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Concurrent sealed off gallbladder perforation with small bowel obstruction in the third trimester of uncomplicated pregnancy: A rare case report

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Abstract

Background: Pregnancy-related acute gallbladder perforation with small bowel obstruction is exceptionally rare surgical emergency, its nonspecific symptoms may be misattributed to physiological changes of pregnancy, leading to diagnostic delay.

Case presentation: A 28-year-old primigravida at 30 weeks' gestation presented with progressive abdominal pain that was initially attributed to pregnancy-related discomfort, resulting in delayed referral to the surgical service. Abdominal ultrasound followed by MRI Abdomen demonstrated a sealed-off gallbladder perforation with concomitant small bowel obstruction. Patient underwent emergency caesarean section with exploratory laparotomy. Intraoperatively, gangrenous gallbladder with inflammatory stricture at the jejuno-ileal junction with dense omental adhesions were identified, cholecystectomy with adhesiolysis was performed. Postoperatively, ERCP with bile duct stenting was required to treat a minor bile leak from the cystic duct stump secondary to sloughing, after which the maternal postoperative course was uneventful; however, preterm neonatal mortality occurred.

Conclusion: This case highlights the importance of maintaining a high index of suspicion for acute biliary and intestinal pathology in pregnant patients with atypical or persistent abdominal pain, especially in the third trimester. It underscores the critical role of timely multidisciplinary management, even when fetal prognosis may remain guarded in the context of advanced gestation and severe maternal disease.

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Introduction

About 1 in 1,600 to 1 in 10,000 pregnancies result in acute cholecystitis, which is the second most frequent no obstetric surgical indication during pregnancy [1]. However, with an estimated extremely low prevalence in pregnant patients, spontaneous gallbladder perforation is a serious consequence [2,3]. Very few cases of sealed-off gallbladder perforation and small intestinal blockage occurring simultaneously in the third trimester have been documented in the international literature [2]. The organ ruptures due to increasing inflammation, wall necrosis, and tissue loss that cause gallbladder perforation. Due to hormonal impacts on biliary dynamics during pregnancy, risk factors include prolonged bile stasis, cystic duct obstruction, and acute cholecystitis from cholelithiasis [4].

Pregnancy-related modifications to bile composition, gallbladder contractility, and increased However, with an

estimated prevalence of only 0.001-0.02% in pregnant patients, spontaneous gallbladder perforation is a serious consequence [2,3]. Very few cases of sealed-off gallbladder perforation and small intestinal blockage occurring simultaneously in the third trimester have been documented in the international literature [2].

The concurrent presentation with small bowel obstruction in an uncomplicated primigravida at 30 weeks represents an unusual and complex surgical challenge, management, and outcomes of this rare and acute surgical combined pathology [5].

Case presentation

A 28-year-old primigravida at 30 weeks of gestation presented with a 7-day history of progressive abdominal pain. The patient had no significant past medical history, no previous abdominal surgery, and an uncomplicated antenatal course until the onset of symptoms. She had no known drug allergies and was not on any chronic medications. The patient presented to the obstetric department with a chief complaint of abdominal pain of 7 days duration. The pain was diffuse, non-radiating, and progressive in nature. Associated symptoms included mild nausea and general malaise. Physical examination revealed a gravid uterus with mild tenderness over the right upper quadrant. Vital signs were stable with heart rate 92 bpm, blood pressure 128/84 mmHg, and temperature 37.2°C. Obstetric examination showed no signs of preterm labor or fetal distress on cardiotocography. The clinical presentation was initially attributed to pregnancy-related discomfort, and the patient was managed conservatively with analgesics and antiemetics for 2 days. However, the symptoms failed to resolve, and the patient continued to report worsening pain. Given the persistent and worsening symptoms despite 2 days of conservative management, the patient was referred to the surgical department for evaluation. On surgical examination, the patient had definite right upper quadrant tenderness with a positive Murphy's sign, highly suggestive of acute cholecystitis. Vital signs showed mild tachycardia (heart rate 102 bpm) and low-grade fever (38.1°C). The abdomen was soft but tender, with guarding over the right hypochondrium. No peritoneal signs were apparent at this stage. Given the clinical suspicion of acute cholecystitis and the possibility of complications, advanced imaging was pursued. MRI abdomen was performed to evaluate the biliary system and rule out pregnancy-related mimics of acute surgical pathology. On the day following MRI imaging, the patient developed obstipation (complete absence of stool and flatus) accompanied by progressive abdominal distention and increased pain. These new symptoms raised concern for bowel obstruction and prompted urgent Investigation. An erect abdominal X-ray was obtained, which revealed classic radiological signs of small bowel obstruction: multiple dilated small bowel loops with air-fluid levels consistent with bowel obstruction. MRI of the abdomen performed on day 3 of admission revealed: Gallbladder: A markedly enlarged, distended gallbladder measuring approximately 6.5×4.2 cm with wall thickening (approximately 4 mm). Focal area of perforation at the gallbladder fundus with contained rupture and formation of a pericholecystic collection (sealed-off perforation). Multiple echogenic foci within the gallbladder lumen consistent with cholelithiasis. Small Bowel: Dilated jejunal loops (maximum diameter 4.8 cm) with transition point suggestive of mechanical obstruction. Peritoneal free fluid in small quantities. Peritoneal Cavity:

Small loculated collection adjacent to the gallbladder fossa, consistent with walled-off perforation. No evidence of frank peritonitis or massive ascites.

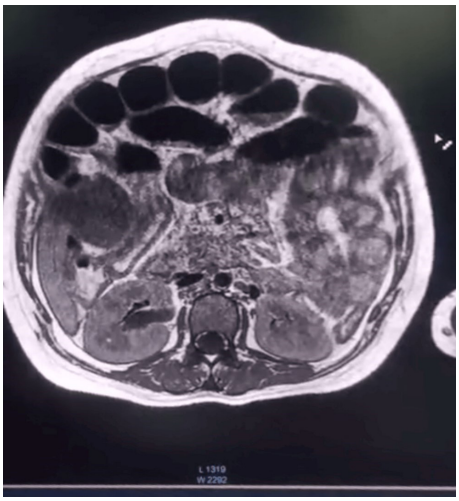

Figure 1: GB Perforation withcontained rupture and thickened Gb wall. GB: Gallbladder

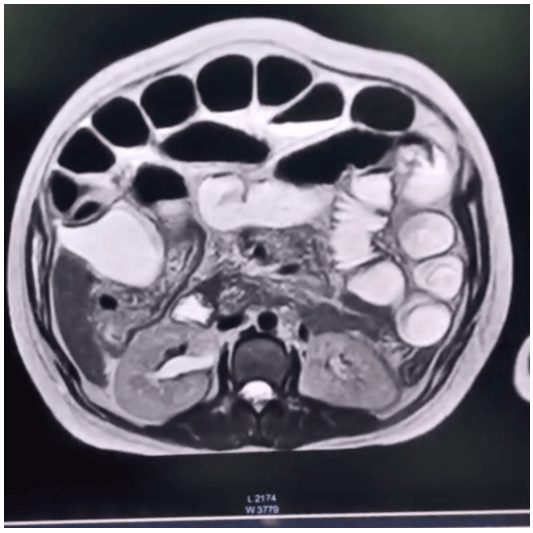

Figure 2: String of Pearls appearance of bowel characteristic of SBO. SBO: Small Bowel Obstruction.

Patient was taken up for Cesarean section and exploratory laparotomy with intraop findings

Figure 3: On exploratory laparotomy sealed off Gall bladder perforation with gangrenous Gallbladder.

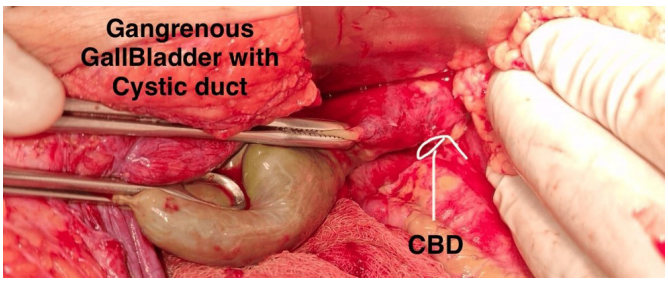

Figure 4: Complete Gangrene of Gallbladder with cystic duct insertion into CBD (Common Bile Duct).

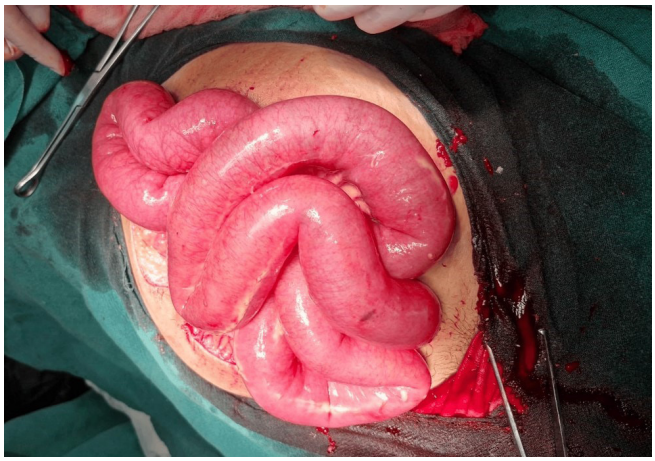

Figure 5: Dilated proximal jenunal loops indicating distal bowel obstruction.

Exploratory laparotomy and surgical findings

Following delivery of the fetus and placenta, exploration of the abdominal cavity revealed:

Small bowel loops: Multiple dilated jejunal and ileal loops filled with gas and intestinal fluid. Maximum diameter approximately 5.2 cm in the proximal jejunum with progressive narrowing toward the distal small bowel. Adhesions: Dense fibrous adhesive bands involving the jejunum, with adhesions creating a constricting band around a segment of midjejunum causing mechanical obstruction. The adhesions were thick, mature, and adherent to the visceral peritoneum.

Gallbladder: Markedly distended gallbladder (approximately 7×5 cm) with thinned, edematous, friable wall showing early gangrenous changes (green-purple discoloration of the serosal surface indicating ischemic necrosis). A focal full-thickness perforation approximately 0.8 cm in diameter was identified at the fundus with a contained walled-off collection of loculated bile and inflammatory material (peritonitis contained by the omentum and adjacent viscera).

Peritoneal fluid: Approximately 200-250 mL of serofibrinous exudate consistent with contained peritonitis.

Biliary system: No stone impaction in the cystic duct noted (suggesting stone passed or primary perforation); common bile duct appeared patent on gross examination. Operative Interventions - Following adhesiolysis and relief of the obstruction, the small bowel loops were carefully inspected for viability: Color: Pink to normal reddish-purple. Bleeding from the cut mesentery: Brisk and normal, Peristalsis: Gentle passage of a hand along the bowel showed normal peristaltic activity returning No areas of gangrene or transmural infarction identified Given the adequate perfusion and viability of the small bowel, no bowel resection was deemed necessary. The bowel loops were gradually decompressed by gentle milking of the contents toward the cecum. Total cholecystectomy was performed due to the perforation and gangrenous changes, the gallbladder fossa was inspected; no additional stones in the common bile duct were evident. The specimen (perforated gallbladder with contained exudate) was placed in a specimen bag and removed. Peritoneal Lavage and Drainage was performed. A drain (28 Fr corrugated rubber drain) was placed in the gallbladder fossa. Abdominal Wall Closure was done. During Post operative period on Day Patient developed bile leak and Sloughing of cystic duct stump was suspected and confirmed on ERCP and Bile duct stunting was performed and Bile leak was successfully managed and patient was discharged on POD 7. Neonate mortality was reported on Day 2 of life with cause of death identified as Acute Respiratory Distress Syndrome.

Discussion

Case represents an exceptionally rare and clinically challenging presentation combining three significant surgical pathologies: gallbladder perforation during pregnancy, concurrent small bowel obstruction, and occurrence in the third trimester of gestation. Gallbladder perforation during pregnancy is an extraordinarily uncommon complication, occurring in only 0.001-0.02% of pregnancies, with mortality rates ranging from 12% to 42% when perforation does occur [4,6]. The combination of gallbladder perforation with simultaneous small bowel obstruction in the third trimester has an estimated incidence of less than 0.001% of pregnancies, making this a remarkably rare scenario with limited representation in medical literature [7]. Pregnancy-Related Changes in Biliary Physiology -

Altered bile composition: Pregnancy is associated with increased cholesterol saturation of bile, decreased chenodeoxycholic acid, and increased lithogenic index. These changes create a “hyperlithogenic state” predisposing to stone formation and stasis.

Gallbladder dysfunction: Gallbladder contractility decreases during pregnancy, particularly in the third trimester, leading to increased fasting volume and residual volume of bile. This stasis promotes stone formation and retention.

Hormonal factors: Elevated estrogen increases cholesterol secretion into bile, while progesterone decreases gallbladder contractility-both promoting lithogenic changes.

Hemodynamic changes: Increased blood volume and cardiac output, combined with splanchnic vasodilation, may predispose to venous stasis in the gallbladder wall, contributing ischemia [8]. The pathophysiology of gallbladder perforation involves progressive inflammation leading to transmural necrosis of the gallbladder wall. In cases of acute cholecystitis, continued biliary obstruction and inflammation result in ischemic necrosis of the mucosa and muscular layers, ultimately culminating in perforation [9]. The diagnosis of acute surgical pathology during pregnancy presents multifaceted challenges that significantly impede clinical recognition and appropriate management, the obstetric team’s initial attribution of abdominal pain to pregnancy-related discomfort is not uncommon, as: Abdominal pain occurs in 30-35% of normal pregnancies, Right upper quadrant pain is frequently attributed to physiologic cholestasis of pregnancy, Nausea and abdominal pain are expected in the third trimester [10].

Pregnant patients are traditionally considered "low-risk" for acute surgical pathology [11]. Magnetic Resonance Imaging (MRI) has emerged as the preferred imaging modality for evaluating abdominal pathology in pregnancy due to several inherent advantages: the absence of ionizing radiation, excellent soft tissue contrast without fetal exposure to contrast agents, multiplanar imaging capabilities, and superior visualization of fluid collections and biliary pathology compared to ultrasound [12]. The management of acute surgical emergencies in viable third-trimester pregnancies requires careful consideration of maternal health status, fetal viability and maturity, urgency of the surgical condition, and optimal timing and mode of surgical intervention [13]. Multidisciplinary Approach: Joint decision-making between obstetrics, general surgery, and anesthesia is essential. In this case: Obstetric team confirmed fetal viability and well-being Surgical team made operative urgency assessment, Anesthetic team planned for pregnant patient with acute surgery [14].

Decisive surgical intervention: Delaying surgery for perceived fetal benefit is counterproductive. In this case: The perforated, gangrenous gallbladder posed an ongoing source of sepsis SBO carried high risks of bowel necrosis and maternal death, Early definitive surgical treatment was life-saving - Combined Cesarean Delivery with Emergency Surgery [15].

Performing cesarean section concurrently with emergency laparotomy is justified when: Emergency surgery is unavoidable (as here), Surgery requires extensive abdominal exploration (better done without the gravid uterus), Protects the fetus from ongoing contamination and sepsis, allows aggressive surgical management without fetal compromise Reduces total operative time and anesthetic exposure.

Conclusion

This case report documents an exceptionally rare presentation of sealed-off gallbladder perforation complicated by small bowel obstruction in the third trimester of pregnancy. With an estimated extremely low incidence in pregnancies, this combined pathology represents one of the rarest surgical emergencies in obstetric practice.

The case emphasizes several critical clinical principles: Diagnostic Vigilance, Imaging Excellence: MRI is a powerful diagnostic tool in pregnancy that should be used liberally to evaluate acute abdominal symptoms. Multidisciplinary Management: Close collaboration between obstetrics, general surgery, and anesthesia is essential for optimal outcomes. Decisive Treatment: Timely surgical intervention in cases of perforated viscera is life-saving, regardless of pregnancy status or trimester. Combined Procedures When Indicated: Cesarean delivery combined with emergency laparotomy is justified and beneficial in appropriate cases. The successful management of this rare and life-threatening condition demonstrates that with proper diagnostic approach, multidisciplinary collaboration, and decisive surgical intervention, excellent outcomes are achievable even in the most challenging circumstances.

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