

Preperitoneal mesh-plug herniorrhaphy during radical retropubic prostatectomy

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Background: The treatment of localized prostate cancer has increased over the past decade in large part due to enhanced screening efforts with prostate specific antigen (PSA) and has resulted in a dramatic increase in the number of radical retropubic prostatectomies being performed in recent years. It is estimated that between 5% and 10% of men who are candidates for radical surgical treatment for localized prostate cancer will have concomitant inguinal hernia. Given the well described complications of untreated inguinal hernias we propose that simultaneous repair be undertaken along with radical retropubic prostatectomy for preoperatively defined hernias

and those incidentally discovered at the time of surgery.

Material and methods: We concomitantly performed a novel inguinal hernia repair using a Marlex mesh plug in 15 patients who presented to our center for radical prostatectomy.

Results: There were no intra or post operative complications related to the repair. At a median follow up time of 18 months there were no developed recurrences or post operative orchalgia.

Conclusion: Preperitoneal mesh-plug herniorrhaphy is a safe and effective technique used to repair inguinal hernias that present concomitantly with prostate cancer in patients undergoing radical retropubic prostatectomy.

Key Words: radical retropubic prostatectomy, preperitoneal inguinal herniorrhaphy, prostate cancer, hernia, mesh plug

Introduction

Prostate cancer has received considerable attention of late in both the medical literature and lay press, in

part because it is the number one cancer in North American adult males and the number two cause of cancer death, and because of recent advances in screening for localized and therefore treatable disease. Prostate cancer (CaP) will be diagnosed in 17 800 Canadian men this year causing an estimated 4300 deaths.¹ The incidence of CAP is continuing to rise even when correcting for the overall aging of the population.²⁻⁵ The number of radical prostatectomies performed over the past decade in the US has increased dramatically.⁶ Approximately 5%-10% of

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patients evaluated preoperatively for RRP have detectable inguinal hernias.⁷ We can appreciate that the same population of men who are at risk for CaP and who are candidates for RRP are also historically, the same group who present with inguinal hernias. Therefore, it is not surprising to encounter concomitant inguinal pathology at the time of prostate surgery.

It is well described that untreated inguinal hernias may have potentially serious sequela such as bowel ischemia, obstruction, and even strangulation all of which have significant morbidity and mortality. Therefore a detailed preoperative evaluation including a history looking for any predisposing factors such as chronic obstructive pulmonary disease, obstructive urinary symptoms, etc., and physical examination focusing on scrotal and inguinal regions as well as operative repair of inguinal hernias in patients undergoing RRP should be considered.

Riba and Mehn first described synchronous repair of inguinal hernia during open prostatectomy in 1951.⁸ Many others have published reports on similar hernia repair during pelvic operation for benign prostatic hyperplasia.⁹⁻¹¹ The potential utility of synchronous hernia repair during RRP for CaP using the preperitoneal approach was first proposed by Schlegel and Walsh, using a modified Nyhus nonmesh technique.¹² This technique involved dissection of the hernia sac and identification of the hernia defect as direct or indirect. Indirect hernias were then repaired by reapproximating the transversus arch to the iliopubic tract lateral to the cord structures using interrupted 2-0 polypropylene sutures. With direct hernias the defect was closed medial to the cord with the most medial portion of the suture incorporating Cooper's ligament as well, which is inferior to the iliopubic tract. Despite initial enthusiasm for the preperitoneal herniorraphy, the technical complexity and unfamiliarity with the preperitoneal anatomy have undoubtedly hampered its wide spread adoption. However, recent interest has been stimulated since the innovative Stoppa herniorraphy has gained prominence.¹³ This procedure, also known as "giant prosthetic reinforcement of the visceral sac" involves placing a large nonabsorbable prosthesis in the preperitoneal space which replaces a weakened transversalis fascia. The prosthesis, held in position by intrabdominal pressure, renders the peritoneum nonextensible and thus, eliminates any potential protrusion of abdominal contents and repairs the hernia. Most common indications for the Stoppa procedure include recurrent and bilateral inguinal hernias.

Schlegel and associates have used a modified Stoppa protocol in a recently published series.¹⁴ Our procedure is a further novel modification of that described by Stoppa and Schlegel not before published in the urologic literature which lends itself well to performance concomitantly with RRP.

Materials and methods

Patients considered candidates for the combined RRP/mesh-plug herniorraphy were those who presented with CaP and known inguinal hernia or those who had a hernia discovered at the time of preoperative examination and confirmed intraoperatively. All repairs were performed using a preperitoneal approach during RRP after pelvic lymph node dissection (if indicated) and before start of prostatic resection. All patients received 1 hour pre- and post-operative antibiotics consisting of a first generation cephalosporin (or other equivalent coverage in case of allergy) for the first 24 hours after start of surgery. All patients had 1/2" penrose drains inserted at the end of procedure and these were removed on post-operative day 2 or 3 when output was minimal.

Details of herniorraphy technique

The preperitoneal space of Retzius is entered and exposed according to standard radical retropubic prostatectomy techniques. (Figure 1) Pelvic lymph node dissection is performed if indicated. The hernia and accompanying defect is identified and characterized. Regardless of direct or indirect

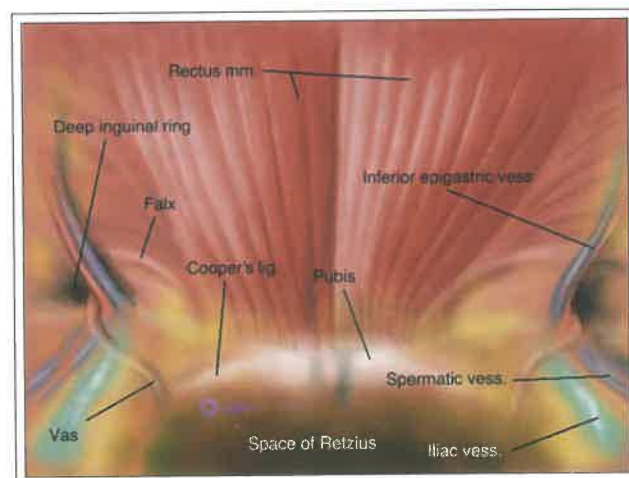


Figure 1. Anatomy of preperitoneal hernia repair. (Image reprinted with permission from Vesalius.com)



Figure 2. Cone-shaped mesh-plug of monofilament knitted polypropylene. (Bard Marlex -mesh prefix plug XL Davol, inc., Cranston RI)

pathology the hernia is mobilized and reduced with blunt dissection and it traverses the fascial defect or internal ring. Once the defect is visualized and sized, a cone-shaped mesh-plug of monofilament knitted polypropylene (Bard Marlex -mesh prefix plug XL Davol, inc., Cranston RI). (Figure 2) The plug is sized according to the diameter of the internal ring for indirect hernias and according to the fascial defect for direct inguinal

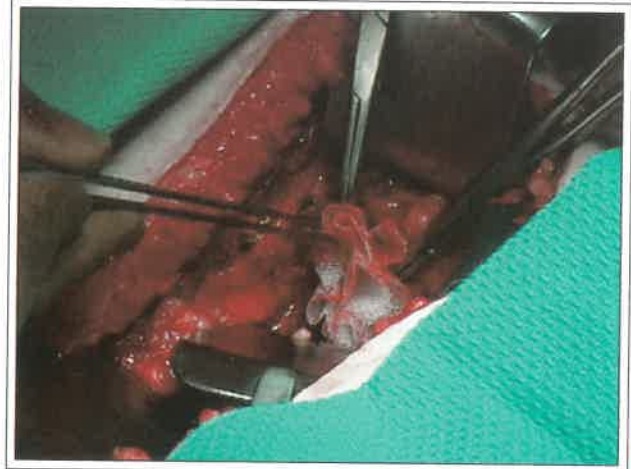


Figure 4. The mesh-plug is inserted narrow end first through the fascial defect of the direct inguinal hernia.

hernias. (Figure 3) The plug is then inserted narrow end first through the internal ring or fascial defect (Figure 4) and then sutured in place tension-free to the adjacent tissues: the iliopubic tract and transversus arch for indirect hernias and Cooper's ligament and posterior surface of the posterior wall of the inguinal canal for direct hernias with several interrupted 3-0 Nylon sutures. (Figure 5) The remainder of the prostatectomy is carried out as reported by standard procedures of Walsh and Donker.¹⁵

fig. 3(a)

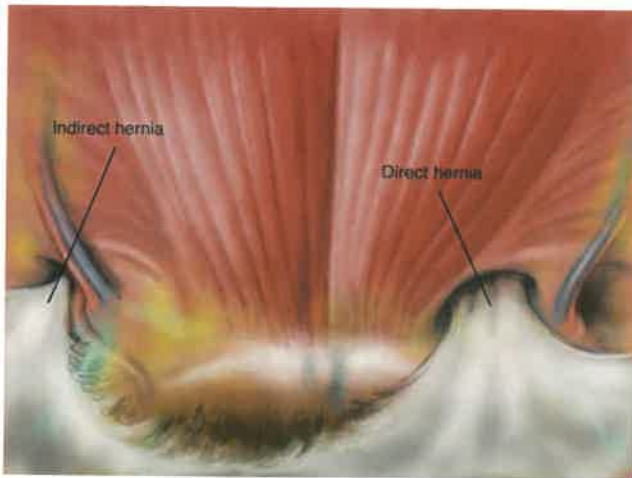


fig. 3(b)



Figure 3(a) and 3(b). The mesh-plug is sized according to the diameter of the fascial defect for the direct inguinal hernia pictured.

(Figure 3(a) reprinted with permission from Vesalius.com)

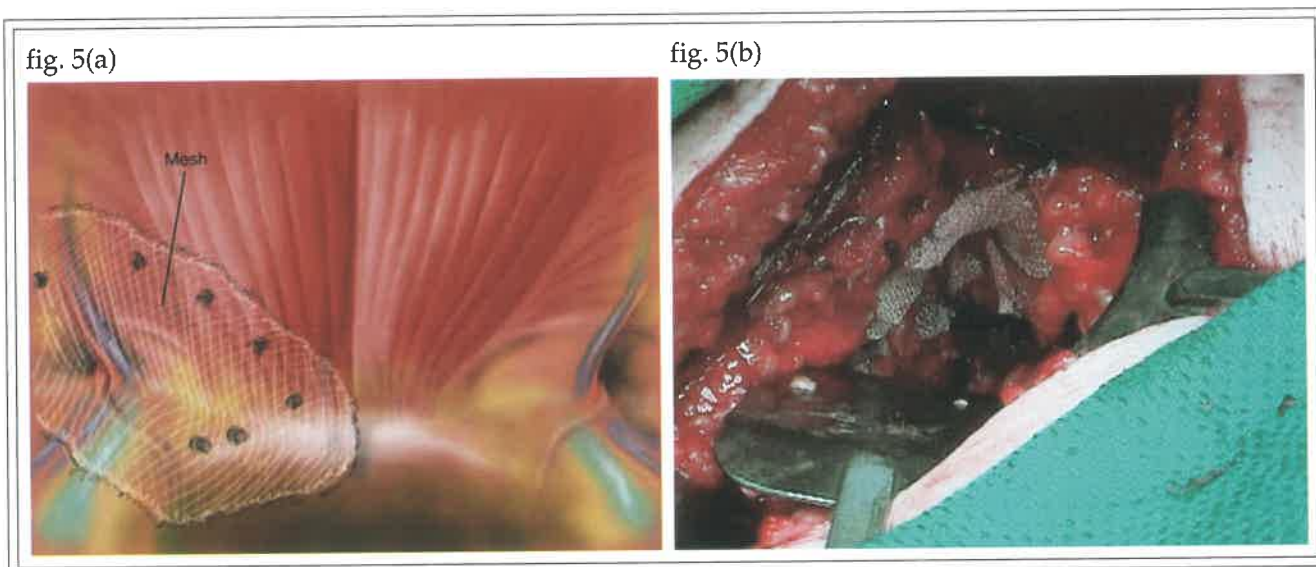


Figure 5(a) and 5(b). The mesh-plug is sutured in place tension-free to the adjacent tissues: Cooper's ligament and posterior surface of the posterior wall of the inguinal canal with several interrupted 3-0 Nylon sutures. (Figure 5(a) reprinted with permission from Vesalius.com)

Results

A total of 15 herniorraphies were performed utilizing the mesh-plug preperitoneal approach. All hernias were diagnosed preoperatively. No recurrences were seen after a median follow-up time of 18 months. No wound infections necessitating mesh removal occurred. There was no additional morbidity to the surgical procedure, surgical time was minimally affected, and there was no post operative orchalgia reported.

Discussion

Annandale first described the preperitoneal approach to hernia repair in 1876¹⁶ and since then this approach has been well recognized by hernia surgeons. This approach is especially well-suited to urologic surgeons because of the anatomic familiarity with the preperitoneal space of Retzius which houses the bladder, prostate, ureters, and other structures of importance encountered during standard urologic surgical procedures. (Figure 1) Conveniently the preperitoneal herniorraphy can be performed in combination with other pelvic surgical procedures. As noted earlier, given the dramatic increase in radical retropubic prostatectomies for early localized prostate cancer in large part related to adoption of PSA-based screening protocols, simultaneous repair of existing hernias in our patient population undergoing such

procedures intuitively makes sense. It eliminates the need for a second surgery and anaesthetic and eliminates the possible morbidity of a preexisting hernia. The previously described modified Nyhus technique of preperitoneal herniorraphy was utilized for simultaneous repair with RRP and other pelvic procedures.¹⁷ The principle drawback to this procedure was the presence of tension on the repair that is unavoidable with reapproximation of abdominal fascias. Several published series using this technique have quoted average recurrence rates of between 6% and 10% which are much greater than those anticipated or seen with tension-free mesh-plug hernioplasties.¹⁸ Schlegel and colleagues in a most recent large series of 48 patients reported no recurrences in their group of preperitoneal mesh hernioplasties.¹⁴

The placement of a mesh prosthesis into the preperitoneal space concomitantly with bladder opening may be of concern to some urologists due to fear of graft infection from urinary contamination. Urine sterility is documented in all of our patients prior to the performance of RRP and we did not see any graft infections in these patients. This may not be true with others undergoing different pelvic procedures such as simple prostatectomy for benign prostatic hyperplasia where the incidence of concomitant urinary infection may be significant. In this case antibiotic urinary sterilization should be carried out prior to procedure and perhaps the

previously described modified Nyhus nonmesh technique should be performed. Likewise, if there is rectal perforation or urethrovesical anastomosis with the risk of significant urinary leakage, a nonmesh procedure should be performed.

Conclusions

In our experience, our modified mesh-plug hernioplasty provides a convenient means to repairing an inguinal hernia at the time of radical retropubic prostatectomy. It adds only 5-10 minutes of extra operative time and provides substantial cost savings by obviating the need for second surgical procedure and anaesthetic. Herniorraphy prevents the well described complications of untreated hernias. There were no recurrences in our group of patients who underwent concomitant herniorraphy and no complications attributable to the hernia repair were noted. Therefore, simultaneous repair of clinically evident inguinal hernias should be considered and performed in patients undergoing radical retropubic prostatectomy. □

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