigastric or iliac vessel. The epigastric vessels give off several perforators entering the rectus muscles which can be injured during creation of the extraperitoneal space. Occasionally this may result in tearing of a branch of the epigastric artery which may necessitate clipping. Increasing the pressure in the preperitoneal space may help decrease the bleeding until an additional trocar is inserted to allow clipping of the bleeding vessel. If mild venous bleeding is encountered, which can be from perforating veins or vessels behind the pubic symphysis, it is easily controlled with preperitoneal insufflation. Overcompression of the iliac vessels, impairing flow from the lower extremities, should be avoided.

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