



## Urinary ascites in late onset of bladder injury post laparoscopic hysterectomy



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### ABSTRACT

Urinary tract injuries are unfortunate complications of pelvic surgery. With the increasing popularity of minimally invasive surgery, a thorough understanding of electrosurgical instrumentation and their thermal spread is important to reduce patient injuries.

The index patient was a 50 year old woman who underwent a supracervical hysterectomy 5 years prior to her presentation with pelvic pain and dysuria. When her symptoms failed to improve despite antibiotic and analgesic therapy, an abdominal CT scan revealed an ovarian cyst and ascites. A subsequent laparoscopy disclosed the presence of a bladder fistula and a diagnosis of urinary ascites was made. The patient then underwent a subsequent bladder fistula repair.

Vesicoperitoneal fistulae (VPF) are rare and should be included in the differential diagnosis of the patient with acute onset ascites following gynecologic surgery. This case is the first case report of a VPF occurring 5 years following surgery.

### 1. Introduction

Lower urinary tract injuries are among the most common delayed complications following laparoscopic hysterectomy [3]. Historically, vesicoperitoneal fistulae (VPF) occur a consequence of multiple pelvic surgeries—for example, repeat cesarean sections—which may render bladder dissection difficult in the presence of adhesions [4]. While delayed thermal injury has emerged as a major contributor to fistula formation, other predisposing factors include co-existing pelvic pathology, distortion of normal anatomy and extensive surgeries such as radical hysterectomy.

The use of certain suture material such as silk, or other permanent materials has also played a role in the genesis of fistulas. VPF is a rare complication that may occur after laparoscopic hysterectomy [5]. With the increasing utilization of bipolar vessel sealing devices, knowledge of their bio-effect is important to reduce complications [1]. We present a unique case of a spontaneous and delayed VPF that occurred 5 years after a subtotal hysterectomy in a patient who presented with abdominal pain, ascites, oliguria, and acute renal failure.

### 2. Case Report

The patient is a 50 year old G2 P2002 with the following history. In

March 2011 she underwent a laparoscopic supra-cervical hysterectomy as treatment for abnormal uterine bleeding (AUB) secondary to uterine leiomyomata with failed medical treatment. Her surgical procedure was performed with the adjuvant use of a bipolar vessel sealing device (ACMI GyruS PKS Cutting Forceps 5 mm × 33 cm Model 920005PK Southborough, MA) which was employed for the transection of the round, ovarian and uterine pedicles, followed by amputation of the uterine corpus from the cervix uteri. A routine intraoperative cystoscopy was performed with the aid of indigo carmine and the despite the finding of bilateral ureteric jets a thermal injury at the left dome of the bladder was visualized. A Urology consultation recommended bladder decompression with a Foley catheter for a period of 10 days and suggested that the patient be re-evaluated following the catheter's removal with a CT Urogram; she received prophylactic nitrofurantoin. The CT Urogram was negative on the 10th postoperative day.

Twenty months following her surgery—microscopic hematuria was noted during the routine GYN visit. Urine culture and cytology were negative. A Urology consultation was obtained and CT urogram and cystoscopy were performed. The cystoscopy revealed a normal-appearing bladder mucosa with a scar at the left posterior bladder wall at the site of the prior thermal injury; the bladder cytology was negative.

In June 2016—over 5 years following her supra-cervical hysterectomy—she presented to her primary care physician with a 5 day

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history of suprapubic pain and dysuria and was treated empirically for cystitis with Ciprofloxacin 500 mg orally BID for 7 days. The following day, she complained excruciating abdominal pain that was exacerbated by urination. A CT scan of the abdomen and pelvis revealed significant feces in the colon, mild ascites, a 1.5 cm simple right ovarian cyst and a normal appendix—no obstructive uropathy or nephrolithiasis was detected. Her serum creatinine was normal. The patient was treated for constipation and was instructed to follow up with her gynecologist. Two days later, with unimproved pain, a repeat CT scan revealed increasing ascites while her serum creatinine had increased from 1.4 to 3.0 mg/dL. Because of her deteriorating condition the patient was taken to the OR for exploration.

At laparoscopy, copious amounts of clear amber-colored fluid were noted along with normal fallopian tubes and ovaries; there was a simple right ovarian cyst present and no pelvic adhesions were demonstrated. A bilateral salpingo-oophorectomy was performed at the patient's request. The bladder was then back-filled with sterile saline and a 1.5 cm defect was visualized in the left posterior bladder dome—a cystoscopy confirmed a vesicoperitoneal fistula. A Foley catheter was placed in order to decompress the bladder and the patient was scheduled for fistula repair in 4 weeks.

One month later, the patient underwent a Robotic assisted Laparoscopic cystorrhaphy. The fistula was excised and detrusor muscle was identified surrounding the defect. The bladder was then closed in 2 layers—the first with 2-0 V-Loc (Covidien, New Jersey) and the final layer with a suture of 3-0 polyglactin 910 (Vicryl) (Ethicon, New Jersey). At her six week follow-up visit, the patient reported no further urinary symptoms.

### 3. Discussion

Urinary tract injuries are a well-known complication of gynecologic surgery. In a series of 8824 subjects undergoing major gynecologic procedures, Bai et al. [6] reported an incidence of urinary tract injuries to be 0.33% with the majority occurring during abdominal hysterectomies. A meta-analysis by Ostrzenki and Ostrzenska [3] found that the rate of urinary tract injuries range from 0.02–8.3%, with bladder injuries a leading cause of visceral injuries occurring during laparoscopic surgeries. The issue of urinary tract injuries is important given that in the United States alone over 400,000 hysterectomies are performed annually; the vast majority for benign indications [7].

Since the introduction of laparoscopic hysterectomy in 1989 [8], the incidence of bladder injuries has been increasing. These injuries have been variously attributed to the insertion of a Verres needle, trocar placement and bladder dissection from the cervix. Factors that influence the risk of bladder injuries include intraoperative complexity, distortion of pelvic anatomy and individual surgical experience [9]. Other factors include the substitution of conventional suture ligation techniques for bipolar vessel sealing devices [10].

In cases of suspected bladder injury, the intra-operative instillation of methylene blue often confirms the diagnosis [11]. Other diagnostic modalities include cystoscopy, which will identify 85–90% of unsuspected lower urinary tract injuries at the time of gynecologic surgery [12]. Of those cases that present with ascites, analysis of the ascitic fluid may confirm the diagnosis [13]. Biochemical abnormalities such as electrolyte disturbances, elevated blood urea nitrogen and serum creatinine may also be helpful diagnostic tests.

Early detection of urinary tract injuries is important since prompt recognition and repair obviates both immediate and delayed complications. Immediate complications include fever, hematuria, oliguria, abdominal pain and distension [14]—typically occurring within the first few weeks postoperatively. Delayed complications include ascites, vesicovaginal and vesicoperitoneal fistulae, which may present months and years following surgery.

Methods of preventing bladder injury include a thorough understanding of the anatomy, proper surgical planning and technique.

Proper technique includes the placement of secondary trocars under direct visualization [2], a thorough understanding of the various electrosurgical modalities and their bio-effects, and the placement of an indwelling Foley catheter equipped with a 3-way attachment [1,2,15]. The latter provides several benefits including bladder decompression at the time of Verres needle and trocar insertion. An additional benefit a Foley placement is to allow retrograde filling with methylene blue during critical periods of dissection [11].

The scientific data confirm that operator experience is inversely related to bladder and other visceral injuries. Clearly those patients who are at high risk for bladder injury—women with prior abdominal surgery [6] or cases in which extensive dissection is required—may benefit from the presence of a physician with a greater surgical volume [9].

Injuries that are less than 1 cm may be managed conservatively with an indwelling Foley catheter for 5–7 days [16] at which time a follow up cystogram is performed in order to ensure proper closure. Larger injuries should be closed at the time they are recognized. Minas and colleagues [17] recommended that thermal bladder injuries should be managed by debridement prior to repair and closed regardless of their size.

In the index case the patient was managed conservatively with an indwelling catheter. In retrospect, it was possible that there was an unrecognized full thickness thermal injury at the time of her hysterectomy, which, over time, caused retraction of the detrusor muscles. The integrity of the bladder was likely upheld by the overlying adherent peritoneum.

This case is unique inasmuch as this is the first publication of a bladder injury presenting with urinary ascites 5 years following the inciting surgical procedure. Most cases that have been reported, present within several days to weeks of the inciting event, with signs and symptoms of pain and ascites [3,10]. This case highlights the fact that a high index of suspicion is required for the prompt recognition of a suspected vesicoperitoneal fistula. In this case, the injury was recognized and a successful outcome occurred following a repair in 2 layers using an absorbable suture [18,19].

### 4. Conclusion

Although, vesicoperitoneal fistulae are rare complications following hysterectomy, they can be misdiagnosed as ascites if the inciting surgery was remote. In patients with history of a prior hysterectomy, symptoms and signs that include dysuria, acute abdominal pain, unexplained ascites, increasing creatinine, should alert the gynecologist to the suspicion of a vesicoperitoneal fistula. A normal postoperative cystogram in the immediate perioperative period does not exclude the delayed formation of a vesicoperitoneal fistula. This case illustrates the value of primary debridement and full-thickness repair following a thermal injury to the bladder.

### Conflict of Interest

None.

### Disclosure

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