Urology Case Reports 21 (2018) 47–49

Contents lists available at ScienceDirect

Urology Case Reports

journal homepage: www.elsevier.com/locate/eucr

Functional medicine

Internal hernia secondary to robotic assisted laparoscopic prostatectomy and extended pelvic lymphadenectomy with skeletonization of the external iliac artery

K. Kambiz, MD[a,b,c,*], G. Lepis, MD, MPH[a,b,c], P. Khoury, BS[c]

[a] Department of Surgery, Monmouth Medical Center, 300 Second Avenue, Long Branch, NJ, 07740, USA
[b] Department of Surgery, Newark Beth Israel Medical Center, 201 Lyons Avenue, Newark, NJ, 07112, USA
[c] St. George's University, School of Medicine, Grenada, West Indies

ARTICLE INFO

Keywords:
Internal hernia
Complication after robotic assisted radical prostatectomy
Lymphadenectomy
Robotic-assisted radical prostatectomy
Skeletonization of external iliac artery
Pelvic lymph node dissection
Extended pelvic lymphadenectomy

Introduction

An internal hernia beneath skeletonized pelvic vasculature is a rare complication of any surgical procedure that has only been described in 6 prior cases worldwide. Still to our knowledge, only 1 prior case has been described as a strangulated small bowel internal herniation underneath a skeletonized external iliac artery after a robotic-assisted radical prostatectomy and extended pelvic lymph node dissection (ePLND). Viktorin-Baier et al. described such a case in which they repaired the herniation with resection of the bowel and resection of the elongated external iliac artery with end-to-end anastomosis.[1] Now, in the United States, we have seen a nearly identical presentation in a patient who developed internal hernia beneath the skeletonized right external iliac artery 1 year after robotic-assisted laparoscopic prostatectomy with ePLND.

Case description

The patient was a 64 year old male who presented to a community hospital with an acute onset of band-like suprapubic abdominal pain that began suddenly on a flight from California to New Jersey. He described the pain as a constant, sharp, and radiating across his lower abdomen. He reported nausea and had two bowel movements on the airplane which he described as non-bloody and of normal caliber and consistency. One year prior to presentation, patient underwent a robotic assisted laparoscopic prostatectomy with ePLND for prostate cancer with micrometastatic lymph node disease. According to the patient, the post operative course was allegedly uneventful and considering that the patient's surgery and recovery were in California, final pathology was unknown, however, we do know that 2/28 from the PLND were positive in the packet. Otherwise, patient denies any other significant past medical or surgical history. Patient was found to be hemodynamically stable and his abdominal exam revealed mild distension, tenderness to palpation in his right upper quadrant and suprapubic region with noted guarding. A CT Abdomen/Pelvis was obtained. Figs. 1–3 revealed loops of thick walled small bowel with surrounding mesenteric edema and probable pneumatosis. Figs. 1 and 2 showed compromise of the right external iliac artery, but with reconstitution noted distally at common femoral artery. The patient was taken urgently to the operating room, where he subsequently underwent a diagnostic laparoscopy, exploratory laparotomy with resection of necrotic small bowel with primary anastomosis. Intraoperatively, the necrotic small bowel had appeared to be strangulated around the right external iliac artery.

* Corresponding author. Department of Surgery, Monmouth Medical Center, 300 Second Avenue, Long Branch, NJ, 07740, USA.
E-mail addresses: Kamrani.kambiz@rwjbh.org (K. Kambiz), Grace.Lepis@rwjbh.org (G. Lepis), pkhoury1@sgu.edu (P. Khoury).

https://doi.org/10.1016/j.eucr.2018.08.017
Received 16 July 2018; Received in revised form 20 August 2018; Accepted 22 August 2018
Available online 03 September 2018

Fig. 1. This image reveals a partial bowel obstruction in the right lower quadrant with bowel wall thickening, probable pneumatosis, mesenteric edema, small amount of adjacent mesenteric fluid and compromise of the right external iliac artery.

Fig. 2. (Coronal): This image shows that the right external iliac artery is poorly opacified at the level of the obstruction and artery reconstitutes distally at the common femoral artery. There are thickened loops of small bowel again visualized in the right lower quadrant.

Discussion

In patients at high risk for nodal involvement, preoperative imaging has limited success in accurately predicting lymph node invasion and therefore, an extended pelvic lymph node dissection (ePLND) with a

Fig. 3. (Sagittal): This image reveals a saggital view of the partial bowel obstruction in the lower abdomen with surrounding mesenteric edema, fluid and bowel wall thickening.

radical prostatectomy remains the most accurate method of staging in patients with prostate cancer.[2]

Professional guidelines for the extent of PLND as outlined by the European Association of Urology (EAU), American Urology Association (AUA), and National Comprehensive Cancer Network (NCCN) vary. In summary, these guidelines have determined that patients with low risk prostate cancer do not require PLND and emphasize the use of nomograms (Briganti nomogram, Memorial Sloan Kettering Cancer Center nomogram, or Roach Formula) to stratify patients for risk of lymph node disease.

Although ePLND had increased operating time and has resulted in a longer hospital stay, no significant difference was found in the overall complication rates between lPLND (21.6% overall; 6.9% major) and ePLND (22.8% overall; 4.5% major). The most commonly seen complications included urethrovesical anastomotic leak (3.9%), symptomatic lymphocele (2.7%), thromboembolic events (2%), wound infection (2%), urinary retention (1.7%), ileus (1.7%) and blood transfusion for postoperative anemia (1.5%).[1] Similar findings were found in a study by Morizane et al. which noted that the complications of PLND could include ureteral injury, major vascular injury, obturator nerve injury, pelvic lymphocele, deep venous thrombosis, and leg/scrotal edema.[2] Neither of these studies mentioned small bowel obstruction as a complication of robotic-assisted radical prostatectomy with ePLND.

In a multi-institutional retrospective study in Japan, they compared the diagnostic efficacy and perioperative outcomes of limited pelvic lymph node dissection (lPLND) with ePLND. The cohort included 1333 patients that underwent lPLND (n = 902) or ePLND (n = 431) during robot-assisted radical prostatectomy. Multivariate analysis revealed that console time ($p = 0.001$) was significantly associated with major complications, however the extent of lymphadenectomy ($p = 0.272$) was not. In the ePLND cohort, 60.4% of patients had positive lymph nodes only in the obturator/internal iliac region. 22.6% of patients with positive lymph nodes were only positive in the external common iliac region. Despite significant increases in console time and blood loss in the ePLND cohort, the lymph node yield was nearly quadrupled.[1] Both studies reinforce the notion that ePLND is the standard of care in high risk prostate cancer patients.

Specifically, there have been studies comparing the risks after a robotic-assisted vs. open radical prostatectomy. Either technique is considered adequate for the treatment of prostate cancer, yet robotic-assisted prostatectomy, which remains the most common approach in the United States, is predominantly performed via the intraperitoneal route whereas the peritoneum is not entered during open retropubic radical prostatectomy. Intraperitoneal surgery introduces intra-abdominal adhesions and accounts for nearly half of all cases of small bowel obstruction after gynecological and general surgeries.[3] Lundström et al. concluded that in the first postoperative year, intraperitoneal robotic-assisted radical prostatectomy has an increased risk of readmission for small bowel obstruction [hazard ratio (HR) 1.92, 95% confidence interval (CI) 1.14–3.25] and admission for abdominal pain (HR 2.24, 95% CI 1.50–3.33). However, after 5 years there no longer remains a significant difference between the two techniques for small bowel obstruction (HR 1.28, 95% CI 0.86–1.91) and abdominal pain (HR 1.23, 95% CI 0.92–1.63).[4] Loeb et al. compared the two techniques by examining the cumulative incidence of small bowel obstructions and lysis of adhesions in patients treated with robotic-assisted vs. open radical prostatectomy. They determined that robotic-assisted radical prostatectomy is not associated with an increased risk of postoperative small bowel obstruction and lysis of adhesions and ultimately, no significant difference was found between the two techniques on multivariable analysis.[5]

Conclusion

Given the rare number of reported cases documented in the literature worldwide and the increasing number of robotic assisted laparoscopic prostatectomies performed with an ePLND, it is important to consider an internal hernia beneath skeletonized pelvic vasculature in a patient who presents with acute abdominal pain with a history significant for a robotic assisted laparoscopic prostatectomy with extended pelvic lymphadenectomy. Awareness, prompt diagnosis and urgent surgical intervention are imperative to treating patients with this particular complication.

Conflicts of interest

None declared.

Appendix A. Supplementary data

Supplementary data related to this article can be found at https://doi.org/10.1016/j.eucr.2018.08.017.

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