Article

American Journal of Robotic Surgery
Vol. 2, 32–34, 2015
www.aspbs.com/ajrs

Robotic-Assisted Simultaneous Repair of Bilateral Inguinal Hernias During Robotic Prostatectomy: A Case Report

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Robotic surgery has been implemented worldwide in general surgery, urology surgery, and gynecology surgery. However, the high cost and longer surgical times have deterred many surgeons from the utilization of this platform for shorter, routine cases, such as cholecystectomy, appendectomy and inguinal hernia repair. While performing a robotic assisted laparoscopic prostatectomy (RALP) on a patient with concurrent symptomatic bilateral inguinal hernia, it was determined it would be more efficient to approach this problem robotically rather than laparoscopically. It would have been an inefficient use of time to undock the robot and convert to a conventional laparoscopic approach. When compared to traditional laparoscopy, the learning curve for robotic assisted laparoscopy is much flatter making it much easier to adopt this technology for a concurrent procedure with urology, both prostate and inguinal hernia repair.

KEYWORDS: *Robotic Surgery, Prostatectomy, Bilateral, Inguinal Hernia, Herniorrhaphy.*

INTRODUCTION

Post-prostatectomy inguinal hernias occur in about 7%–21% of patients.[6] Fukuta et al. retrospectively reviewed preoperative CT scan in 98 patients undergoing radical prostatectomy and found 20 (20.4%) subclinical inguinal hernias.[2] Simultaneous open prostatectomy and inguinal hernia repair have been established as a safe and feasible co-operation. The first reported surgery was performed in 1949 by McDonald and Huggins.[5] Laparoscopic inguinal hernia repair has also been reported as a successful co-operation with laparoscopic radical prostatectomy.[4,7]

Since the advent of the Da Vinci robotic surgery system, the first published experience of robotic inguinal herniorrhaphy associated with transperitoneal RALP during the same surgical intervention was by Finley in 2007. Their study has shown that concurrent repair of inguinal hernias during RALP using prosthetic mesh is feasible, effective and without increased complication or morbidity.[1] Since 2007, there has been no studies that have evaluated and reported concerning these types of surgeries. However, as RALP procedures continue to grow in popularity across the globe, attention had turned towards the management of inguinal hernias during this procedure. Our intention is to support the feasibility and positive outcomes when performing robotic inguinal hernia repair with the use of coated synthetic mesh at the time if a patient undergoes a robotic prostatectomy.

The presentation of this case report is to revisit the feasibility of concurrent RALP and hernia repair, and reiterate the advantages of this effort and encourage the consideration of more collaborative surgery between general surgery and urology surgery.

CASE REPORT

This 60-year old patient was evaluated by Urology and determined to be a candidate for RALP, during his evaluation he was determined to have symptomatic bilateral inguinal hernias. In the preoperative holding unit the patient was given the option to have a combined procedure. The additional risk associated with the procedure was reviewed with the patient. The patient expressed

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Received: 4 May 2015
Accepted: 5 November 2015

an understanding and acceptance of the risk associated with the procedure and his questions were answered. The patient was brought to the operating room and positioned supine on the operating table. After successful induction of general anesthesia, administration of appropriate IV, antibiotics and time out procedure, the case was initiated by Urology. After completion of the prostatectomy, the general surgery team was notified and initiated the bilateral inguinal hernia repairs. On the patient's left side, additional dissection was performed above the Cooper's ligament and the peritoneum was taken down to expose the cord structures. The hernia sac was reduced and revealed that the patient had both a direct and an indirect component. Similarly on the right side, the peritoneum was taken down and exposed to the ileopubic tract. The general surgeon from the console isolated the cord structures and reduced the hernia sac. A lipoma of the cord was found bilaterally, both were released, and both were sent for permanent specimen. The mesh selection was an ultralight weight polypropylene coated mesh (Ventrio ST hernia patch). The mesh was custom cut to allow for encircling of the cord structures and labeled left and right. The assistant then presented the mesh into the operative field. The mesh was positioned around the cord and secured to Cooper's ligament with a tacking device (pro-tacker) (Fig. 1). Additional fixation was used on the anterior abdominal wall to ensure proper positioning of the mesh during the healing process and because the defects were noted to be large. The same sequence was performed on the opposite side (Fig. 2). The additional tacking done anteriorly was to prevent migration of the mesh into the hernia defect (Fig. 3). The decision to use the double-sided mesh was due to the size of the defect and the inability to reperitonealize over the repair.

The areas were inspected for hemostasis. The procedure was then turned over to the Urology team for their final inspection and completion of their portion of the procedure. The patient tolerated the combined procedure well and was transferred to the surgical intensive care unit as a planned post-op placement due to his cardiac history for monitoring. He was discharged on post-op day three in stable condition without any post op event.

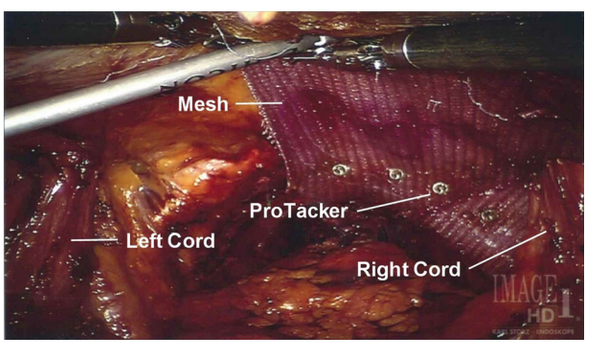

Figure 1. **ProTacking Ventrio™ ST double-sided mesh to the right side inguinal hernia.**

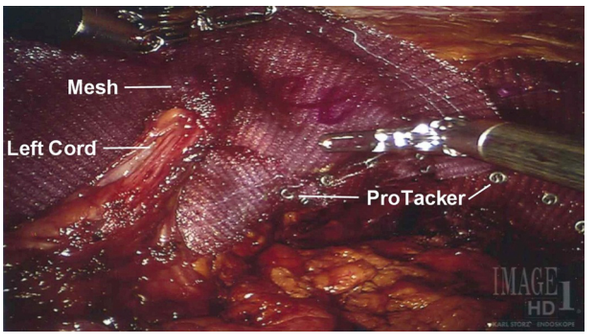

Figure 2. **ProTacking Ventrio™ ST double-sided mesh to the left side inguinal hernia.**

DISCUSSION

Robotic assistance offers several advantages over open or laparoscopic hernia repair. Some potential benefits of the robotic approach includes 3-D vision, usage of the strong and durable arms, freedom and precision of movement of the EndoWrist robotic instruments, and the ability of the surgeon to inspect the inguinal anatomy in greater detail.

Previous studies have shown that concurrent repair of the inguinal hernias during transperitoneal RALP is technically feasible, safe and effective.[1] Other studies also show that the herniorrhaphy can be performed quickly, and adds little to the overall procedure time and prevents further operative procedures for the patient (Kyle, 2007). This case report concurs with these reports. After the Urology team is essentially completed their procedure, we came in to perform the hernia repair. Our focus was to expeditiously complete our portion without undo addition of operative time. Our total additional OR time was less than 15 minutes, this was for the dissection and hernia repair of both sides. The mesh selection and cost issues go beyond the scope of this case report, suffice it is to say we selected a mesh that would achieve the goal of

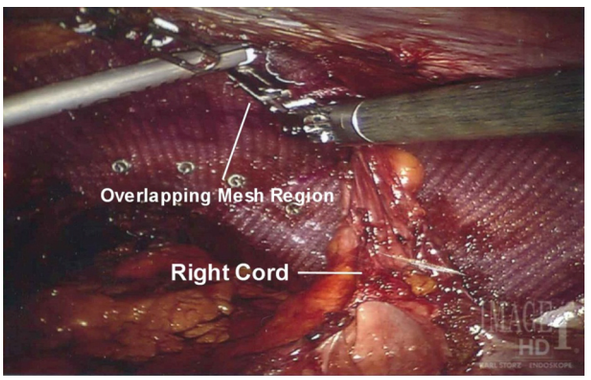

Figure 3. **Overlapping left side mesh to right side mesh.**

synthetic mesh hernia repair in a situation where we did not have peritoneum to cover our repair. There are several concerns about the use of prosthetic mesh use for hernia repair including the risk of infection and bowel adhesion. An absorbable mesh, theoretically, would reduce the risk of infection, although other studies have shown absorbable meshes to be less effective.[7] One explanation for the formation of adhesion is direct contact of the bowel to the mesh. This can be minimized with a coated mesh material. One could argue that the cost of the tacker would not take advantage of the ability to sew the mesh in with the robot. We attempted to duplicate and complement our hernia repair as it was performed laparoscopically, the time to use the tacker to secure the mesh is measured in seconds in contrast to the time for suture repair, which would be measured in minutes. Certainly it is not unreasonable to consider exploring suture repair as a reasonable alternative to the added cost of the tacker. To date, we have been performing laparoscopic hernia repair for over 20 years, both with the TAPP and the TEPP. We have performed the combined RALP and hernia repair in over a dozen cases (not yet published data), with no untoward outcome and no deviation from the normal post-operative course of the RALP.

CONCLUSIONS

Through several observations made in this case report, it is much less efficient to spend time removing robotic instruments and undocking the robot to convert to an open or laparoscopic bilateral inguinal hernia repair on a patient who is also undergoing a robotic prostatectomy. Additionally of note is the surgical plane used for the prostatectomy surgery, it would not be easily accessible in the future should a surgeon decide to approach the bilateral inguinal hernia repair laparoscopically. Despite common practice, it is not unrealistic for a general surgeon to be acquainted with or proficient in using the robotic system to allow for a combine hernia repair at the time of the RALP.

We would hope this case report would reinvigorate discussion on the collaborative effort between services toward optimum patient care.

Conflict of Interest

Zuliang Feng, Michael Feng and Willie Melvin declare they have no conflict of interest.

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