International Journal of Reproduction, Contraception, Obstetrics and Gynecology
Devapriya K et al. Int J Reprod Contracept Obstet Gynecol. 2026 Jan;15(1):356-360
www.ijrcog.org
pISSN 2320-1770 | eISSN 2320-1789

DOI: https://dx.doi.org/10.18203/2320-1770.ijrcog20254313

Case Report

Navigating gallstones in pregnancy: a case of surgical precision and obstetric vigilance

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Received: 22 November 2025
Accepted: 16 December 2025

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ABSTRACT

Gallstone disease during pregnancy poses clinical challenges due to altered physiology and concerns over fetal safety. We present the case of a 28-year-old primigravida who had undergone endoscopic retrograde cholangiopancreatography (ERCP) with biliary stenting for choledocholithiasis prior to conception. She remained asymptomatic during early pregnancy, with normal liver function and no signs of cholecystitis on magnetic resonance cholangiopancreatography (MRCP). After multidisciplinary evaluation, laparoscopic cholecystectomy was performed during the second trimester using fetal-safe anaesthetic techniques and open abdominal access. The procedure was uneventful, and recovery was smooth. She later delivered a healthy term infant via spontaneous vaginal delivery at 37 weeks. This case supports the growing evidence that laparoscopic cholecystectomy, when carefully timed and executed, is a safe and effective treatment for gallstone disease in pregnancy.

Keywords: Gallstones, Pregnancy, ERCP, Laparoscopic Cholecystectomy, Biliary stenting

INTRODUCTION

Biliary tract disease is the second most common general surgical condition encountered in obstetric patients after appendicectomy.[1,2] When surgery is indicated in pregnant patients with gallbladder disease, laparoscopic cholecystectomy is considered a safe and effective option for both the mother and the fetus.[2] The second trimester is traditionally considered the optimal time for operative procedures during pregnancy, as organogenesis is complete and the risk of spontaneous abortion is lower than in the first trimester.[2,3]

In contrast, procedures performed during the third trimester have been historically associated with a higher risk of preterm labor.[2] There is no evidence to support the routine use of prophylactic tocolytics in pregnant patients undergoing laparoscopic cholecystectomy; however, tocolytics may be administered in cases where premature uterine contractions develop postoperatively.[1,4]

CASE REPORT

A 28-year-old primigravida at 7 weeks of gestation presented to the obstetrics and gynaecology OPD for her first antenatal check-up. Three months prior, in a non-pregnant state, she had experienced an episode of acute abdominal pain localized to the right upper quadrant. She was referred to department of medical gastroenterology from a local hospital. The pain was intermittent, colicky in nature, typically occurring after fatty meals, and had worsened over the previous two days. She also reported multiple episodes of low-grade fever during that period. She denied any history of nausea, vomiting, diaphoresis, pruritus, or yellowish discoloration of urine or stool. Her past medical and surgical history was unremarkable. She was a non-smoker and did not consume alcohol. There was no history of medication use or drug allergies.

On physical examination, she was 158 cm tall, weighed 64 kg, and had a BMI of 25.64 kg/m². She appeared

uncomfortable due to pain but was afebrile and anicteric. Initial liver function tests were deranged with a total bilirubin of 4.1 mg/dL, direct bilirubin of 1.7 mg/dL, SGOT 399 U/L, SGPT 560 U/L, and ALP 673 U/L. Ultrasound abdomen revealed a distended gallbladder containing multiple calculi measuring approximately 4 mm, along with a dilated common bile duct (CBD) measuring 9 mm. Calculi were visualized in the distal CBD, suggestive of cholelithiasis with choledocholithiasis.

She subsequently underwent ERCP, which revealed a dilated CBD with filling defects in the mid and distal CBD. Selective CBD cannulation was achieved without difficulty. Balloon sweep retrieved multiple yellow cholesterol stones. An occlusion cholangiogram confirmed complete stone clearance. A 7 Fr × 7 cm double pigtail stent was placed into the left hepatic duct, draining yellow bile. The procedures performed included ERCP, biliary sphincterotomy, CBD clearance, and left hepatic duct stenting (Figure 1). She was kept under regular follow-up, and liver function tests normalized. She was advised to undergo cholecystectomy with stent removal within three months, but she did not return for the procedure.

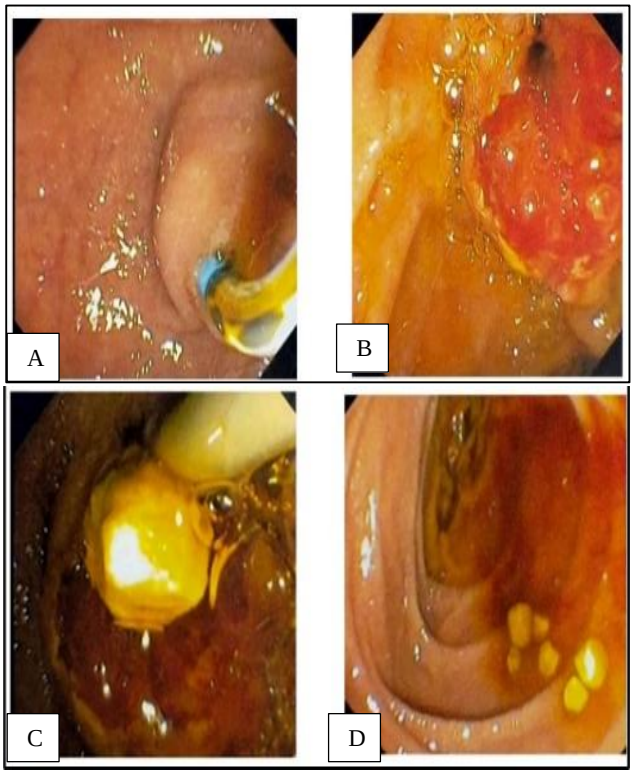

Figure 1 (A-D): ERC + biliary sphincterotomy + CBD clearance + left hepatic duct stenting.

At seven weeks of gestation, with the stent in situ, she was asymptomatic, and liver function tests remained normal. She had no complaints of nausea or vomiting. All routine antenatal blood and urine investigations were within normal limits. A dating scan performed at 8 weeks confirmed a viable intrauterine pregnancy corresponding to gestational age. She was referred to the department of surgical gastroenterology, where she was counselled regarding the need for elective cholecystectomy, preferably during the second trimester.

Her first trimester remained uneventful. Preoperative evaluation with MRCP was done to avoid radiation exposure and revealed cholelithiasis without features of cholecystitis. The gallbladder appeared distended with multiple T2 hypointense signal filling defects, the largest measuring 0.6 × 0.4 cm, suggestive of gallstones.

Following detailed counselling regarding the potential risks of abortion and maternal-fetal complications related to surgery and anaesthesia, and after obtaining cardiopulmonary fitness clearance, she underwent laparoscopic cholecystectomy under general anaesthesia at 23 weeks of gestation. Short-acting anaesthetic agents were used to reduce fetal risk. Fetal heart rate was confirmed with a handheld Doppler before and after anaesthesia induction.

Abdominal access was obtained via an open (Hasson) technique at the umbilicus to minimize risk to the gravid uterus (Figure 2). Pneumoperitoneum was established, followed by the placement of 5 mm ports in the right subcostal and right subcostal midclavicular line, and a 10 mm port in the epigastric region. Dissection was performed above the R4U line. The gallbladder was separated from the liver bed using a harmonic scalpel and retrieved via the epigastric port using a bag technique. The gallbladder appeared distended, and cut section showed yellow cholesterol stones. The uterus was inspected intraoperatively and showed no signs of injury. The important steps and findings of the surgery were illustrated in Figures 2-9. Fetal heart activity was confirmed postoperatively using a handheld Doppler. Her postoperative course was uneventful, and she was discharged within 48 hours.

Figure 2: Placement of ports.

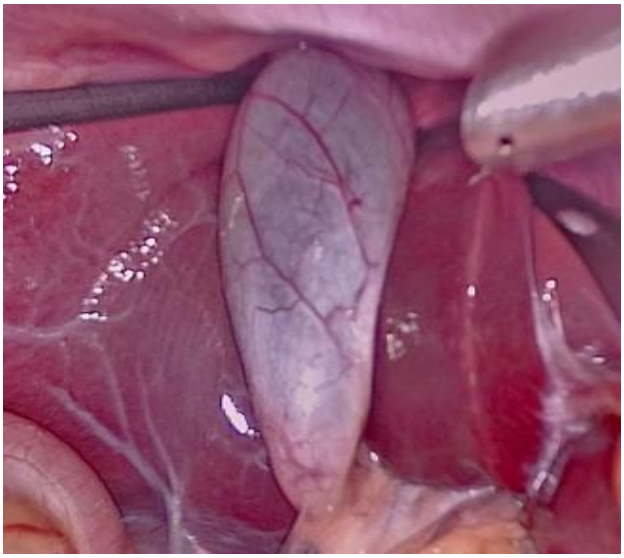

Figure 3: Visualising gall bladder.

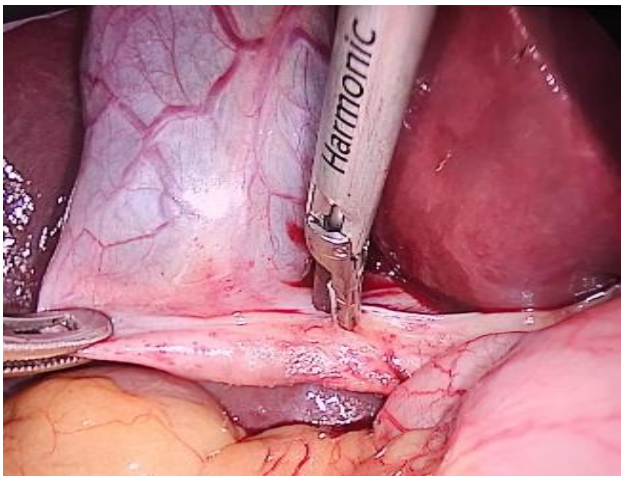

Figure 4: Gall bladder dissection.

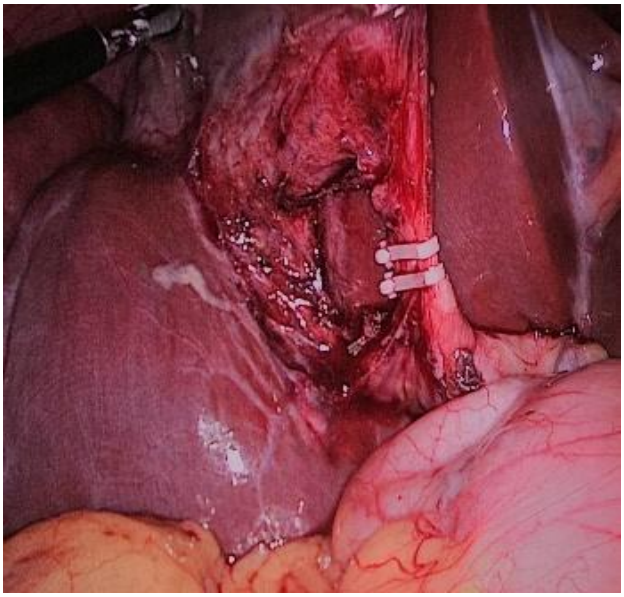

Figure 5: Clipping of cystic artery and duct.

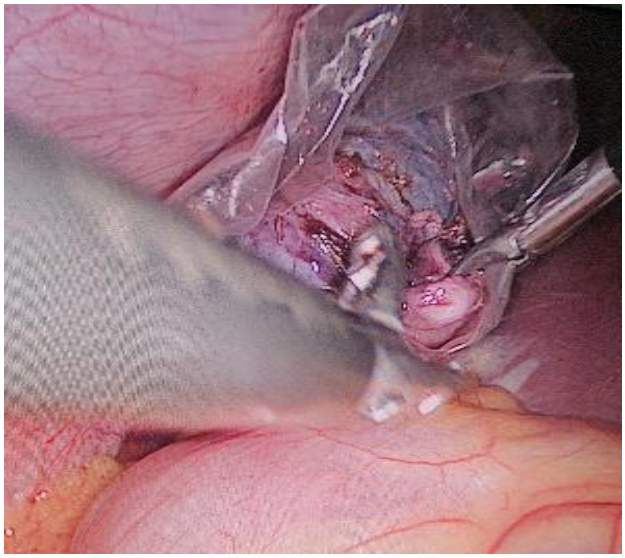

Figure 6: Gall Bladder removal.

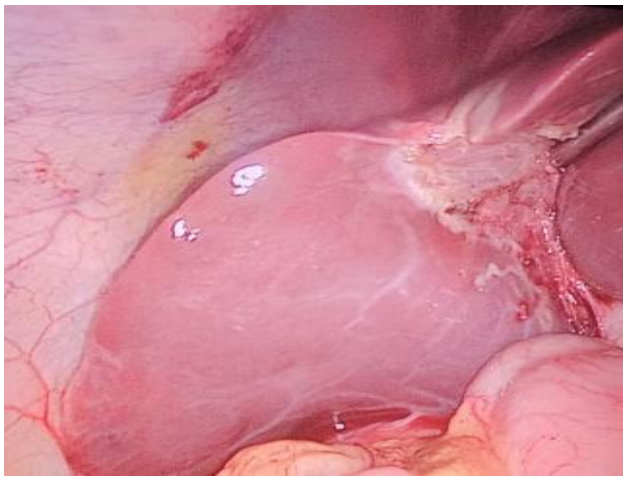

Figure 7: Inspection of surgical site.

Figure 8: Gravid Uterus.

Figure 9: Cholecystectomy specimen.

The remainder of the second and third trimesters progressed without complications. She was regularly monitored with blood investigations and fetal growth scans. At 37 weeks of gestation, she underwent normal vaginal delivery and gave birth to a term live female infant weighing 2.8 kg. The intrapartum and postpartum periods were uneventful. Postnatally, she was followed up regularly, and her recovery remained uneventful.

DISCUSSION

Cholelithiasis during pregnancy and the postpartum period has an incidence of approximately 12%, with pregnancy recognized as a significant risk factor for gallstone formation.[5] Gallbladder problems during pregnancy are commonly attributed to hormonal changes, particularly elevated levels of progesterone.[6] It has been postulated that pregnancy is associated with an increased percentage of colic acid, increased cholesterol secretion, increased bile acid pool size, decreased enterohepatic circulation, decreased percentage of chenodeoxycholic acid and increased bile stasis.[7]

Choledocholithiasis refers to the presence of gallstones within the CBD and can lead to serious complications such as obstructive jaundice, cholangitis, and pancreatitis, all of which may adversely affect both the mother and fetus.[5] Patients with symptomatic cholelithiasis often exhibit abnormal liver function tests.[5] Radiological evaluation in pregnant patients is similar to that in non-pregnant individuals, with ultrasound (US) and magnetic resonance cholangiopancreatography (MRCP) serving as the primary imaging modalities.[8] In addition to detailed assessment of the biliary system, MR imaging can help identify gallstone pancreatitis, pancreatic edema, and peripancreatic inflammatory changes.[5] Definitive management of complicated choledocholithiasis includes endoscopic sphincterotomy and stone extraction, followed by either index or interval cholecystectomy.[5]

Laparoscopic surgery during pregnancy poses unique challenges due to altered maternal anatomy and physiology, as well as potential impacts of general anaesthesia and carbon dioxide pneumoperitoneum on the maternal-fetal unit.[1,2] As pregnancy advances, the risk of injury to the gravid uterus increases, particularly during trocar insertion. To minimize this risk, the open (Hasson) technique is recommended for placement of the initial umbilical trocar, preferably at a supraumbilical site in advanced gestation.[2] Additionally, all subsequent trocars should be inserted under direct vision to further reduce the likelihood of uterine injury.[2]

The combination of ERCP and laparoscopic cholecystectomy provides a safe and effective option for definitive management of complicated gallstone disease and intractable pain during pregnancy, with sufficient access available for its implementation.[7] Morbidity rates range from 1% to 9%, and CBD injury rates from 0.2% to 0.7%, both largely influenced by the surgeon's experience.[1] Conversion rates range from 1.8% to 7.8%.[1] Specific complications include hemorrhage, bile leaks, retained stones, wound infections, and incisional hernias.[1] The favourable results across all trimesters indicate that laparoscopic cholecystectomy can be safely performed during pregnancy When compared to open cholecystectomy laparoscopic cholecystectomy carries a lower risk of miscarriage in early pregnancy and preterm labor in the later stages.[9] Nonetheless, the second trimester remains the optimal time for surgery. However, some case studies even demonstrate that laparoscopic cholecystectomy can be safely performed even in the third trimester of pregnancy, provided that standard surgical techniques are followed and port placement is carefully adjusted according to the size of the uterus.[10]

CONCLUSION

Laparoscopic cholecystectomy in the second trimester is a safe and effective treatment for symptomatic gallstones in pregnancy when conservative management fails or complications arise. Timely multidisciplinary care is essential to optimize maternal and fetal outcomes. ERCP is considered safe during pregnancy when clinically indicated and performed with fetal shielding. Preoperative imaging with MRCP helps avoid radiation exposure. Use of short-acting anaesthetic agents and open entry techniques helps reduce fetal risk.

Funding: No funding sources
Conflict of interest: None declared
Ethical approval: Not required

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Cite this article as: Devapriya K, Wills V. Navigating gallstones in pregnancy: a case of surgical precision and obstetric vigilance. Int J Reprod Contracept Obstet Gynecol 2026;15:356-60.