Robotic Prostatectomy

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Introduction

Prostate cancer is the most commonly diagnosed cancer among men in the United States of America. Radical prostatectomy is the most common treatment for localized prostate cancer. The goals of radical prostatectomy are to achieve cancer control, maintain continence, and preserve potency.

Since its introduction in 1999, the da Vinci Surgical System (Intuitive Surgical, Sunnyvale, CA) has become an integral tool in urologic surgery. Robot assistance reduced many of the challenges associated with laparoscopic prostatectomy with the result that Robot-assisted radical prostatectomy was rapidly adopted for the treatment of localized prostate cancer. Currently, more than 75 % of radical prostatectomies are performed robotically.

Advantages of the robotic system include improved ergonomics, wristed instrumentation, and magnified, three-dimensional visualization facilitating suturing and dissection during minimally invasive prostatectomy.

The robotic system consists of three components: the Surgeon Console, Patient Side Cart, and Video Tower. A dedicated robotic team aids in improving surgical efficiency while an assistant skilled in minimally invasive and robotic surgery is important in achieving optimal outcomes in robotic prostatectomy.

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Robotic Prostatectomy Technique

Instruments:
Curved Monopolar Scissors
Bipolar forcep
Prograsp forcep
Suction/Irrigator
Needle Driver
Small bowel grasper
Hemolock clips and applier
Optional:
Harmonic Scalpel

Patient Positioning

After induction of general anesthesia, sequential compression devices are placed on both legs. The patient is then placed in lithotomy position with the arms tucked and padded at the patient's sides. The patient is secured to the bed and the operative table is placed in extreme Trendelenberg position as a stress test to ensure that the patient has been adequately secured.

The patient is then prepped and draped in a sterile fashion. A urethral catheter is placed and

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positioned for easy access by the assistant. A nasogastric tube is placed to decompress the stomach.

Port Placement

A 5-6-port technique is employed. The initial 12 mm trocar is placed at or just superior to the umbilicus. This will serve as the robotic camera port and as the specimen extraction site. Pneumoperitoneum is obtained using a veress needle or an open technique. Insufflation is set to 20 mmHg for port placement and then decreased to 15 mmHg for the remainder of the case. After insertion of the initial 12 mm trocar, a diagnostic laparoscopy is performed to ensure that no vascular or bowel injury has occurred. The remaining ports are then positioned under direct vision. The following 8 mm ports are positioned along a line 2 fingerbreaths below the umbilicus: the port for the right robotic arm is placed just lateral to the right rectus muscle, the port for the left robotic arm just lateral to the left rectus muscle, and the port for the third robotic arm above the left anterior superior iliac spine. Ideally the robotic ports should be separated by 8–9 cm to minimize clashing of the robotic arms. A 12-mm assistant port is placed 2 fingerbreaths above the right anterior iliac spine and if desired another 5 mm port can be placed between the camera port and right robotic arm but 5 cm cranially. In obese patients consideration should be given to using longer ports, whereas in very tall patients port position should be displaced inferiorly (Fig. 6.1).

The patient is then placed in extreme trendelenburg position. The robot is brought in and docked between the patient's legs (Fig. 6.2). The assistant works from the patient's right side.

Developing Space of Retzius

Visualization is initially performed with a 0° endoscope. Dissection is performed with curved monopolar scissors in the right robotic arm and bipolar forcep in the left robotic arm. The fourth robotic arm controls a grasper, such as a Prograsp forcep, and is used for grasping and retracting tissues.

To retract bowel from the surgical field and to help expose the lymph node packets, adhesions between the bowel and peritoneum are released. This most commonly is required on the left side where the sigmoid colon is released from the lateral peritoneum.

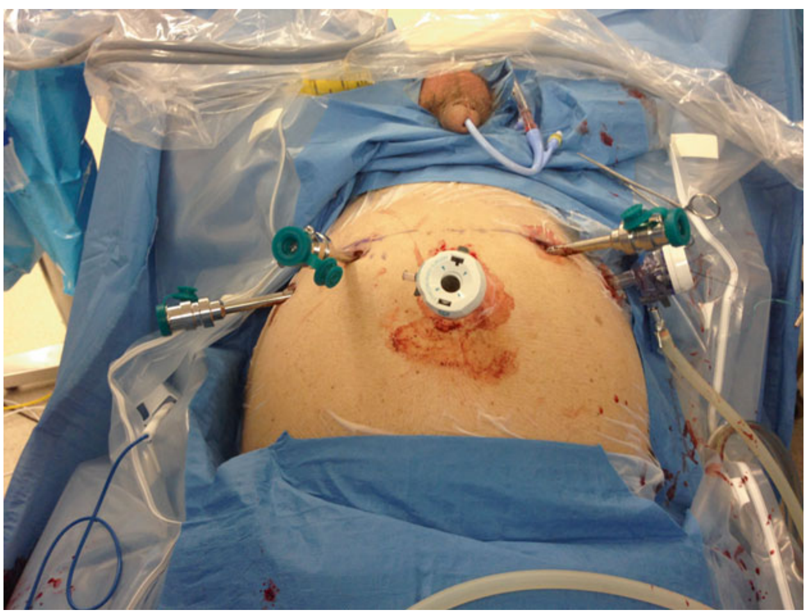

Fig. 6.1 Port position

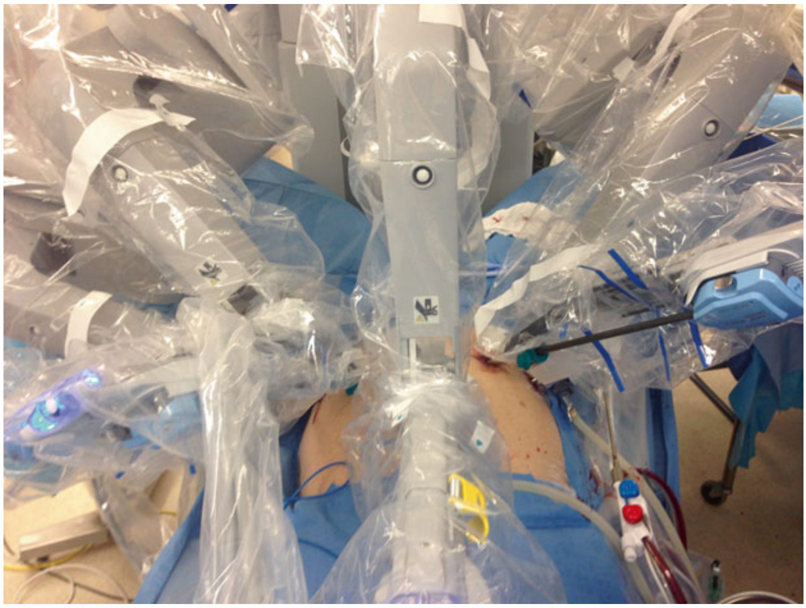

Fig. 6.2 Docking of robot

After transperitoneal access, the space of Retzius is developed and the dissection performed by an anterior technique. The bladder is dissected from the anterior abdominal wall by incising the peritoneum lateral to the medial umbilical ligaments. This incision is carried superiorly to the level of the umbilicus and inferolaterally to the level of the Vas Deferens. Care should be taken to avoid injury to the inferior epigastric vessels, which can cause troublesome bleeding or to carrying the dissection too far laterally in which case inadvertent entry into the iliac vessels may occur. The urachus is divided high above the bladder thus avoiding the presence of unnecessary tissue obstructing the field of view.

The plane between the bladder and anterior abdominal wall is then developed using a combination of blunt and sharp dissection. The correct plane is composed of fibrofatty tissue and is relatively avascular. Posterior traction on the bladder with the fourth robotic arm helps to correctly identify this tissue plane. If one is in the correct plane, one should see the pubic bone anteriorly. This dissection is continued inferiorly until the Endopelvic fascia is identified. Mobilization of the bladder is a key step in prostatectomy as it allows for a tension-free urethrovesical anastomosis to be performed.

The preceding technique, the Anterior Transperitoneal, is the most common approach to robotic prostatectomy. Another approach is the Transperitoneal Retrovesical approach in which the seminal vesicles and vas deferens are dissected first followed by bladder mobilization. Alternatively, an Extraperitoneal approach is also described but tends to be less commonly performed due to the smaller working space.

Opening Endopelvic Fascia

After release and mobilization of the bladder, the fat overlying the prostate is removed. Within this tissue lies the Superficial Dorsal Vein. It will usually lie in the midline and can lead to significant bleeding if not adequately coagulated.

At this point the endopelvic fascia and puboprostatic ligaments should be visible. Starting on the right side, the prostate is retracted medially. Opening of the endopelvic fascia is performed athermally using scissors towards the base of the prostate where the prostate is more mobile. This incision is then carried towards the apex of the prostate. The levator fibers are gently pushed away from the lateral and apical portions of the prostate (Fig. 6.3). The correct plane is avascular.

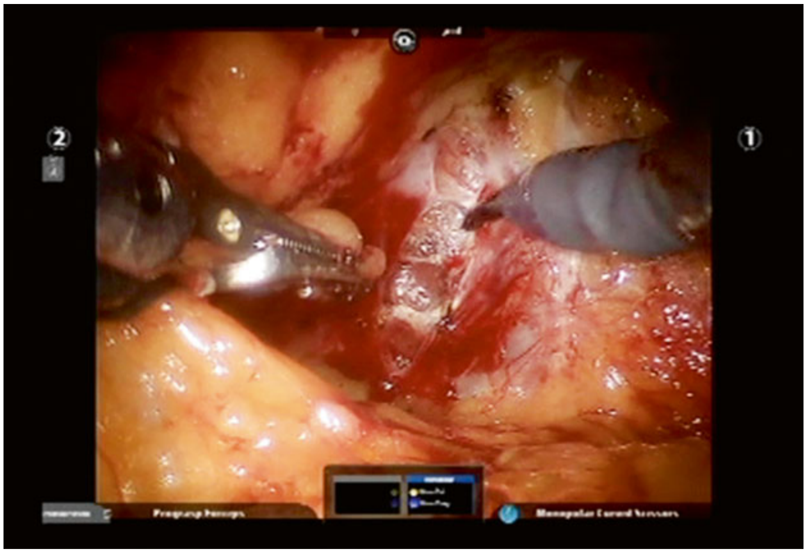

Fig. 6.3 Opening of endopelvic fascia

If bleeding is encountered this raises the possibility that one is dissecting through the levator fibers.

Towards the apex of the prostate, the puboprostatic ligaments are divided. In this area, the levator fibers may coalesce into a band of tissue requiring sharp dissection to free up the apical prostate.

The apical dissection proceeds until one identifies a notch between the dorsal venous complex anteriorly and the urethra posteriorly. A similar procedure is then repeated on the left side.

When excising the periprostatic fat or opening the endopelvic fascia, an Accessory Pudendal Artery may be encountered. When possible these arteries should be preserved. These may arise laterally coursing along the prostate, coursing above or below the endopelvic fascia or from an apical location. While these appear to be entering the prostate, they can often be dissected off the prostate using sharp dissection and bipolar cautery. Towards the apex they are in close association with the dorsal venous complex and prone to lead to venous oozing. Therefore, before performing this distal dissection, it may be wise to open the contralateral endopelvic fascia such that in case bleeding is encountered, one is prepared to suture ligate the complex. Apical dissection of Accessory Pudendal arteries proceeds until proximal suture ligation of the dorsal venous complex can be performed.

Ligation of Dorsal Venous Complex/ Anterior Urethra Suspension

Various techniques have been described to control the dorsal venous complex. The complex can be suture-ligated with a 0-PDS suture on a CT-1 needle. The bladder is grasped with the fourth robotic arm and placed on cephalad traction. The notch between the dorsal venous complex and urethra is identified. The suture is passed anterior to the urethra (Fig. 6.4). After passage of the suture, both ends are grasped. The assistant then pushes the urethral catheter in/out to ensure that the suture has not caught the catheter. A second throw of the suture can then be performed and the complex secured with a square knot. Alternatively, after a single throw, a slipknot can be laid down to control the complex.

Another technique to control the dorsal vein involves the use of a laparoscopic stapling device. Conversely, while some techniques advise dividing the dorsal vein and suturing/stapling only if necessary, care should be taken in using this approach as bleeding can obscure visualization and increase the chance of a positive apical margin.

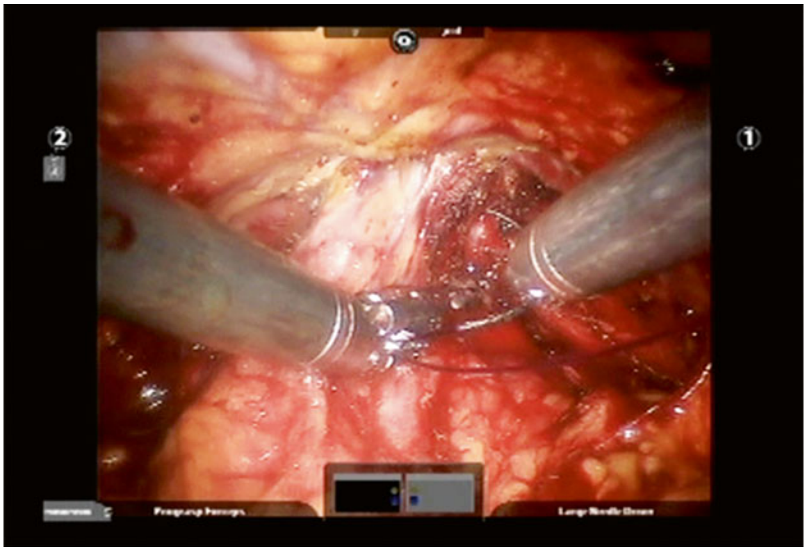

Fig. 6.4 Ligation of the dorsal venous complex

Anterior Bladder Neck

At this point it is helpful to switch to a 30° downward looking lens. While not necessary, this does help with visualization of the posterior bladder neck and during seminal vesicle dissection.

To delineate the correct plane and avoid entry into the prostate, the plane between the prostate and bladder is identified by advancing the urethral catheter in/out and applying gentle inward compression. Otherwise, the fourth arm can be used to tent the bladder anterocranially. Dissection is then initiated where the bladder tenting stops.

A horizontal incision is made in the bladder using monopolar cautery until the urethral catheter is visualized. The incision should not be made too laterally because bleeding from branches of the bladder pedicle can be encountered. The catheter balloon is then deflated and grasped by the fourth robotic arm. Simultaneously, the assistant clamps the catheter over a gauze just distal to the urethral meatus. The catheter is brought through the bladder incision and placed on cephalad retraction to elevate the prostate. Retraction can also be achieved by passing a holding suture through and through the abdominal wall, incorporating the eye of the catheter, and securing it to the outside.

Posterior Bladder Neck/Seminal Vesicle Dissection

Once the bladder is entered, the ureteral orifices are identified. In addition the presence of a median lobe should be ascertained (Fig. 6.5).

A horizontal incision is made in the posterior bladder neck using monopolar cautery. Dissection is carried at a 45° angle to avoid entry into the bladder or prostate. To avoid creation of an inadvertent cystotomy, frequent inspection of the bladder is performed.

Continuing along a 45° angle of dissection, one should identify the vasa deferentia in the midline. The depth of dissection can be estimated by considering that the thickness of the posterior bladder neck should approximate that of the anterior bladder neck. If it does not, or if the vasa deferentia are not encountered, this indicates that the plane of dissection is too superficial and may result in violation of the prostate. Furthermore, significant bleeding encountered in the midline or visualization of prostatic secretions is indicative of entry into the prostate. In each of the above cases, if one suspects entry into the prostate, one returns more cephalad and adjusts the angle of dissection more posteriorly.

If a prostate median lobe is present, division of the lateral bladder neck may be required to

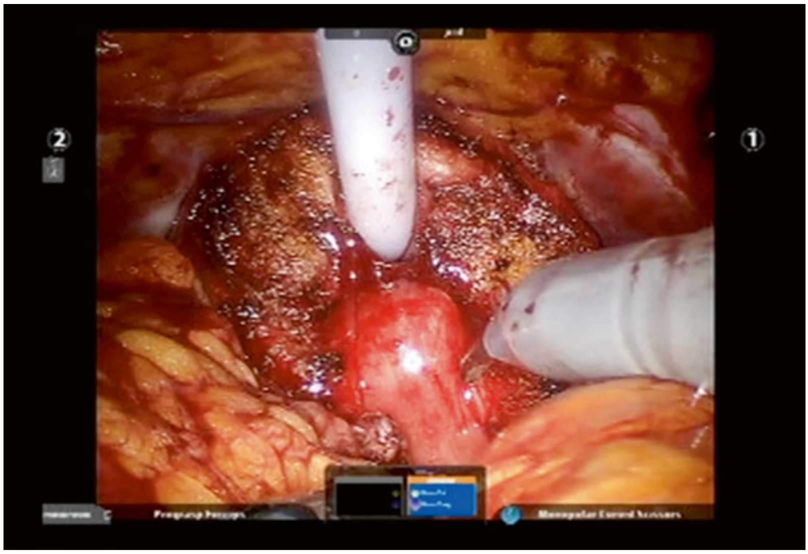

Fig. 6.5 Median lobe of the prostate. Prior to incising the mucosa below the median lobe, both ureteral orifices are identified

visualize beneath the median lobe and the posterior bladder neck. Again in the presence of a median lobe, identification of the ureteral orifices is critical. If required intravenous furosemide and indigo carmine can be administered. To aid with visualization, the median lobe is grasped with the fourth robotic arm and lifted anteriorly. Alternatively a 0 vicryl suture can be placed through the median lobe and lifted anteriorly by the assistant. Dissection must be below the median lobe as dissecting along its contour will result in incomplete resection and the vas and seminal vesicles will not be encountered.

Once the vas are identified, the fourth robotic arm releases traction on the urethral catheter and instead is used to grasp and retract the vas deferens anteriorly. Using blunt dissection the overlying tissue is released further mobilizing the vas. As the vas is lifted, this will bring up the corresponding seminal vesicle.

The arterial supply to the vas deferens typically runs between the vas and medial seminal vesicle. The vas is clipped and divided. The fourth robotic arm is repositioned to hold the proximal end and lifts anteriorly. When holding the vas, the wristed joint of the robotic instrument should be angled inferolaterally to maximize working space. Simultaneously, the assistant grasps the distal end and pulls laterally in the direction of the assistant port. This maneuver aids in visualization and exposure of the seminal vesicles. With the seminal vesicles exposed, the vas is released. The seminal vesicle is now held and lifted anteriorly with the robotic arm angled as described previously. With the seminal vesicle on traction, blunt dissection is used to free the gland proceeding from a medial to lateral direction. The blood supply originates inferolaterally and is controlled with clips. Electrocautery should be avoided as they may result in injury to the neurovascular bundle. After one side has completed, the same procedure is performed on the remaining vas deferens and seminal vesicle.

After both seminal vesicles and vas deferens have been dissected free, they are grasped with the fourth robotic arm and lifted anteriorly to provide exposure for the posterior dissection. Alternatively, they can be grasped on one side with the fourth robotic arm and on the other side by the assistant to provide anterior traction.

An incision is then made in the midline of Denonvilliers fascia and the posterior prostatic contour is defined. A plane is created using blunt and sharp dissection between the prostate and rectum. The correct plane is identified by the visualization of perirectal fat. Dissection is continued towards the apex of the prostate and laterally to thin out the prostate pedicles. Dissection to the apex decreases the chance of rectal injury that may occur with the subsequent apical dissection.

Ligation of Vascular Pedicles

If a nerve sparing procedure is to be performed, thermal energy should be avoided due to propagation to cavernosal nerves.

It is generally easier to start with ligation of the right vascular pedicle because of the better working angles.

Different techniques exist to control the vascular pedicle. These include suture ligation, Bulldog clamps, clips, or coagulation (non-nerve sparing).

The pedicles should be adequately thinned to allow clip application. To aid with clip application, for the right prostatic pedicle the fourth robotic arm grabs the prostate and pulls it to the contralateral side while the assistant provides cephalad traction on the perivesical tissue. This puts the pedicle on stretch rendering it easier to place clips. For the left pedicle the maneuver is reversed with the assistant grabbing the prostate and the fourth robotic arm grabbing the perivesical tissue.

Alternatively, Beck described a technique of tension adjustable ligation of the vascular pedicle using a 6 cm 3-0 poliglecaprone suture on an SH needle. A figure of eight suture is placed 5–8 mm from the base of the prostate and 5–7 mm above the perirectal fat. The needle is then threaded through a preformed loop at the end of the suture. Placing a clip and cinching down on the suture ligature can then apply increasing tension on the suture.

Nerve Sparing

Nerve sparing is performed using a traction-free, athermal technique. The aggressiveness of nerve sparing should take into account a risk-stratified approach. Given that the neurovascular packets are located outside the prostatic capsule, for localized disease nerve sparing should not affect margin status provided that the capsule is not violated. In this respect, identification of patients at high risk for extracapsular extension is essential, as it would allow for the selection of patients in whom a non-nerve sparing versus a unilateral or bilateral nerve sparing procedure should be performed.

Nerve sparing is performed via an interfascial dissection. This is performed between the prostatic fascia and levator fascia laterally and Denonvilliers fascia and prostate posteriorly.

Originally considered two bundles of tissue travelling along the posterolateral surface of the prostate, the course of the neurovascular bundles has been shown to be more diffuse. The prostatic fascia is incised anterolaterally and nerve sparing proceeds towards the apex using an athermal technique (Fig. 6.6). Different terms have been used to describe this technique including the "Veil of Aphrodite" and "high anterior release."

For right-sided nerve sparing, the fourth arm is used to gently rotate the prostate medially. The prostatic fascia is incised over the anterolateral

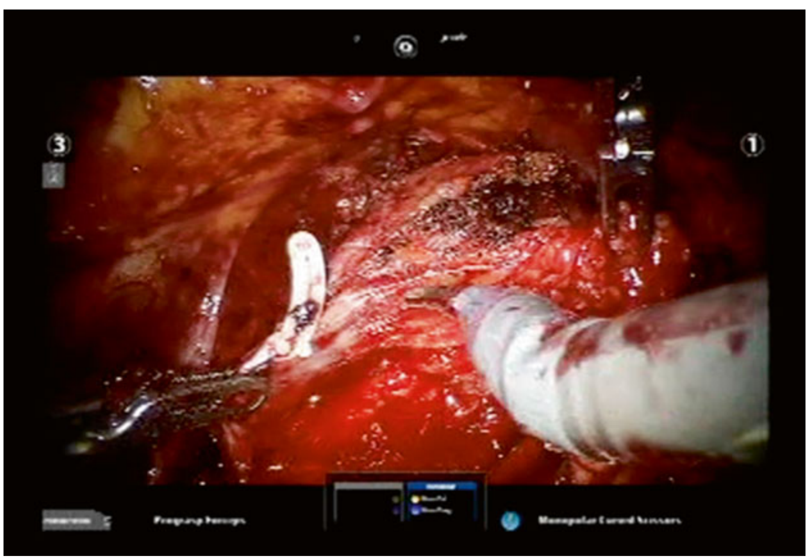

Fig. 6.6 Nerve sparing

surface. The incision is carried towards the apex in an antegrade fashion. The tissue is then released away from the prostate using sharp and blunt dissection.

Venous components are commonly the most medial component of the neurovascular bundle. This may be used as an anatomical landmark. They can be intentionally cut leaving the medial wall of the vein and the underlying inner prostatic fascia with the prostate.

To optimize potency outcomes, traction on the neurovascular bundles should be avoided. Care should also be taken to avoid incorporation of the neurovascular bundle in a suture or clip.

Compared to an Interfascial dissection, an Intrafascial dissection involves dissecting one layer closer between the prostatic fascia and capsule. This is best suited to those with low volume, low grade cancers where positive surgical margins are less likely to occur.

Apical Dissection/Transection of Urethra

At this stage of the procedure, the prostate should be free at the base, posteriorly and laterally. The only remaining attachments are the dorsal venous complex, urethra, and rectourethralis fibers.

The prostatic apex is the most common site of positive margins with radical prostatectomy. Anatomy in this area can be highly variable and care should be taken to ensure that no lip of prostate tissue is left behind.

In this regard, optimal visualization is crucial. It is important that bleeding from the dorsal venous complex be minimal. Increasing pneumoperitoneum to 20 mmHg prior to transection of the dorsal venous complex and judicious use of suction by the assistant can help to minimize bleeding.

The base of the prostate is grasped with the third robotic arm and pulled in a cephalad direction. The dorsal venous complex is then transected using scissors (Fig. 6.7). To avoid entry into the prostate, the angle of incision should be horizontal.

After division of the complex, the urethra is visualized. It is transected a few millimeters distal to the prostatic notch (Fig. 6.8). The urethral catheter is visualized and retracted and the remaining urethra divided. The final remaining apical attachments are transected, with care taken to avoid transection of the neurovascular complex that lie in close proximity.

Traction on the prostate, directed alternatively to the patient's right and left sides, assists in delineation of the apex (Fig. 6.9).

After division of the urethra, the remaining rectourethralis fibers are divided. It is at this step that the rectum is most at risk of injury. As stated previously maximal posterior dissection to the apex

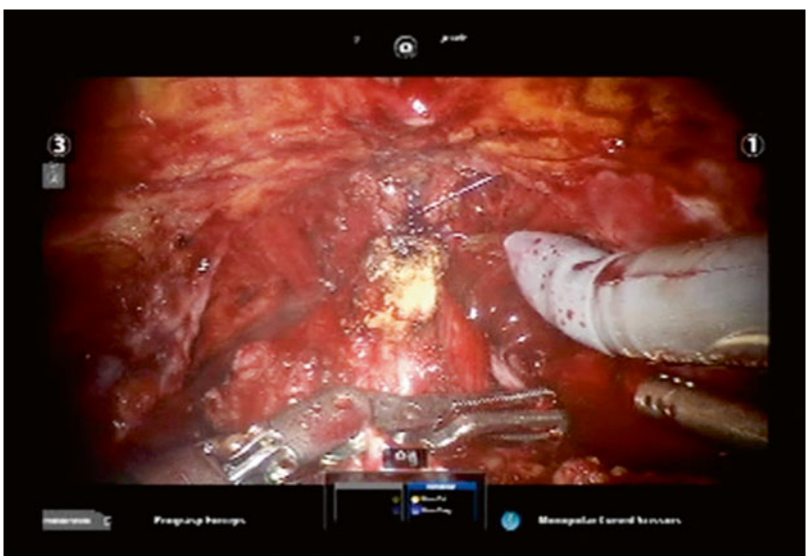

Fig. 6.7 Transection of the dorsal venous complex

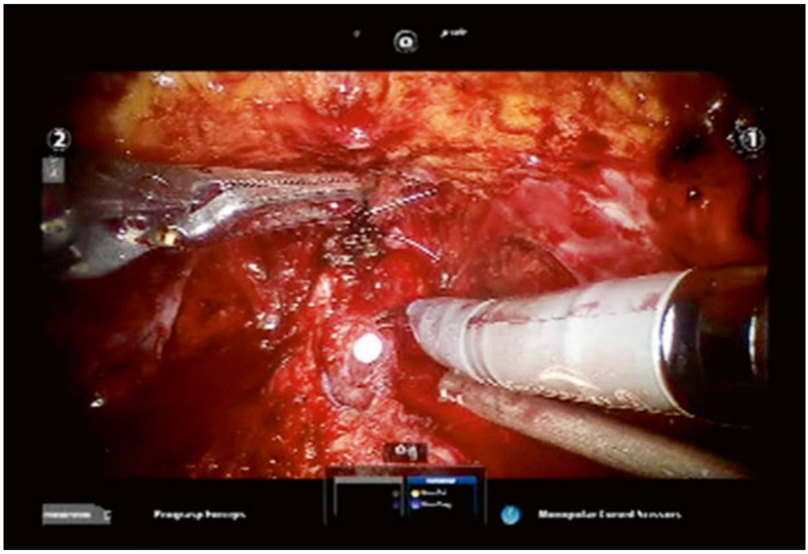

Fig. 6.8 Transection of urethra. The urethra is transected a few millimeters distal to the prostatic notch. Preservation of urethral length facilitates the vesicourethral anastomosis and improves postoperative continence

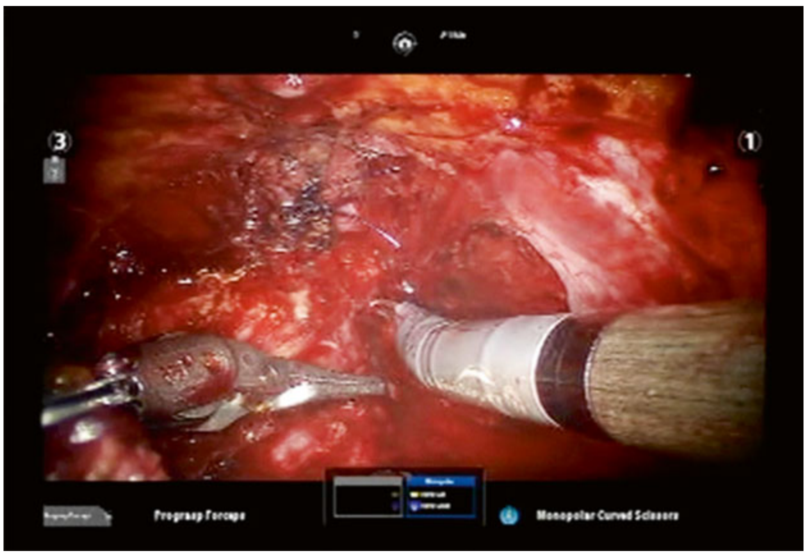

Fig. 6.9 Apical dissection. The prostate is rotated to visualize the remaining apical attachments

helps to decrease the chance of rectal injury. After transection of the rectourethralis fibers, the specimen is now completely free. It is inspected and if any area of concern is identified, additional sections can be sent off for frozen section analysis. The prostate is then placed in an extraction bag and stored in the abdomen for later extraction.

The neurovascular bundles appear as two tracts of tissue coursing along either side of the rectum towards the urethral stump (Fig. 6.10). The surgical site is copiously irrigated. Hemostasis is verified. Any areas of bleeding that are identified can be suture-ligated or clipped. However, care should be taken to avoid incorporating the neurovascular bundles.

Any free clips in the surgical site are removed, as they can migrate into the bladder and result in bladder calculi.

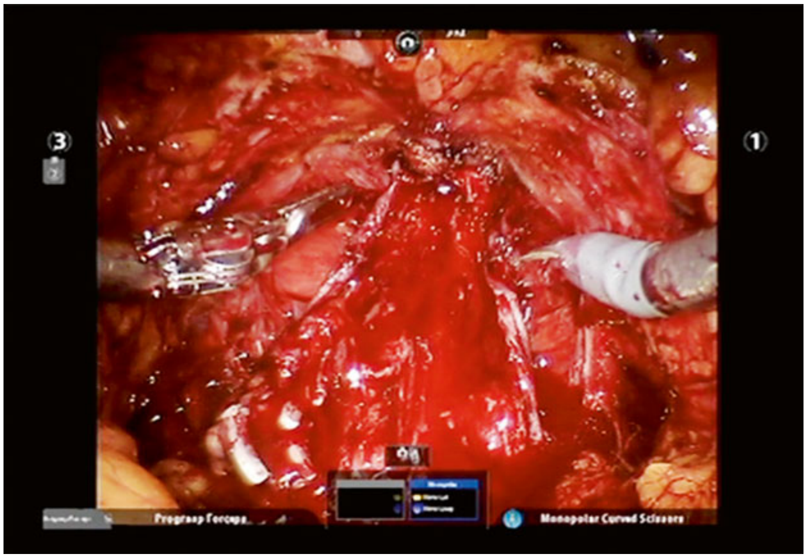

Fig. 6.10 Neurovascular bundles

Lymph Node Dissection

If required a lymph node dissection is now performed. The extent of lymph node dissection following prostatectomy has yet to be standardized.

Tissue around the obturator nerve and along the pelvic sidewall is dissected to clear the obturator fossa. The boundary of dissection includes the External Iliac Vein anteriorly, the Pelvic side wall laterally, the femoral canal inferiorly, and the bifurcation of the Common Iliac artery superiorly. Tissue to the lateral aspect of the bladder is also cleared. If an extended lymph node dissection is to be performed, the dissection is continued proximally up to the bifurcation of the aorta.

Dissection of the right lymph node packet is generally easier due to the angle of the robotic arms. The fourth robotic arm is used to retract the bladder medially. The lymph node packet above the external iliac vein is grasped and bluntly dissected (Fig. 6.11). The vein is skeletonized. Care must be taken as often an obturator vein can be encountered and can cause significant bleeding if avulsed. The lymph node packet is carefully dissected off this vein. During dissection, clips are used on lymphatic channels to minimize development of postoperative lymphoceles.

Care must be taken to avoid injury to the obturator nerve. Prior to clip application the obturator nerve must be identified. The nerve will lie lateral to the obturator vessels. Once identified, the nerve is exposed by blunt dissection by sweeping the packet in a direction parallel to the nerve.

Vascular injuries are controlled by robotic suture ligation. Ureteral injury may occur at the proximal limit of the dissection. If any injury occurs, a stented, spatulated end to end anastomosis should be performed.

Bladder Neck/Posterior Urethral Reconstruction

In cases where an enlarged bladder neck opening is present, reconstruction can quickly be accomplished by placing figure of eight absorbable sutures at the 4 and 8 o'clock positions. If the ureteral orifices lie close to the bladder neck, ureteral stents can be placed to avoid ureteral entrapment.

While not necessary, we routinely perform a posterior reconstruction as we feel this maneuver facilitates a tension-free urethral anastomosis. Posterior reconstruction is performed by approximating Denonvilliers fascia and the posterior detrusor muscle to the posterior rhabdosphincter.

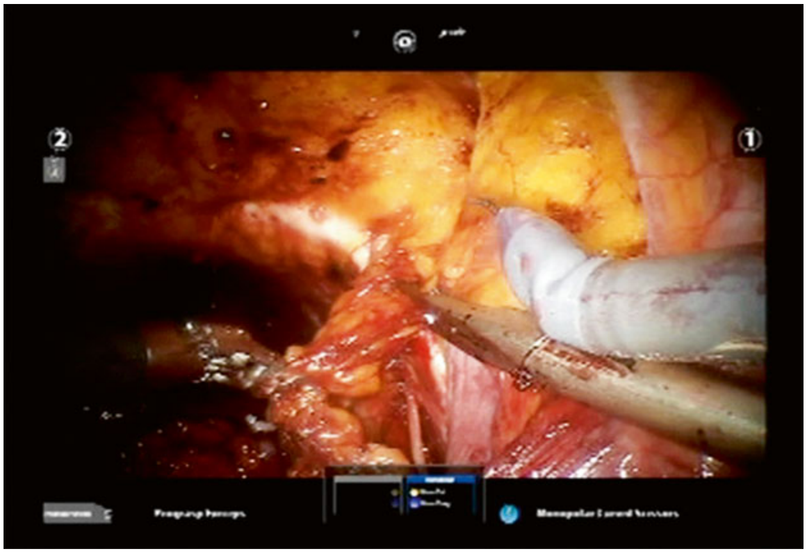

Fig. 6.11 Lymph node dissection: The lymph node packet has been dissected off the external iliac vein. The obturator nerve has been identified. The distal limit of the lymph node packet, the pubic bone, is clipped and divided

Vesico-Urethral Anastomosis

The anastomosis begins posteriorly in the midline and runs progressively anteriorly on either side. When placing sutures through the lateral portions of the urethra, care must be taken to avoid incorporation of the neurovascular bundles.

The anastomosis is performed using two eight inch 3-0 vicryl sutures that have been tied together. Alternatively, a barb suture may be used. The suture is thrown outside-in through the bladder neck and then inside-out through the urethra. After three throws have been thrown through the urethra, the surgeon pulls on the suture to cinch the bladder down to the urethra. If required, the assistant simultaneously pushes down on the bladder.

To aid with visualization of the urethral stump, switching back to a zero degree endoscope and perineal pressure applied by the assistant are effective. The assistant periodically moves the urethral catheter in/out to ensure that the urethra has not been backwalled and that the catheter itself has not been incorporated into the suture. Prior to tying down the anastomotic sutures a new 20-french urethral catheter is inserted under direct vision into the bladder. Otherwise, a percutaneous suprapubic catheter can be placed for bladder drainage.

A watertight anastomosis is confirmed by filling the bladder with 120 cm^3 normal saline. Any areas of leakage are closed with interrupted 3-0 vicryl sutures.

A closed suction drain is placed. The robot is undocked and all ports are removed under direct vision. The specimen is extracted through the camera port.

The suction drain is removed if drainage is less than 80 cm^3/24 h or if fluid creatinine is consistent with serum levels. The catheter is left indwelling for 7–10 days. Postoperatively a cystogram in performed prior to catheter removal.

Improving Continence

Multiple technical modifications have been developed to help patients to maintain or regain continence. These modifications can generally be divided into two categories: those that limit dissection of structures supporting the urethra and posterior pelvic floor and those that reconstruct these areas after the prostate has been removed. Techniques described include bladder neck preservation, bladder neck reconstruction, preservation of urethral length, periurethral suspension, posterior reconstruction, combined anterior and posterior reconstruction, endopelvic fascia preservation, complete anterior preservation, selective suturing of the dorsal venous complex, and nerve sparing.

Preservation of natural continence mechanisms is key for patients to regain postoperative urinary control, whereas reconstructive techniques may hasten urinary recovery.

Several Described Modifications Include

Bladder Neck Preservation

The bladder neck serves as an Internal Sphincter and is composed of three distinct muscle layers including an inner longitudinal layer, a middle circular layer, and an outer longitudinal layer.

Outcomes of bladder neck preservation in open and laparoscopic series provided conflicting results with some studies showing small benefit with continence and potentially increased positive margins. However, more recent series of robotic prostatectomy have shown improved continence with no effect on positive margin rates.

Periurethral (Anterior) Suspension

After ligation of the Dorsal Venous complex, a second suture is placed through the dorsal venous complex. The suture is then passed from left to right through the pubic periosteum. The suture is then passed from right to left through the dorsal venous complex and again through the pubic periosteum and tied. This has been shown to hasten recovery of urinary incontinence at 3 months although continence at 12 months remained similar. Another advantage of this suspension is that it may decrease the chance of inadvertent transection of this suture during division of the dorsal venous complex.

Posterior Reconstruction

This reconstructs the posterior musculofascial plate. Starting on the right side, a suture is passed through the cut end of Denonvillier's fascia and posterior detrusor fibers and then through the rectourethralis fibers. This is repeated two to three times and then tied. As stated earlier, we perform this maneuver as we find it aids with a tension-free urethral anastomosis. In addition in a meta-analysis there was lower risk of postoperative urine leak. However, evidence regarding its effectiveness on urinary continence has been conflicting. Some studies have shown improvement in early return of continence with no difference in long-term continence whereas others show no benefit.

Results of studies of both combined anterior and posterior reconstruction have also been conflicting.

Selective Dorsal Venous Complex Ligation

The open venous channels are selectively ligated rather than the complex as a whole thus avoiding potential damage to surrounding levator fibers. This may lead to earlier return of continence, although long-term continence is unchanged.

Nerve Sparing

Although the rhabdosphincter receives innervation from the pudendal nerve, authors have noted an improvement in urinary continence with a nerve-sparing procedure.

Positive Margins

Most positive margins occur at the apex of the prostate. To minimize chance of apical positive margins tips include complete dissection of the fatty tissue around the puboprostatic ligaments and the dorsal venous complex, incision of the endopelvic fascia, dissection of the levator fibers from the DVC in order to increase the length of the venous plexus, and transection of the urethra 3–6 mm distal to the prostatourethral junction.

Preserving Potency

As stated earlier, the principles of nerve sparing revolve around minimal traction, athermal dissection, and dissecting within the correct tissue planes.

Nerve sparing can be performed in an antegrade fashion (base to apex) or in a retrograde fashion (apex to base).

Several techniques of nerve sparing are available including "the Veil of Aphrodite," "athermal retrograde neurovascular release," and "clipless antegrade nerve sparing."

The Veil of Aphrodite/High Anterior Release

The plane between the posterior prostatic fascia and Denonvilliers fascia is extended distally towards the apex and laterally to reveal the prostatic pedicles. The pedicles are controlled with clips. The prostatic fascia is then incised anteriorly to enter the intrafascial plane. The entire periprostatic fascia is released hanging from the pubourethral ligaments. In the Superveil modification, the dorsal venous complex and puboprostatic ligaments are also preserved.

Athermal Early Retrograde Release of the Neurovascular Bundle

The lateral pelvic fascia is incised at the apex and midportion of the prostate and a plane is developed between the neurovascular bundle and prostatic fascia. The dissection is continued posteriorly until it meets the plane initially developed between the prostate and rectum. The pedicle is then ligated above the neurovascular bundle.

Antegrade Nerve Sparing

The interfascial plane between the rectum and prostate is developed to the apex of the prostate. The pedicles are then thinned using blunt and sharp dissection proceeding in a medial to lateral direction. The dissection then proceeds anteriorly towards the apex of the prostate.

Summary

Since its introduction in 1999, the da Vinci Surgical System, with its improved ergonomics, wristed instrumentation, and magnified, three-dimensional visualization, has become an integral tool in urologic surgery.

This chapter highlights the technique of robotic prostatectomy and describes techniques to maximize the Trifecta outcomes of cancer control, urinary continence, and erectile function.

With increasing experience, refinements in technique have resulted in improved outcomes for patients. Future areas of research should focus on developing patient-specific surgical protocols based on risk stratification that further enhance quality of life and cure for our patients.

Suggested Reading

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