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**Case Study**

# Post Caesarean Urinary Retention Due to Undiagnosed Extra Peritoneal Bladder Injury

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**Abstract:** Post caesarean urinary retention is not an uncommon incident. But an undiagnosed extra peritoneal bladder injury present with acute urinary retention is uncommon. This is a case of undiagnosed intra operative, extra peritoneal bladder injury presented as post caesarean urinary retention due to communication of bladder with extra peritoneal space through the extra peritoneal bladder wall defect.
**Keywords:** Extra peritoneal, caesarean, cystoscopy.

## Introduction

Capacity of the urinary bladder continuously increases throughout the pregnancy starting from the third month and lasting up to the end of post-partum period[1]. Hypotonic status of the bladder persists even after the effect of the gravid uterus stops after the delivery which increases the susceptibility for post-partum urinary retention (PUR). Awareness about the PUR, early detection and immediate proper management are important to prevent irreversible damage to the bladder structures[2]. Painful, palpable, or percussable bladder, when the patient is unable to pass any urine with the full bladder is generally defined as acute urinary retention by the International Continence Society and International Urogynecological Association[3]. PUR can be classified into covert and overt retention[4]. Covert urinary retention is characterized by elevated post voided residual bladder volume (PVRBV) which is not usually clinically manifest. But in the overt acute urinary retention, patient is unable to void spontaneously. PVRBV more than 150ml is generally considered as the cut-off in most of the studies[5].

Incidence of PUR after a vaginal delivery is ranging from 1.7% to 17% which indicates its relatively high prevalence[6, 7]. Predisposing factors for PUR after vaginal delivery are primi parity, prolonged labour, instrumental delivery, epidural analgesia and perineal injury[8]. Even though an experimental study demonstrated a relationship of the PUR after vaginal delivery with plasma progesterone level change and the expression of caveolin, caveolae, and nerve growth factor in bladder muscle cells, the exact pathophysiological mechanism is not understood[9]. Even though the relationship between caesarean delivery and PUR is inconclusive, previous studies suggested that prevalence of PUR is higher after caesarean delivery[10]. Factors which may contribute are regional anaesthesia, emergency caesarean section, prolonged surgery, caesarean in second stage of labour or following failed instrumental delivery, post-operative immobility and wound pain.

Incidence of bladder injury during caesarean is not so rare due to the close proximity of bladder and the uterus. This incidence is higher in repeat caesarean (0.6%) compare to primary caesarean section (0.2%)[11]. Morbid adherent placenta (acreta, increta and percreta), which is a complication of past caesarean sections increases the risk of intra operative bladder injury up to 11.7% and hence becoming a challenge to obstetricians due to wider applications of caesarean deliveries in modern obstetrics practice[12].

Other conditions which increases the intraoperative bladder injury are[13]

1) Pregnancies with past uterine scar like caesarean, myomectomy or rupture (more than 3 caesarean sections carries five times higher chance of bladder injury).
2) Prolonged or obstructed labour with bladder distention.

3) Intra-abdominal adhesions due to past surgeries, PID, endometriosis, radiotherapy.
4) Distorted local anatomy due to congenital (uterine anomalies) or acquired causes (fibroids).
5) Emergency caesarean section (31% in emergency caesarean section vs 11% in elective caesarean).
6) Caesarean delivery in advanced labour.
7) Caesarean hysterectomy (lead to 1-4% of caesarean bladder injury).

Features suggestive of intra-operative bladder injury are
1) Presence of urine in the operative field.
2) Transurethral Foley's catheter bulb visualized in the operative field.
3) Haematuria.

Any suspicious intra operative bladder injury should be confirmed before the abdominal wall closure by filling the bladder with diluted methylene blue through the transurethral catheter.

Intra operative bladder injury can be classified in to five grades[14].

**Grade 1:** Contusion, intramural hematoma or partial thickness laceration.
**Grade 2:** Extra peritoneal bladder wall laceration <2 cm.
**Grade 3:** Extra peritoneal >2 cm or intraperitoneal <2 cm laceration.
**Grade 4:** Intraperitoneal bladder wall laceration >2 cm.
**Grade 5:** Intra-or extra peritoneal bladder wall laceration involving the trigone or bladder neck.

Intra operative detection and immediate and proper repairing always minimize long term complications except in some cases of morbid adherent placenta with intractable bleeding, which need delayed suturing 24 to 48 hours later[15, 16]. Expert help should be sought in cases of involvement of trigone or grade 5 injuries. Repairing can be done with No 3.0 Polyglycolic acid suture in two layers with simple continuous technique[17]. Indwelling urethral catheter should be kept in situ for 10 to 14 days to allow free drainage of urine until the bladder heal[18]. Proper patient counselling and documentation are important in each of these steps.

**Case history**
30 year old mother of one child underwent repeat elective caesarean section under spinal anaesthesia at term. Surgery was uneventful and patient was discharged after 24 hours from the surgery. After six hours from the surgery, her catheter had been removed and she had passed urine spontaneously. She re-admitted on next day with acute urinary retention and severe left lower abdominal pain. On examination she was afebrile and had distended tender lower abdomen which suggestive of distended bladder.

Immediate indwelling urethral catheter was inserted which drained 1400ml of urine and her pain was settled. Her inflammatory markers were in normal range and urinalysis was normal except the presence of occasional red cells.

After 48 hours her catheter was removed and she spontaneously passed 300ml of urine. But she complained left side lower abdominal pain again which spread towards the left costal margin during micturition. She underwent ultra sound scan to check the PVRBV which revealed 600ml of PVRBV and elongated sausage shape cystic lesion in the left anterior abdominal wall between rectus abdominis muscle and parietal peritoneum (Figure 1). This lesion directly communicated with the bladder in the mid line of the body. Echogenic pattern of the fluid in this lesion was similar to the urine in the bladder.

Other than that she had significant probe tenderness over this lesion. There was no free fluid in the Pouch of Douglas. Rest of the pelvic organs appears normal for the immediate post-partum period. She was immediately re-catheterized and drained 800ml of urine. Repeat transabdominal scan didn't show that anterior abdominal wall cystic lesion after catheterization and thus raised the suspicion of having extra peritoneal bladder injury.

She was immediately underwent diagnostic cystoscopy and confirmed the presence of anterior bladder wall injury (approximately 5mm) which opened in to extra peritoneal space. After multi-disciplinary team meeting, decision was taken to keep the indwelling catheter for 3 weeks with antibiotics.

Repeat cystoscopy after 3 weeks confirmed the well healed bladder and she spontaneously passed urine after catheter removal. Her PVRBV was 60ml. Her abdominal pain also settled.

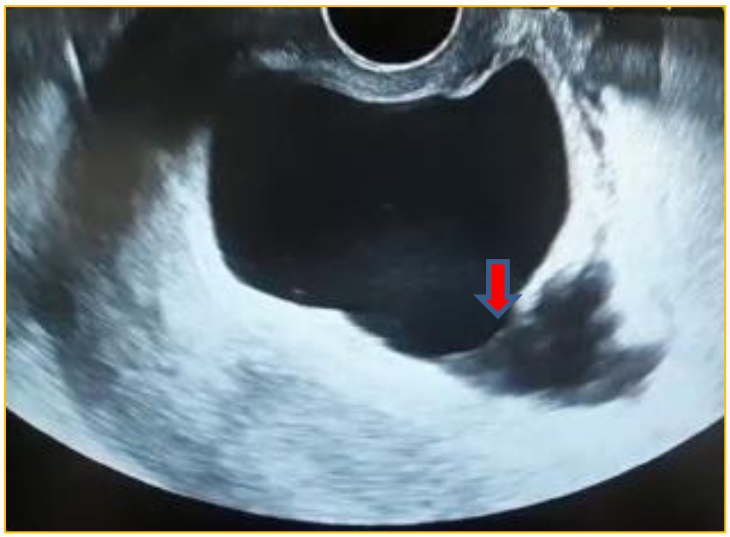

**Figure 1: Ultra sound scan view of the filled bladder which communicates with the anterior abdominal wall cystic lesion through the extra peritoneal defect (arrowed).**

**Discussion**

As repeat elective caesarean section itself is a risk factor for intra-operative bladder injury, all the measures should be taken to minimize the risk. Using sharp dissection is advocated instead of blind dissection with a piece of gauze in the cases which adhesions is anticipated[19]. This will allow the surgeon to do the bladder repairing easily and cleanly, in case of a bladder injury as the cut edges are not crushed. Trying to entering in to the peritoneal cavity as high as possible from the level of pubic symphysis will further reduce the risk of bladder injuries at the time of entry into the peritoneal cavity. Meticulous hemostasis from the time of skin incision up to the entry into the peritoneal cavity will allow the surgeon to see the each layer that is being cut and thus reduce the risk of bladder injury.

Unlike an intra-peritoneal bladder injury, extra peritoneal bladder injury is not easily detected as it opens into a potential space (retro-pubic space). So the intra operative detection rate is low. As surgeon has sutured the parietal peritoneum during abdominal wall closure, leaking urine through the injury site after catheter removal cannot be entered into the peritoneal cavity. So once her detrusor starts to contract, urine had leek into the extra peritoneal space and traveled along the space between parietal peritoneum and rectus abdominis muscles in the left side, which lead to her left sided abdominal pain during micturition. As this potential space gradually increase with the each micturition attempt, it expand up to a level which accommodate large amount urine that detected by ultrasonography as a cystic lesion in the anterior abdominal wall which communicates with the bladder. That is why she ended up with an acute urinary retention by next day. If this urine leak into peritoneal cavity, diagnostic dilemma could have occur as absent urine output with free fluid in the ultrasonography raise the suspicion of intra peritoneal bleeding. But if so, her recovery after the surgery will not be fast as in this case as leaking urine into the peritoneal cavity cause significant abdominal pain due to the peritoneal irritation.

Acute urinary retention after caesarean section should be managed with immediate catheterization and measurement of initially drained urine. As it was more than one liter in this case catheter could have been kept for longer period to rest the over distended detrusor muscles. But it increases the risk of urinary tract infections. Prophylactic anti-biotic may be used to cover this period. If the catheter could have been kept for at least 10 to 14 days, it could have helped to heal the bladder as well. If the facilities are permitted, any women presented with acute urinary retention during immediate postpartum period should be gone through an ultra sound scan of the abdomen and pelvis to detect any free fluid in the peritoneal cavity or fluid collection in the extra peritoneal space. This may help to prevent the delay in diagnosing a bladder injury. If there is any suspicion, CT- IVU (computerized tomographic intravenous urogram) or cystoscopy can be done to confirm the bladder injury locate the site of the injury.

After diagnosing the bladder injury, surgical repairing or conservative management can be done depending the site and size of the bladder injury. As it was a small injury and opened into the extra peritoneal space, this can be easily managed with catheterization for 2 to 3 weeks with or without antibiotics. Confirmation of proper healing should be confirmed with CT-IVU or cystoscopy. Bladder sensation should be checked before the removal of catheter and PVRBV should be checked.

**Conclusion**

Undiagnosed extra peritoneal bladder injuries during caesarean sections can be present with atypical ways which warrant good history, examination, and investigations to confirm the diagnosis and plan the definitive management to minimize the long term morbidity of the patient.

**Declarations**

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**Author contribution:** The author confirms sole responsibility for study conception and design, data collection, analysis and interpretation of results, and manuscript preparation.

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