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Trauma and reconstruction

Challenges in the diagnosis of delayed presentation of intraperitoneal Iatrogenic bladder trauma post Caesarean delivery: A case report

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ABSTRACT

Iatrogenic bladder trauma (IBT), a rare complication of Caesarean delivery (CD), can present with delayed symptoms, posing diagnostic challenges. A case study reports IBT presenting six days post-CD, initially undetected by retrograde cystography and CT urography. Subsequent surgical exploration revealed an 8-cm wound in the bladder dome, concealed by a hematoma and enlarged uterus. While retrograde cystography is typically accurate, false negatives may occur. CT cystography offers higher sensitivity but may still miss small perforations. Delayed IBT can manifest with abdominal pain, hematuria, and elevated renal function tests, warranting clinical suspicion and consideration of surgical exploration despite negative imaging.

1. Introduction

Iatrogenic bladder trauma can be caused by several etiologies, such as obstetric and gynecological surgery, urological operations, general surgical operations, and the insertion of a Foley catheter.[1] Iatrogenic bladder trauma after cesarean delivery (CD) is a rare complication, ranging from 0.08% to 0.94%.[2] Women with a history of previous CD, emergent CD, or adhesions are at a higher risk of IBT.[1,2] Diagnosis of IBT is mainly made in intraoperative settings, but several case reports have demonstrated delayed presentation of IBT.[3,4] This report presents a delayed presentation of IBT without abnormal radiology findings and is written in accordance to the SCARE guidelines.[3]

1.1. Case presentation

A 29-year-old preterm primipara woman with the history of laparotomy appendectomy 14 years ago experienced premature membrane rupture and oligohydramnios underwent a cesarean section. Intraoperatively, severe adhesions were found between the rectus muscle, peritoneum, uterus, bowel, and omentum. Postoperative care was unremarkable, and the patient was discharged with no other symptoms the next day. On day three after delivery, the patient began to experience abdominal pain, but the pain was still manageable with oral painkillers. On postpartum day six, the patient noticed hematuria and went to the emergency department.

She was readmitted with hematuria and abdominal pain. A distended abdomen, an infected surgical site, ascites, and minimal bowel sounds were observed on physical examination. The 22-Fr Foley catheter was inserted, and gross hematuria was noticed. Significant laboratory findings were anaemia (Hb 9.4 mg/dL), leucocytosis (20.340/mL), high blood urea (122,0 mg/dL), and high serum creatinine (2,30 mg/dL) mimicking acute renal failure. Abdominal ultrasound showed intraluminal fluid with heterogeneous echogenicity which raised the suspicion of intravesical haemorrhage. Furthermore, there was gross ascites, but the defect in the bladder wall cannot be identified. Retrograde cystography was performed by instilling 540 ml of contrast and did not show a leak of contrast into the peritoneal cavity (Fig. 1). The bladder patency test showed the same amount of injected and aspirated fluid. Computed tomography (CT) urography with delayed phase showed an irregularity in the superoanterior segment of the bladder wall and suboptimal bladder filling without contrast pointing to an abnormal filling defect, and there was no concomitant ureteral injury (Fig. 2). With persistent hematuria and increased abdominal distention, we cannot rule out iatrogenic bladder trauma, and an emergency surgical operation was planned.

An open surgical approach was performed with general anaesthesia. The incision was made at the previous surgical site. Massive ascites and hematomas filled the entire peritoneal cavity. An 8-cm clean-cut wound was visible in the bladder dome (Fig. 3). The bladder mucosa was closed with continuous stitches using a 4-0 polyglactin suture, and the muscular layer was closed with an interrupted suture using a 3-0 polyglactin suture. A patency test was performed and no leakage was

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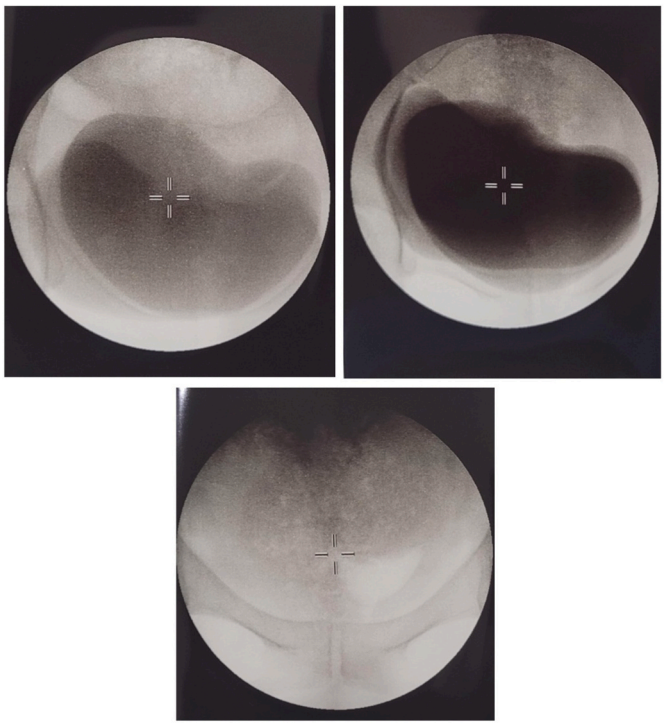

Fig. 1. Retrograde cystography was performed by instilling 540 ml of contrast and did not show a leak of contrast into the peritoneal cavity.

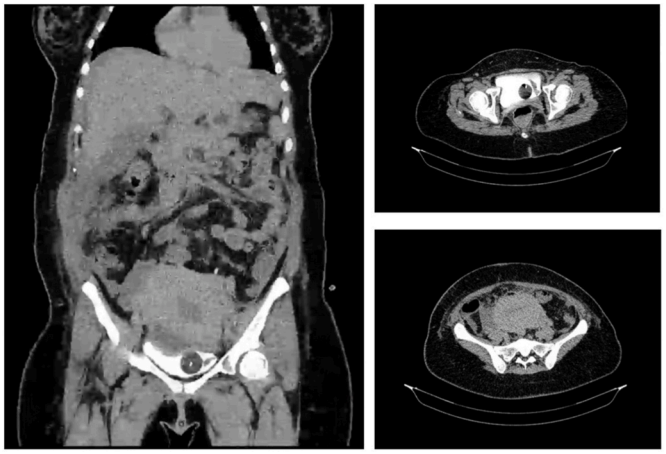

Fig. 2. CT urography with delayed phase showed irregularity in the superoanterior segment of the bladder wall and suboptimal bladder filling without contrast pointing to an abnormal filling defect.

observed in the bladder or ureters. According to the evaluation, there was no active bleeding. The 18-Fr nasogastric tube drain was left in the intraperitoneal. The patient was stable after surgery and had no other notable events during postoperative care. The patient was discharged two days later with urinary production of 2000 mL/24 hours. Retrograde cystography was performed two weeks later, and no contrast extravasation was observed.

2. Discussion

A delayed presentation of IBT is a rare case, and only a handful of publications have reported this disease.[4,5] The clinical presentation of delayed IBT includes gross hematuria, abdominal distension, abdominal pain, peritonitis, ileus, sepsis, urine leakage from the wound, decreased

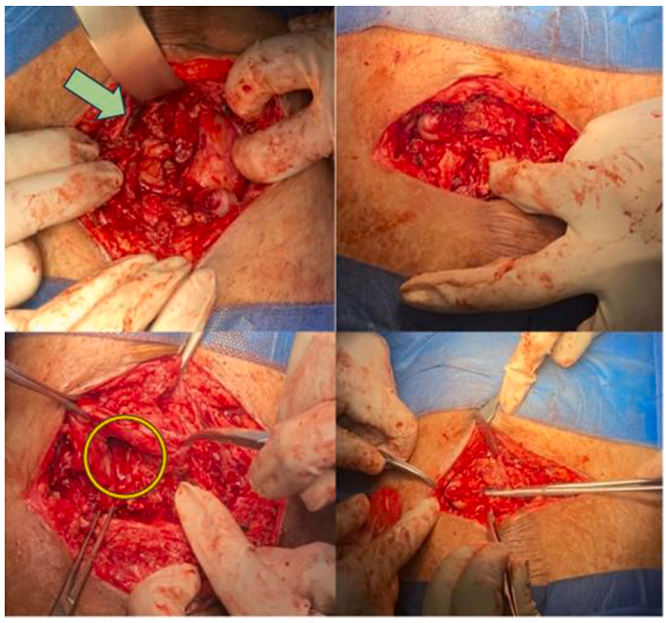

Fig. 3. Open surgical was performed with general anaesthesia. The incision was made at the previous surgical site. Clot was detected in the intraoperative (Green arrow) and the bladder defect was identified (Yellow circle). (For interpretation of the references to colour in this figure legend, the reader is referred to the Web version of this article.)

urinary output or increased serum creatinine mimicking acute renal failure.[1,4] The presentation time in the previously reported cases ranged from six days to eleven days after CD.[4,5] In this case, abdominal pain was the patient's first complaint on day three after CD, accompanied by gross hematuria on day six after CD. The patient also experienced anemia, ascites, and acute renal failure, consistent with the clinical features of the delayed presentation of IBT. Risk factor in this case was the severe adhesion caused by laparotomy appendectomy several years ago. While other risk factors were not found.

With an accuracy of 85–100%, retrograde cystography is the standard imaging technique for diagnosing bladder trauma.[6] False-negative results, however, can happen if the bladder is not sufficiently distended or if there is a small bladder perforation. Computed tomography cystography has 90–95% sensitivity and 100% specificity for diagnosing bladder trauma.[6] In their earlier reports, Tai C. K. et al. and Aghaways I. et al. described small bladder perforations (<1 cm) and proposed that the mechanism underlying these perforations was either retraction during bladder separation from the lower segment of the uterus or a partial mural tear caused by diathermy.[4,5] Retrograde cystography did not show bladder perforation in the case report by Tai C K et al., but CT cystography detected a small perforation in the dome.[1,4] We hypothesized that, in our case, the bladder perforation was initially sealed off by the enlarged uterus postpartum, resulting in no symptoms in the early phase. However with uterine involution rate of 0.95–1.6 cm, urine extravasation began to occur at day three dan symptoms began to develop. Amidst the perforation being 8 cm long, retrograde cystography and CT urography failed to detect the bladder defect in our case. These false-negative findings were believed to have been the result of direct pressure from the large hematoma and enlarged uterus to the bladder defect, resulting in no contrast extravasation observed on both retrograde cystography and CT urography. From our finding, our case is the largest bladder perforation in delayed IBT cases.

Iatrogenic bladder trauma treatment is divided into conservative and surgical management.[1,4,5] The bladder trauma associated with obstetric operations generally tends to be large and accompanied by a large hematoma as well as concomitant ureteral injury; thus, a comprehensive and detailed evaluation should also be done to assess the possibility of

injury to the ureter, especially the lower segment ureter. An open approach is a more suitable technique to repair the trauma to the bladder due to obstetric operations, and if a concomitant ureteral injury is present, it should also be repaired immediately.[4] In contrast, the perforation of the bladder caused by endourological instruments is usually small and located near the accessible dome of the bladder; therefore, we can also consider the laparoscopic approach.[4] Two important points to take care of after stitching the defect are to check if there is still an area of leakage by distending the bladder with saline, and the aspiration of extravasated urine should be done as much as possible before the end of the operation.

3. Conclusions

Delayed presentation of IBT is uncommon in clinical practice. Clinicans should familiarize themselves with the features of delayed presentation of IBT for timely diagnosis and treatment to prevent further morbidity.

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Ethical approval

This study is approved by The Ethics Committee of the Faculty of Medicine, University of Indonesia – Cipto Mangunkusumo Hospital with approval number KET-1147/UN2.F1/ETIK/PPM.00.02/2022. Written informed consent was obtained from the patient for publication of this case report and any accompanying images.

CRediT authorship contribution statement

Ficky: Writing – original draft, Software, Resources, Methodology, Investigation, Data curation, Conceptualization, Writing – original draft, Software, Resources, Methodology, Investigation, Data curation, Conceptualization. **Irfan Wahyudi:** Writing – review & editing, Validation, Supervision, Resources, Project administration, Funding acquisition, Conceptualization. **Fina Widia:** Writing – review & editing, Validation, Supervision, Conceptualization. **Gampo Alam Irdam:** Writing – review & editing, Validation, Supervision, Resources, Conceptualization.

Declaration of competing interest

None.

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