

ENDOSCOPIC RETROGRADE CHOLANGIOPANCREATOGRAPHY (ERCP) FOR SYMPTOMATIC CHOLEDOCHOLITHIASIS DURING PREGNANCY

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Cholelithiasis, although uncommon during pregnancy, is a challenging condition with serious potential complications for the mother and fetus. As the risk of fetal loss from surgery is high,^{1,2} surgeons defer, whenever possible, cholecystectomy and exploration of the common bile duct (CBD) until after delivery.^{3,4} Fetal exposure to ionizing radiation has been a concern and the reason for not performing endoscopic retrograde cholangiopancreatography (ERCP) during pregnancy in the past. Over the last few years, there were a few small series and case reports⁵⁻⁸ describing ERCP and endoscopic sphincterotomy (EST) for the management of choledocholithiasis during pregnancy. We describe the safe and effective use of ERCP and EST to remove symptomatic common bile duct stones in two pregnant women.

Patients and Methods

Two pregnant women were admitted to hospital because of repeated episodes of biliary pain, with evidence of obstructive jaundice by liver biochemical tests and abdominal ultrasound. In one patient, there was also evidence of biliary pancreatitis. The decision to perform ERCP was made after discussing the case with the attending surgeon and obstetrician. All possible measures to protect the fetus from radiation had been discussed and arranged with the radiologist. Both patients received prophylactic antibiotics intravenously. Conscious sedation with small doses of demerol and diazepam were administered intravenously. Patients underwent the procedure in the prone position. Measures were taken to protect the fetus from radiation, consisting of shielding the abdomen of the mother with a lead apron and limiting the radiation time to the minimum possible. Selective cannulation of the biliary duct could be achieved in both cases.

Case 1

A 25-year-old Saudi female, who was 16 weeks pregnant, presented to the emergency room with a two-week history of attacks of biliary pain, which became more severe on the day of presentation and was associated with nausea and vomiting. The urine color became dark one day prior to presentation. The physical examination was remarkable for mild scleral icterus and right upper quadrant (RUQ) abdominal tenderness. The biochemical tests of the liver were reported as follows: total bilirubin 49 μmol (normal <17), direct 42 (normal <7), AST 151 U/L (normal 15-37), ALT 239 U/L (normal 30-65), alkaline phosphatase 262 $\mu\text{mol/L}$ (normal 50-136) and gamma GT 140 U/L (normal 15-85). Serum amylase was normal. The abdominal ultrasound examination showed a distended gallbladder filled with stones, mildly dilated intrahepatic ducts and moderate dilation of the CBD (1.2 cm) with a stone in its distal part. Preparation, as mentioned earlier, was undertaken. ERCP with selective cannulation of the biliary system was performed and revealed a 0.5-cm stone in the distal end of the CBD. Subsequently, EST was performed and the stone was removed with a balloon catheter. Procedure time was short and the patient became asymptomatic soon after and within a few days all of the initially elevated biochemical tests became normal except for alkaline phosphatase, so she was discharged home. The patient delivered full-term healthy twins.

Case 2

A 30-year-old Saudi woman, who was 36 weeks pregnant, was admitted to the surgical department with a three-day history of repeated episodes of severe pain in the epigastrium and RUQ, which was associated with vomiting. The urine color became dark before admission. The physical examination revealed a mild scleral icterus and a moderately tender RUQ. The abnormal biochemical laboratory tests included: total bilirubin 43, AST 50, alkaline phosphatase 484 and serum amylase 282 U/L (normal <115). Abdominal ultrasound demonstrated a distended gallbladder with multiple small stones and sludge, dilated intra- and extrahepatic bile ducts, with the

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CBD measuring 18.0 mm and hyperechoic matter suggestive of a stone in the distal duct. The patient required several doses of demerol to relieve the severe pain. After taking the previously mentioned precautions, the patient underwent ERCP, cannulating and opacifying selectively the biliary system, which showed a stone of approximately 1 cm in diameter in the distal part of the CBD. Sphincterotomy was performed and the stone was removed. The patient experienced marked relief after the procedure and her complaints subsided. All abnormal biochemical tests except for alkaline phosphatase became normal after a few days, and the patient was discharged home symptom-free. The patient delivered a full-term healthy baby.

Discussion

Estrogens increase the lithogenicity of bile, and progesterone appears to impair the emptying function of the gallbladder, and this can explain the suspected increase of gallstone-related diseases during pregnancy.⁹ The clinical picture of gallstones in pregnancy does not differ from that in the nonpregnant women. Acute pancreatitis is rare during pregnancy and is associated with choledocholithiasis in up to 90% of cases.⁴ Cholecystectomy is second to appendectomy as nonobstetric/nongynecologic surgery during pregnancy,³ and about 11% of surgical emergencies during pregnancy were reported to be related to biliary pathology.¹⁰ The incidence of choledocholithiasis during pregnancy is believed to be between 2.5% and 4.2%.^{11,12} In one review, choledochus stones were found in 10% of pregnant women who underwent cholecystectomy.¹³ In another study, choledocholithiasis was found in 7% of pregnant women who presented with jaundice.¹⁴ Acute biliary pancreatitis and acute cholangitis are potentially serious complications of choledocholithiasis, which can be prevented or managed by removal of the ductal stones. The risk of fetal loss because of surgical procedures is high and the recommended surgical practice for symptomatic cholecystolithiasis-choledocholithiasis is to delay surgery whenever possible until after delivery. Although laparoscopic cholecystectomy (LC) has been performed safely for acute cholecystitis in pregnant women,¹⁵ the inability in most centers to perform laparoscopic exploration of the CBD for stone removal during LC limits its use currently in the management of choledocholithiasis. The introduction in the early 1970s of ERCP and EST has revolutionized the diagnosis and management of choledocholithiasis. Although limited, the published data over the last few years has documented the efficacy and

safety of ERCP and EST in the management of symptomatic choledocholithiasis during pregnancy. The most recent and largest series reported the experience at five centers.⁶ All measures to protect the fetus from radiation should be undertaken and those include the use of a lead apron to cover the abdomen of the pregnant women and to limit the radiation time to the minimum. Also recently, the fetus exposure to radiation was determined in a three-month pregnant patient who underwent ERCP and EST for removal of bile duct stone.⁷ The fluoroscopy time with a digital imaging system was four minutes, the fetal doses with a lead apron was 59 mrem. This amount was well within the radiation time considered to be safe for the fetus.¹⁶ We conclude, based on the published data and our reported cases, that ERCP and sphincterotomy appear to be effective and safe for removal of common bile duct stones during pregnancy.

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