**SURGICAL ANATOMY OF RADICAL PROSTATECTOMY: PERIPROSTATIC FASCIAL ANATOMY AND OVERVIEW OF THE URINARY SPHINCTERS**

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**Summary.-** Advances in the understanding of prostate and pelvic anatomy in recent years made a substantial contribution to improve the surgical technique for the treatment of prostate cancer (PC) with the potential preservation of anatomic structures responsible for erectile and urinary function postoperatively. Knowledge of these anatomic structures is key to achieve a complete removal of the prostate and seminal vesicles while preserving the best possible quality of life. The literature on prostate and pelvic anatomy has been reviewed and an updated notion of the surgical anatomy is herein provided.

**Keywords:** Prostate cancer · Anatomy · Radical prostatectomy

**INTRODUCTION**

“In general surgeons who know the anatomy protect the patient by virtue of less blood loss, better margins of resection and greater functional preservation” (Robert P. Myers) (1).

Radical prostatectomy (RP) is the only primary treatment modality of localized prostate cancer (PC) that has proved its effectiveness against watchful waiting in a clinical randomized trial (2). Advances in the understanding of prostate and pelvic anatomy in recent years have contributed to improvements in surgical technique that translated into outstanding long term survival results with reasonably good, though far from optimal, functional outcomes in experienced hands, no matter what surgical technique was chosen, that is, open, (3-7) laparoscopic (8-10) or robotic (11-14) RP.
RESULTS & DISCUSSION

Type and extent of cavernous nerves and neurovascular “bundle” dissection (NVB)

Although the anatomical description of the nerves responsible for erectile function dates back to the 19th century (19), Walsh and colleagues (20) were the first to introduce the term “bundle” as the macroscopic landmark to be used intraoperatively to identify and preserve the cavernous nerves (CN). However, since then, the terms NVB and cavernous nerves have been often used interchangeably. More recently, Costello et al emphasized that interchangeable use of those terms was no longer appropriate because the “bundles” contained not only the cavernous nerves but also part of the neurovascular supply to the rectum, levator ani muscle, urethra, prostate and seminal vesicles (16).

The NVB are composed of both sympathetic and parasympathetic fibers coming from the pelvic plexus (inferior hypogastric plexus). While the former fibers are mostly responsible for ejaculation and urinary continence, the latter mostly contribute to erectile function (21). The pelvic plexus is situated bilaterally within the fibro-fatty tissue of the lateral aspect of the rectum at its junction with the urinary bladder, spreading in a fan-like distribution with up to 3 cm separating the anterior and posterior most nerves. Its length is approximately 4 cm. It extends from the sacrum ventrally as high as the rectovesical cul-de-sac (21-23). The fibers located on the most anterior aspect of the pelvic plexus are only millimeters away from the lateral surfaces of the seminal vesicles, the bladder neck and the prostate base (24, 25).

Although potential injury to the CN might be possible in this area, the parasympathetic fibers, ultimately responsible of erectile function, join the neurovascular bundle 2 to 3 cm below the junction of the bladder neck and prostate in a spray-like fashion (26, 27). The nerves converge at the mid-level of the prostate only to diverge once again when approaching the prostate apex (16, 28, 29).

Herein we will primarily focus on the understanding of the periprostatic fascial anatomy and the different extents of neurovascular bundle dissection in relation to the location and distribution of the cavernous nerves. Then, we provide an overview of the configuration of the urinary sphincter and its supporting structures.

METHODS

A literature search in English was performed using the National Library of Medicine database and the following key words: radical prostatectomy, anatomy, neurovascular bundle, cavernous nerves, fascia, Denonvilliers’ fascia, pelvis anatomy, rectourethralis muscle, puboperinealis, levator ani and urinary sphincter. A free-text strategy was applied without limiting the year of publication. Anatomy text books were also consulted.

Reference lists of retrieved articles were scrutinized for additional relevant articles. One hundred and three citations were selected for this review based on their relevance, study size, study design and overall contribution to the field.
a means of obtaining better erectile function results postoperatively (30). The tips themselves are actually contained in fascial pockets; the NVB is adherent to the lateral surface of the SV just distal to the tips.

Studies have shown a high interindividual variation of the nerve fiber count and distribution surrounding the prostate (31-33). The bulk of the neurovascular structures tend to be located posterolaterally in the majority of patients, but may not always form a bundle. A significant proportion of fibers may lie away from the main nerve trunks, along the lateral and posterior aspects of the prostate (34, 35). Controversy in the literature persists regarding the role of NVB preservation in recovery of urinary continence (36-40) (see below)

Having described the location of the CN in relation to the NVB and periprostatic area, understanding the location and distribution of the fascias around the prostate and their relation to the NVB becomes key to achieve the desired degree of CN dissection. The following fascias are surgical landmarks that will help determine the layers that should be incised in order to remove or preserve different amounts of cavernous nerve tissue during RP (41-44). There are 4 main distinct fascias surrounding the prostate and the NVB: (17) (Figure 1)

a. Endopelvic fascia, (levator ani fascia lateral to the fascial tendinous arch).

b. Levator ani fascia (lateral pelvic fascia, as a remnant of levator ani fascia on the lateral prostate surface after incising the endopelvic fascia lateral to the fascial tendinous arch of the pelvis)

c. Prostatic fascia

d. Denonvilliers’ fascia (prostato-seminal vesicular fascia).

a- Endopelvic fascia:

The endopelvic fascia has two components: parietal and visceral. The parietal layer (endopelvic fascia) covers the levator ani lateral to the fascial tendinous arch of the pelvis (45). Visceral fascia is any fascia that covers a viscus, namely the fascia medial to the fascial tendinous arch. This fascia covers longitudinal smooth muscle of the bladder that forms a discrete layer covering the entire anterior surface of the underlying prostate.

According to Villers and colleagues (45), the visceral pelvic fascia is composed of the connective fatty tissue and neurovascular supply located underneath the parietal fasciae. It covers and is adherent to all surfaces of bladder, prostate, seminal vesicles, rectum, and pudendal vasculature. Its thickness varies according to the amount of adipose tissue, vessels and nerves it contains. The fascial tendinous arch represents a thickening of parietal and visceral components of the endopelvic fascia that extends from the pubovesical (puboprostatic) ligaments to the ischial spine bilaterally (45) (see below)

However, Myers and colleagues proposed a simpler definition of endopelvic fascia, a definition that conforms to the Terminologia Anatomica, 1998 and the preceding Nomina Anatomicas. The fascia lateral to the fascial tendinous arch is called the parietal endopelvic fascia, and the fascia medial to it, as it sweeps over the anterior bladder and underlying prostate, forms the visceral pelvic fascia (1).

Takenaka and colleagues (17) elegantly confirmed in cadaveric studies what pioneering open and laparoscopic prostatectomy surgeons traditionally preached regarding the correct location to incise the fascia medial to the fascial tendinous arch in order to access the lateral aspects of the prostate without leaving the levator ani fibers bare (3, 42) As depicted in Figure 1 (shaded area), on some occasions, part

![Diagram of fascial anatomy of the prostate in mid prostate axial section. Note the shaded areas often coalesce and needs to be dissected apart to access the cul-de-sac where the endopelvic fascia reflects. The deepest part of the endopelvic fascia is the location where it should be incised in order to minimize the risk of leaving levator ani muscles fibers bare. f. fascia. m. muscle.](image-url)
of the endopelvic fascia embracing the prostate coalesces with that lying over the levator ani fascia at its deepest point of reflection. This fusion of layers needs to be detached for an adequate incision of the endopelvic fascia. Applying countertraction on the prostate facilitates identification and dissection of the contour of fascial reflection where the endopelvic fascia forms a cul-de-sac between the levator ani fascia laterally and the prostatic fascia medially (17). It is easier to identify and correctly incise this cul-desac when this dissection is initiated close to the base of the prostate (as opposed to close to the apex) where the endopelvic fascia seems to be thinner and the space between levator ani and the prostatic fascia is wider. Having said that, not all prostates have prostatic fascia, some just have a pseudocapsule, and this kind of entry medial to the fascial tendinous arch risks capsulotomy. (Myers, in press)

**Levator ani fascia (LAF)**

As an outer periprostatic fascia, LAF (lateral pelvic fascia) covers the underlying, laterally distributed levator ani muscle and therefore forms the lateral boundary of the axial triangular space occupied by the bulk of the cavernous nerves and vessels, and varying amounts of fat. The medial and posterior boundaries of such triangle are formed by the pseudocapsule of the prostate (covered or not by the prostatic fascia) and Denonvilliers’ fascia, respectively (16, 17, 46-48). The LAF extends posteriorly over the muscle fibers and continues over the lateral aspect of the rectum to form the so-called pararectal fascia (16, 49, 50) which fuses posteriorly with the presacral fascia (47) (Figure 1). As previously mentioned, the LAF is variably adherent to but not completely fused to the PF, thus, they can be dissected apart generating a space in between them, where the endopelvic fascia reflects forming a cul-de-sac. Opening the endopelvic fascia medial to this cul-de-sac and the fascial tendinous arch of the pelvis will leave the levator ani fibers covered by its own fascia. Occasionally the LAF may be adherent to the prostatic-urethral junction (27).

**Prostatic fascia (PF)**

Beneath the outer, thin LAF fascia, the prostate is variably covered by a second, inner periprostatic fascia, the prostatic fascia (PF). The PF is fused with the anterior fibromuscular stroma anteriorly (48), coming into intimate contact with the prostate pseudocapsule more laterally. Sometimes, PF is absent (Myers, in press)

**Denonvilliers’ fascia (DF)**

Denonvilliers’ fascia (prostato-semi-vesicular fascia) (44, 51) is macroscopically composed of a single, whitish layer of tissue that extends caudally over the posterior aspect of the seminal vesicles (SVs) and prostate to merge in the midline with the perineal body; (44) (Figure 2) Although macroscopically single-layered, DF is histologically composed in the majority of cases, though not always, of 2 layers that can be distinguished under microscope. Some authors describe it as multilayered, particularly at its most distal portion (44, 48, 52). DF often is in intimate contact with the posterior aspect of the prostate in the midline (48-52). More laterally, DF continues its course around the rectum detaching itself from the posterior aspect of the prostate pseudocapsule, to form the posterior limit of the aforementioned triangle (Figure 1). Depending on individual variations, a few fibers of DF may still be in link in part to the prostate pseudocapsule in this lateral area (48). DF continues around the mesorectum, where it may become thin and interrupted (47).

The origin of DF is controversial. While some authors support the theory of fusion of the anterior and posterior sheaths of the embryological cul-de-sac, other simply propose that DF originates from condensation of loose areolar tissue (53).

The description of the axially oriented, triangular space containing the bulk of the NVB seems somewhat simplistic and tries to be more didactic and reproducible than anatomically realistic. Evidence of this is the controversy in the literature regarding the relationship between the LAF, DF and components of the NVB.

For example, Villers and Myers described the DF to divide at the posterolateral border of the prostate into an anterio-rior and posterior leaf around the NVB. While the anterior leaf becomes PF, the posterior continues its course on the rectum to limit the triangle posteriorly (47). Based on this description, they describe three types of NVB dissection: (44, 45)

**a. Intrafascial plane:** The pseudocapsule of the prostate is rendered bare of any tissue. The aforementioned anterior leaf of DF (PF) is left covering the medial aspect of the NVB.

**b. Interfascial plane:** In this case, PF remains on the posterolateral surface of the prostate. The anterior leaf of DF or PF stays on the prostate side and the medial aspect of the NVB becomes bare of any fascia. Here, the likelihood of NVB damage might increase, but gives the surgeon a safer oncologic margin, especially at the posterolateral aspect of the prostate.

**c. Extrafascial plane:** The dissection is carried out posterior to the NVB and out laterally to the LAF. The
prostate is then removed with all layers of visceral fibrofatty sheath present on the specimen (wide resection). The NVBs are excised completely or almost completely.

Kour-ambas and colleagues (49) differ from this version in that DF divides laterally into several laminae and DF in not clearly defined at its lateral edges. They show some compartmentalization of the NVB by fascial strands in axial section. They described that the DF represented the horizontal bar of an H-shaped fascial structure, leaving the prostate anterior and the rectum posterior. The anterior extension of the H was represented by the left and right LAF and the lower parts by the para-rectal fascia (continuation of LAF). Notwithstanding, there is PF anterior to NVB and a layer of DF posterior to the NVB, meaning that their basic scheme is not different from the one described Villers and Myers. Villers and Myers have simply tried to simplify without worrying about fascial stranding within the NVB.

According to Costello and colleagues (16), the boundaries of the triangular area are not as clear as previously mentioned. At the junction of the PF, DF and pararectal fasciae, there are numerous leaves of fibrous tissue. The posterior and lateral aspects of the NVB run through these leaves. (compartmentalization) Denonvilliers’ and pararectal fasciae are separated from the anterior and lateral surfaces of the rectum by variable amounts of perirectal adipose tissue (16).

Most authors seem to agree that there are anatomical variations regarding the number and thickness of collagen layers composing the PF and DF at the posterolateral aspect of the prostate. Similarly, exact location of NVB can vary, with larger prostate glands tending to displace the bulk of the NVB more posteriorly (24, 25). Needless to say, recovery of erectile function postoperatively will not solely depend on “anatomical” cavernous nerve preservation, but also on their functional status (avoidance of traction, etc.), as well as on other anatomic factors, like preservation of accessory pudendal arteries (54-58), age, preoperative erectile function (59) and social aspects.

The sometimes quoted posterior layer of the DF in the colorectal literature is in reality the fascia propria of the rectum (serosa) (60). The mesorectum represents the fatty layer located between the fascia propria of the rectum and DF, and this is the plane of dissection that should be followed during RP in order to minimize the risk of having a positive surgical margin at the posterior aspect of the prostate (45, 61, 62). This plane is also commonly followed by colorectal surgeons during rectocolonic resections (47, 60, 63).

Similarly, the often cited anterior layer of DF interposed between the posterior bladder neck and the anterior aspect of the SV and vasa deferentia corresponds in fact to Gil Vernet’s posterior longitudinal fibers of the detrusor running in between and behind the ureteral orifices (called vesicoprostatic muscle by Dorschner and colleagues, m. vesicoprostaticus,TA) (64-68). This posterior longitudinal fascia of the prostate is covered by the bladder adventitia on the outside (65, 68, 69). Vesical remnants of these posterior longitudinal fibers of the detrusor are what Rocco and colleagues seem to use to fixate DF during their posterior reconstruction of the rhabdosphincter right before performing the urethrovesical anastomosis (70, 71). There is controversy in the literature regarding the justification and effectiveness of this technique (72, 73) (see below)

Prostate Pseudocapsule:

As often taught to us by pathologists, the prostate has no real capsule. The outermost part of the prostate is often composed of variable layers of condensed fibro muscular fascicles inseparable from the prostatic stroma. This pseudocapsule (46) is almost absent at the anterior aspect of the prostate, where the anterior fibromuscular stroma is identified. (Figure 1) In addition, the pseudocapsule is absent at the apex of the gland and at the prostate base, where the gland fuses with the urinary sphincter and the bladder neck, respectively (48). With respect to the lateral surfaces of the prostate, there are prostes with capsule but no PF, and prostes with PF and no capsule with a range of intermediate forms. (Myers, in press.)

It would be difficult to recommend defined areas in which a surgeon should predominantly focus on nerve preservation. Based on the aforementioned anatomic landmarks, some surgeons have proposed a high release of the fascia on the lateral surface of the prostate in highly selected patients resulting in improved erectile function recovery postoperatively (24, 74-78). The objective is to preserve as many nerve fibers as possible (25, 26, 79). Postoperative potency might improve with the increasing number of preserved nerve fibers; nonetheless, this is a surgical option that can compromise the cancer operation as it may cause a positive surgical margin (74).

Special care should be applied to the apical region, where injuries to the NVB are not infrequent. In this area, the NVB is located only millimeters away from the posterolateral aspect of the membranous urethra and prostate apex bilaterally (25) (Figure 3).
That is the reason why early release of the NVB can help minimize risk of traction injury (74-76).

**Urinary sphincter**

The external (as opposed to the bladder neck internal sphincter) urinary sphincter is another structure, which might be damaged during RP with potential deleterious consequences to postoperative recovery of urinary continence and quality of life. Therefore, detailed knowledge of its anatomy and function becomes essential to obtain acceptable postoperative continence results.

Koraitim recently made a thorough review of the anatomy and physiology of the male urethral sphincter (80). The urethral sphincter is composed of 2 morphologically related but, possibly, functionally unrelated components that extend in the form of a cylinder around the urethra from the bladder neck to the distal end of the membranous urethra: (1, 32, 64, 81-84) (Table and Figures 2 & 3)

1- **Intrinsic smooth muscle sphincter or lissosphincter:**

   It is composed of an inner layer of smooth involuntary muscle that has its main part at the bladder neck and is thinner in its further course in the urethra. It forms a complete cylinder of circular muscle fibers around the urethra, and lies between the urethral mucosa and the striated external urethral muscle, making up with the connective and elastic tissue the bulk of the urethral wall (Figure 3). It consists of a distinct layer of longitudinal smooth muscle surrounded by a wider layer of circular smooth muscle. The lissosphincter maintains continence at rest by contraction of its circular muscle fibers, resulting in closure of the vesical orifice and concentric narrowing of the posterior urethra. Maximum closure may be assumed to be at the level of the vesical orifice, where the lissosphincter is thickest (85), and in the membranous urethra, where the urethra is most narrow. Contraction of the longitudinal fibers widens the urethra during the evacuation of urine. Complete preservation is not necessary for continence, as passive continence may be accomplished by preserving a minimal length of smooth muscle sphincter postoperatively. This could be the rationale for better continence results after RP described in patients with longer membranous urethra (86).

2- **External striated urethral sphincter or rhabdosphincter:**

   It is composed of the outer layer of probably involuntary, predominantly slow-twitch, fine-fibered striated muscle (as opposed to coarse-fibered, fast-twitch, voluntary skeletal muscle), which is most marked and thickest around the membranous urethra, and becomes gradually less distinct toward the bladder (Figures 2 & 3). From the perineal body to the prostatic apex the striated muscle fibers unite behind the urethra in a central fibrous raphe (81), while more proximal they form a cap on the anterolateral side of the prostate. (Figure 3) While anatomically indivisible, the rhabdosphincter consists of two functionally distinct components:

   a- Ventral fibers extending cephalad over the prostatic urethra.

   b- Caudal fibers extending over the membranous urethra.

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**FIGURE 2.** Relation of the pelvic structures in a prostate sagittal section. f. fascia. m. muscle.

**FIGURE 3.** Axial section of the sphincteric urethra. f. fascia. m. muscle.
α- This muscle has to relax to allow semen to enter the bulbous portion of the urethra so that the bulbospongiosus muscle (once called the ejaculator urethrae) can ejaculate the semen.

β- While controversial, the more caudal muscle fibers of the rhabdosphincter, composed of mixed slow and maybe fast twitch striated fibers (87, 88), may be responsible for active urinary continence as they contract against a fixed posterior median raphe, resulting in collapse of the anterior urethral wall against the posterior wall. In addition, it is speculated that both Denonvilliers’ fascia and the rectourethralis muscle might form a rigid posterior plate against which compression of the anterior urethral wall might increase the surface area of coaptation; thus, creating a higher urethral resistance (89). This could explain, in part, the improvements in shortening time to continence found in patients undergoing the so-called “Rocco stitch” (70-72, 90). Nonetheless, other authors did not find this technical modification useful, although it can be argued that they possibly did not reproduce exactly the posterior urethral plate reconstruction described originally (73).

Rocco and colleagues believe, “Denonvilliers’ fascia, and the dorsal aspect of the prostate, acts as a suspensory system for the prostatomembranous urethra and that its division during radical prostatectomy results in the loss of the posterior cranial insertion of the sphincter, the caudal displacement of the sphincteric complex, and a prolapse of the perineum” during this posterior reconstruction (71).

From the embryological point of view, DF is a remnant barrier between the urinary tract and the terminal portion of the digestive system (50, 91). The so called “prolapse of the perineum” may be more of a visual artifact and a function of increased intraperitoneal pressure than a real function of DF sectioning. Pulling on the prostate while sectioning the urethra and distal attachments of DF, makes the surgeon believe that the extraprostatic section of the membranous urethra is longer (or more intrapelvic) than it actually is (92). Actually, it can be hypothesized that excessive pulling from the prostate can tear some sphincteric muscle fibers impacting negatively an adequate postoperative function. It can be clearly observed during laparoscopic or robotic RP that the urethra retracts on its own after being sectioned despite the distal attachment of DF remaining uncut. Sectioning this last attachment has no impact on urethral retraction or on its elastic length.

The urethra is supported anteriorly and laterally, but there is no anatomic evidence that it is supported cranially by any structure other than, possibly, the prostate (1). Burnett and Mostwin (81) described the male urethral sphincter complex as consisting of the prostatomembranous urethra, periurethral musculature (rhabdosphincter), extrinsic pararectal musculature and connective tissue structures of the pelvis. There is a ligamentous framework supporting the rhabdosphincter mostly composed of the pubourethral ligaments anteriorly (most distal part of the pubovesical ligament or vesical apron), the ischioprostatic ligaments (Mueller’s

**TABLE I. COMPARISON BETWEEN LISSOSPINCITER AND RHABDOSPINCITER CHARACTERISTICS OF THE MALE URETHRA.**

<table>
<thead>
<tr>
<th></th>
<th>Lissosphincter</th>
<th>Rhabdosphincter</th>
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<tbody>
<tr>
<td><strong>Control</strong></td>
<td>Involuntary</td>
<td>Voluntary? (Controversial)</td>
</tr>
<tr>
<td><strong>Location</strong></td>
<td>Inner</td>
<td>Outer</td>
</tr>
<tr>
<td><strong>Distribution</strong></td>
<td>Thicker at the bladder orifice</td>
<td>Thicker at the membranous urethra</td>
</tr>
<tr>
<td><strong>Components</strong></td>
<td>Smooth muscle, inner longitudinal layer covered by an outer circular layer</td>
<td>Striated muscle, single unit composed of urethral and prostatic fibers</td>
</tr>
<tr>
<td><strong>Function</strong></td>
<td>Passive continence</td>
<td>Active continence ? (Controversial)</td>
</tr>
<tr>
<td><strong>Modifications with age</strong></td>
<td>Does not change</td>
<td>Atrophy of prostatic and membranous urethral components</td>
</tr>
<tr>
<td><strong>Changes with BPH</strong></td>
<td>None</td>
<td>Yes</td>
</tr>
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</table>
ligaments) (1) and the medial fascia of the levator ani, laterally. The dorsal fixation of the membranous urethra is subject of controversy. We believe the midline fibrous raphe inserts into the perineal body (81), and not into the rectourethralis muscle as described by others. Porzionato and colleagues (93) corroborated prior observations (94) that muscle fibers along the anterior aspect of the rectourethralis muscle did not reach the posterior wall of the membranous urethra. The mean distance between the rectourethralis muscle and the membranous urethra was 5.3 mm in adults, and 1.0 mm in infants (27, 95, 96). Therefore, DF seems unlikely to exert cephalic support of the urethra. In the same way, Soga and colleagues (27) warn against the risks of nerve injury during posterior reconstruction of the retourethral plate described by Rocco (70, 71).

The urethral sphincter is innervated by branches of the pudendal nerve and by autonomic branches of the pelvic plexus, which partly run with the NVB (25, 97-100). Takenaka recently estimated a 3–13 mm distance from the prostatic apex to the point where the nearest pudendal neural branch enters the sphincter (17, 84). Con-servation of these branches may improve postoperative urinary continence, (82), thus, it seems important to limit the distal dissection of the membranous urethra. Nerve fibers of the NVB enter the urethra at the 3 and 9 o’clock position (101). There is controversy in the literature in relation to the role of NVB preservation in recovery of urinary continence. (36, 39, 102). Although it is unclear whether preservation of the neurovascular bundles themselves or the meticulous dissection required to dissect the nerves from the apex of the prostate is responsible for the improvement in continence after ‘nerve-sparing’ surgery, every effort should be made to preserve those nerve fibers as long as oncologic safety is not compromised. Careful control of the DVC is key to obtaining a bloodless field and achieving adequate visualization of the prostato-urethral junction and the posterolateral NVB structures. Injuries to the NVB might be caused by direct trauma, NVB traction or by accidentally including the NVB in sutures during the ligation of the DVC or during the urethral anastomosis (4, 103).

CONCLUSION

Anatomy of the prostate is complex and can show individual variations, which adds to the technical difficulties of radical prostatectomy. Understanding of the periprostatic fascial anatomy is key to achieving optimal resection of the prostate gland and seminal vesicles with negative surgical margins in order to maximize the chances of cancer control. Pre-cise preservation of the urethral sphincter and its autonomic innervation will result in good postoperative urinary continence results. Early recovery of erectile function postoperatively will depend both on the anatomical and functional preservation of the neurovascular structures and accessory pudendal arteries surrounding the prostate in properly selected patients. Intraoperative recognition of the periprostatic vasculature will help decrease blood loss and reduce the chances of having perioperative complications.

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