

Bladder perforation during laparoscopic donor nephrectomy

P. D. Metcalfe, MD, L. Hickey, MD, J. G. Lawen, MD

Department of Urology, Dalhousie University, Halifax, Nova Scotia, Canada

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We present two cases of bladder perforation during laparoscopic donor nephrectomy at our institution. Neither of the surgeries was otherwise complicated, and the diagnoses were made post-operatively. The kidneys were extracted through a Pfannenstiel incision and used

blunt dissection to penetrate the peritoneum. Both patients had previous tubal ligations, adhesions from which may have increased the chance of injury. We believe that this is a previously unreported complication that merits attention. Care should be taken with the peritoneal incision and dissection as the bladder may be susceptible to injury.

Key Words: bladder injury, laparoscopic donor nephrectomy, kidney transplantation

Introduction

Laparoscopic surgery is heralded as providing excellent surgical results with less patient morbidity. However, as the number of procedures increases, so do the number of reported complications. We present two cases of unrecognized bladder perforation during laparoscopic donor nephrectomy, a previously unreported complication.

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Address correspondence to Dr. JG Lawen, Department of Urology, Rm. 5015 - 5 South, Centennial Bldg, Victoria General Site, QEII Health Sciences Centre 1278 Tower Road, Halifax, NS B3H 2Y9 Canada

Case report one

A 57-year-old female was evaluated and recommended as a potential kidney donor to her son. Past medical history includes medically controlled rheumatoid arthritis, five children and a previous tubal ligation. Review of systems revealed some mild lower urinary tract symptoms, but were not bothersome enough to warrant investigation or treatment. After discussion of the risks and benefits of the procedure, she consented to a laparoscopic left donor nephrectomy.

A standard, uncomplicated intraperitoneal left laparoscopic donor nephrectomy was performed in the flank position. The kidney was freed of all attachments and the hilum meticulously dissected.

After isolation of the vessels, a 10 cm Pfannenstiel incision, 2 cm above the symphysis pubis, was made at a site marked before positioning to her flank. Sharp dissection and electrocautery were used to deepen the incision to the peritoneum, whereupon, the renal vessels were individually transected with the vascular stapler. Blunt finger dissection was used to penetrate through the peritoneal layer in order to maintain an air tight access. No difficulties or complications were noted, and operative time was approximately 2 hours, with 4 minutes of warm ischemia.

The post-operative course was complicated by an unexplained elevation in her creatinine (pre-operative = 87 $\mu\text{mol} / \text{L}$, POD #1= 124 $\mu\text{mol} / \text{L}$, and POD #2 = 237 $\mu\text{mol} / \text{L}$). This was accompanied by a disproportionate amount of abdominal pain and urinary retention. Intermittent catheterization was required for 3 days, whereupon satisfactory voiding and lack of residual urine was achieved. The patient subsequently developed an ileus and diarrhea, which resolved spontaneously. Total duration of stay was 11 days. Creatinine at discharge was 108 $\mu\text{mol} / \text{L}$.

She was re-admitted to a peripheral hospital approximately 1 week later with lower urinary tract symptoms. At this time, an extra peritoneal bladder perforation was discovered and treated with a foley catheter. Unfortunately, her course was further complicated by a small bowel obstruction, which necessitated laparotomy and small bowel resection.

Case report two

A 35-year-old female consented to a laparoscopic left donor nephrectomy to her mother. Past medical history included gallstones, four vaginal deliveries and a tubal ligation.

An uncomplicated renal dissection and extraction was performed. Because of the aforementioned case, the peritoneum was entered more cranially and laterally in an attempt to avoid any trauma to the bladder.

Immediately post-operatively the patient complained of an unexpected amount of right sided pelvic pain. On post-operative day 2 the foley catheter was removed, but she was unable to void and her serum creatinine was 189 $\mu\text{mol} / \text{L}$. Cystogram demonstrated extraperitoneal extravasation in the right anterolateral area (contralateral to side of nephrectomy) Figure 1a and 1b. Flexible cystoscopy revealed a large defect on the right side of the bladder consistent with the defect demonstrated on the cystogram. Due to the size of the defect, arrangements were made for open repair.

At laparotomy injuries were identified at the dome of the bladder and the right posterolateral wall. The right anterior bladder was adherent to the pubis. The defects were closed in two layers and foley catheter left in for 2 weeks. Subsequent cystogram was normal and the foley was removed.

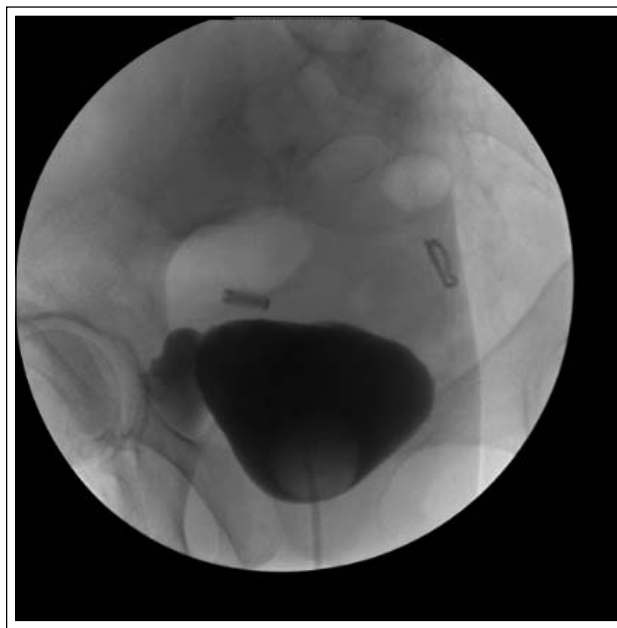


Figure 1a. AP cystogram demonstrating extravasation of contrast on the right side of the bladder.

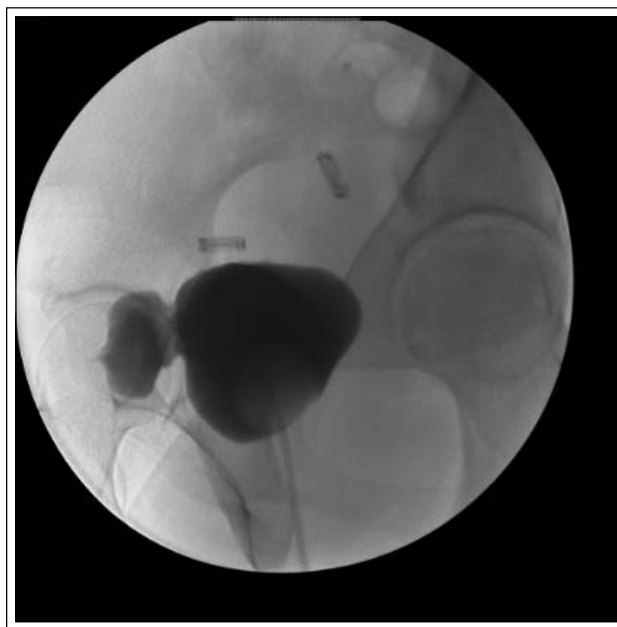


Figure 1b. Oblique view of same patient, demonstrating the posterior nature of the defect.

Discussion

Laparoscopic donor nephrectomies have been successfully performed in many centers and have a low complication rate. Several reviews have recently been published.¹⁻⁵ Iatrogenic injuries have been described involving vessels and adjacent organs during port placement, insufflation, and renal dissection. While urinary retention has been reported in 0.9% – 5.5% of cases¹ it has not previously been associated with bladder injury.

Bladder injuries have been reported with pelvic laparoscopy, primarily with hysterectomy and colectomy.⁶⁻⁸ Many of the injuries manifest post-operatively as fistulae, and have been attributed to electrothermal damage.⁹

Our technique has been used successfully in over 40 laparoscopic donor nephrectomies without any major complications (unpublished data). We believe that the bladder injuries occurred during the intraperitoneal hand placement. The open bladder repair revealed that the injury was on the contralateral wall and, therefore, not likely a direct injury. The peritoneal traction during the blunt dissection through the peritoneum may have resulted in an excessive shearing force across the peritoneal reflection and was transmitted to the opposite bladder wall. Although this did not seem significant at the time, these bladders may have been especially thin or weak. The previous tubal ligations may have resulted in adhesions that tethered the bladder in the pelvis and contributed to the shearing nature of the injury.

Conclusion

Bladder perforation is a previously unreported complication of laparoscopic donor nephrectomy. This complication should be suspected in patients with an inordinate amount of suprapubic pain, an elevated creatinine, or urinary retention. Preventative measures include recognition of the entity, appropriately placed incisions, and a cautious, controlled entry into the peritoneum. □

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