



Vesico-peritoneal fistulae after cesarean section: Insights from three case studies

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ABSTRACT

Vesico-peritoneal fistula represents an abnormal path between the abdominal cavity and the bladder. In this study, we present three clinical cases of vesico-peritoneal fistula that developed after cesarean section, each exhibiting symptoms of pain and abdominal distension. The first case involved a bladder injury that was identified intraoperatively during the C-section and was promptly repaired. The remaining two cases were associated with thermal injuries inflicted by electrocautery during the surgical procedure. In all three patients, laboratory analyses revealed that urea and creatinine levels remained within normal limits. Diagnostic approaches varied: Two cases were diagnosed through transabdominal ultrasound-guided needle aspiration of ascitic fluid, while the third case was confirmed via cystogram. Therapeutic intervention for all cases involved cystoscopy, surgical excision of the fistula tract, excision of the bladder fistula, and subsequent multilayered bladder repair utilizing an omental flap. Postoperative management included a 10-day period of bladder drainage, after which all patients demonstrated uneventful recoveries. These findings underscore the importance of recognizing vesico-peritoneal fistula as a potential complication of C-section, particularly in the context of intraoperative bladder injury or electrocautery use.

Keywords: Cesarean section; vesico-peritoneal fistula; surgical complications; bladder injury; fistula diagnosis

INTRODUCTION

Cesarean section (CS) is a widely performed surgical intervention globally, aimed at mitigating risks to both mother and neonate when vaginal delivery is considered unsafe. Despite its frequent and routine nature, CS are not devoid of complications. One of the reported complications is urinary bladder injury occurring in 0.18% of all cesarean deliveries.¹ Bladder injury during primary

CS is 0.2% and during repeat CS is 0.6%.² The most common site of bladder injury was reported to involve the dome of the urinary bladder in that in 94% of cases.³

Among the rarer but clinically significant complications of CS is the development of vesico-peritoneal fistulae. A vesico-peritoneal fistula represents an abnormal communication between the urinary bladder and the peritoneal cavity, leading

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to substantial morbidity if not accurately diagnosed and promptly managed. Bladder injuries during CS often result from surgical difficulties encountered while creation of a bladder flap over the lower uterine segment, usually due to scar tissue from previous surgeries. These injuries are most often attributable to ureteral transection or ligation associated with uterine incision extensions in the lower uterine segment or the vagina, and to attempts to achieve hemostasis.⁴

This article aims to elucidate the complexities of vesico-peritoneal fistulae subsequent to CS through a detailed examination of three distinct case studies. By analyzing the clinical presentations, diagnostic methodologies, therapeutic interventions, and outcomes associated with these cases, we seek to provide the medical community with a comprehensive understanding of this rare complication. Furthermore, we will underscore the necessity of a multidisciplinary approach in managing such intricate postoperative conditions. The insights gleaned from these cases will inform strategies for prevention, early detection, and effective management, ultimately enhancing clinical practice and patient care.

MATERIAL AND METHODS

Case 1

A 36-year-old woman gravida 2, parity 2 admitted to hospital with abdominal distention six weeks after her second cesarean delivery. Pelvic gynecological examination was normal except ascites seen on transvaginal and transabdominal ultrasound without any pelvic or abdominal mass or pyelectasia. Transabdominal ultrasound guided sampling of the clear peritoneal fluid was done and analysis revealed a creatinine level of 9.5 mg/dL indicating urinary ascites. Intravenous pyelography revealed contrast leakage from left posterior bladder wall. Her blood biochemical analysis was normal for urea, creatinine and hemogram was normal. She was operated immediately with Pfannenstiel incision and cystoscopy concomitantly. Cystoscopy guided double J guide insertion to the fistula showed a vesico-peritoneal fistula tract neighboring left side of the Kerr incision of the uterus. Her obstetrician was contacted and recalled that electrocoagulation of bleeding vessels between the bladder and vaginal wall was done on the left side of the Kerr incision. After fistulectomy and repair of the bladder with 2.0 polyglactin sutures, omental flap was placed between the bladder and the uterus. The bladder was then distended with methylene blue diluted in 400 mL of sterile saline and no leakage was seen. Foley catheter was kept in place for 10 days and the patient recovered uneventfully.

Case 2

A 28-year-old gravida three parity three woman admitted to emergency with abdominal distention, fever, and vaginal discharge. She had history of third cesarean section for placenta previa and placenta accreta spectrum four weeks ago. On pelvic examination she had clear fluid leak from the cervix. Transvaginal and transabdominal ultrasound showed no abdominal or pelvic mass but ascites. Also, there was a 2x4 cm fluid accumulation on right posterior side of the bladder not related to the adnexa. Transabdominal sampling of turbulent pale-yellow ascites revealed creatinine of 16 mg/dL. Her urine analysis revealed nitrite ++ positive urine with increased leucocyte and bacteria on microscopic examination of the urine. Her white blood cell (WBC) count was $1.5 \times 10^3/\mu\text{L}$ C-reactive protein (CRP) was 100 mg/L. Cystography was performed and two fistula tracts was observed one from bladder to cesarean Kerr incision to the uterus the other to the right side of the pelvic peritoneum near the round ligament. A Foley catheter was placed and extended spectrum antibiotic therapy with ceftriaxone 3 gr/day and cleocin 600 mg/day was commenced. After 48 hours of antibiotic therapy WBC drop to $9.5 \times 10^3/\mu\text{L}$ and CRP drop to 32 mg/L. She was operated with Pfannenstiel incision. Methylene blue installation was done to guide the fistula planes and methylene blue was observed to leak from the cervix too. The urinary bladder was dissected away from the uterus. Kerr incision was excised and revised at the midline with fistulectomy at the dome of the bladder. The vesico-peritoneal fistula tract on the left side anterior to the Kerr incision was 1 cm away from the left ureter entrance to the bladder. A double J catheter was placed to the left ureter, fistulectomy and repair of the bladder with 2.0 polyglactin sutures was performed. Omental flap was placed between the uterus and the fistula tracts. Foley catheter was kept in place for 10 days with antibiotic therapy and the Double J catheter removed with cystoscopy one month after the operation. She recovered uneventfully.

Case 3

A 32-year-old gravida 2 parity 2 woman admitted to emergency room with abdominal pain and distention. One month ago, she had a cesarean section and had an intraoperative bladder injury with primary repair of the injured area. WBC count was within normal limits ($8.44 \times 10^3/\mu\text{L}$), CRP was 8.4 mg/L and creatinine level was 2.19 mg/dL.

Abdominal ultrasound showed diffuse fluid in the abdominal cavity. Vesico-peritoneal fistula due to previous surgery was suspected. Paracentesis was performed and after biochemical examination detected a creatinine level of 12 mg/dL, it was found to be compatible with urine. A cystogram was performed

afterwards and contrast fluid passage into the abdominal cavity was observed (Figure 1). After the diagnosis, cystoscopy was performed and simultaneous laparotomy was performed to visualize the defect in the bladder (Figure 2). Then the bladder defect at the dome of the bladder was repaired in a multilayer fashion with 2.0 vicryl via laparotomy and an omental flap was placed over it. After repair, the bladder was inflated with methylene blue diluted saline and no leakage was observed. After discharge, the patient's catheter was removed 14 days later and a control cystogram was performed and no pathology was observed on the cystogram.

DISCUSSION

Vesico-peritoneal fistula is a rare but important complication of obstetric surgery. Although emergency cesarean delivery, and cervical dilatation of 9-10 cm were proven risk factors for bladder injury, our cases were all elective cesarean deliveries without cervical dilatation.⁵ Risk of bladder injury increased in cesarean delivery cases with placenta previa 2.2 (1.9-2.4) as in one of our cases and repeat cesarean delivery 4.3 (4.1-4.6) as in all our cases.¹ Gungorduk et al.⁶ found that women with bladder injury were more likely to have had a previous cesarean section compared to the control group (72.4% vs. 34.2%; $p < 0.001$).



Figure 1. Passage of contrast medium into the peritoneal cavity on cystogram

In a meta-analysis by Jensen et al.⁷ it was reported that bladder injuries were recognized during the operation in 90 percent of the cases and post-repair complications were seen in 1 percent of the cases. Although recognition of bladder injury during cesarean section may decrease the morbidity of the patient, fistulas may occur late due to electrocoagulation as in one of our cases. Also, fistulas can occur despite primary repair of the bladder injury recognized during the operation as in one of our cases.

In the presence of vesico-peritoneal fistula, patients may present to the hospital repeatedly at different times with complaints of abdominal pain and abdominal distension, with or without fever.

In our cases, admission occurred between 28 to 42 days after the first operation, one of the three patients complained of fever but all patients had clinically evident abdominal distention easily diagnosed as ascites by ultrasonography. The biochemical analysis of transabdominal ultrasound guided ascite samples in our cases yielded a higher creatinine level than the upper cut-off value of 1.5 mg/dL for serum which indicates urine leakage to the peritoneal cavity. Although this comparison was also used to diagnose late urine leakage in other studies, early abdominal drain creatinine cut-off level for prediction of urine leakage after genitourinary surgery was set at ≥ 30 mg/dL.^{8,9} Unlike vesicouterine and vesico vaginal fistulas where vaginal urine leakage raises the suspicion of bladder injury, vesico-peritoneal fistulas admit with abdominal distention as the main symptom.^{10,11} Nevertheless, both vesico-peritoneal and vesicouterine fistulas can be observed rarely in the same case as reported in the literature and in one of our cases.¹⁰

In our cases, 10 to 14 days of Foley balloon drainage after appropriate repair was sufficient. Previous studies reported 1 to

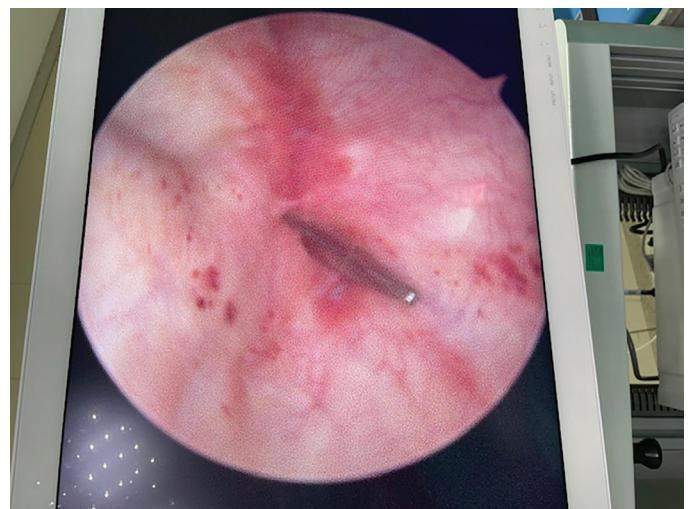


Figure 2. Cystoscopic view of the instrument passed through the vesicoperitoneal fistula tract via laparotomy

42 days of transurethral catheterization where most reports had a median of 7 to 14 days as in our cases.⁷ Although no control graph was mentioned in the literature a control cystogram was performed after 14 days of catheterization in one of our cases to evaluate the bladder integrity and no extravasation was observed. As recurrent fistula was reported after fistula repair in 1.3% of the cases and unsuccessful repair was rare the use of control cystography should be case specific.⁷

We would like to conclude that vesico-peritoneal fistulas should be considered in the differential diagnosis of acute abdominal distention with ascites within several months after cesarean section in whom high creatinine level in ascites samples indicate urine leakage into the peritoneal cavity.

FOOTNOTES

Contributions

Surgical and Medical Practices: Ö.F.S., E.Ç., Concept: Ö.F.S., E.Ç., Design: Ö.F.S., E.H.C., Data Collection or Processing: Ö.F.S., E.H.C., Analysis or Interpretation: E.H.C., Literature Search: Ö.F.S., E.H.C., Writing: Ö.F.S., E.Ç.

DISCLOSURES

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