Failed common bile duct cannulation during pregnancy: Rescue with endoscopic ultrasound guided rendezvous procedure

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ABSTRACT
Common bile duct (CBD) stones can lead to serious complications and require intervention with either endoscopic retrograde cholangiopancreatography (ERCP) or laparoscopic techniques for urgent relief. On an average 10%-20% of the patients with gall bladder stones can have associated CBD stones. CBD stones during pregnancy can be associated with hazardous complications for both the mother and the fetus. Failed cannulation while performing ERCP during pregnancy is a technically demanding situation, which requires immediate rescue with special techniques. Conventional rescue techniques may not be feasible and can be associated with hazardous consequences. Endoscopic ultrasound (EUS) guided rendezvous technique has now emerged as a safe alternative, and in one of our patients, this technique was successfully attempted. To the best of our knowledge, this is the first case report in the literature on EUS-guided rendezvous procedure during pregnancy.

Key words: Common bile duct stones, endoscopic retrograde cholangiopancreatography, pregnancy, rendezvous procedure

INTRODUCTION
The reported prevalence of common bile duct (CBD) stone in patients with symptomatic gallstones is between 10% and 20%[1,2] and the ductal stones can lead partial or complete biliary obstruction, cholangitis, hepatic abscesses or pancreatitis. It is, therefore, recommended that wherever patients may have symptoms if the investigations suggest CBD stones, extraction should be performed with either endoscopic retrograde cholangiopancreatography (ERCP) or laparoscopic techniques for urgent relief.[3]

Choledocholithiasis occurring during pregnancy is a serious problem, with potential complications for both mother and fetus. Previous studies have established the safety and feasibility of ERCP during pregnancy, and hence, ERCP is the preferred treatment of CBD stones during pregnancy.[4,5]

On ERCP during pregnancy, failed CBD cannulation after multiple attempts is a difficult and technically demanding situation, which requires rescue techniques such as precut papillotomy, de-roofing techniques, transpancreatic sphincterotomy, or percutaneous rendezvous procedures, which can be associated with potentially serious complications. Endoscopic ultrasound (EUS) guided rendezvous technique has now emerged as a safer alternative and in one of our patients, this technique was successfully attempted after failed CBD cannulation.

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CASE REPORT

A 21-year-old female presented to our hospital Sir Ganga Ram Hospital, New Delhi, with the complaints of pain in the epigastric region with radiation to back, and bilious vomiting for 1 day. She was 20 weeks pregnant. There was no history of fever or jaundice. Clinical examination revealed tenderness in epigastrium, normal body temperature, and the absence of icterus. Ultrasound abdomen revealed multiple stones in the gall bladder and dilated CBD, however lower CBD could not be evaluated because of overlying bowel gases. Obstetric ultrasound revealed single live healthy fetus of 20 weeks gestation. Liver function tests revealed serum bilirubin 2.5 mg/dL (normal: 0.2-1 mg/dL), aspartate transaminase 154 IU/L (normal: 0-40 IU/L), alanine transaminase 172 IU/L (normal: 0-60 IU/L), serum alkaline phosphatase 493 IU/L (normal: 39-117 IU/L), gamma glutamyltransferase 123 IU/L (normal: 5-40 IU/dL). Magnetic resonance cholangiopancreatography was suggestive of single calculus in distal CBD. Based on these investigations, ERCP was planned for CBD clearance and prophylactic CBD stent placement to prevent further complications till the time of cholecystectomy.

Initial endoscopic retrograde cholangiopancreatography procedure details

Pelvis was lead shielded, and use of fluoroscopy was kept to a minimum. Procedure was carried out in the prone position. Midazolam and pentazocine were used for sedation. Blood pressure, pulse rate, and oxygen saturation were continuously monitored, and oxygen was supplemented by nasal prongs throughout the procedure. Initial procedure was performed with duodenoscope (TJF Q180V, Olympus Medical, Tokyo, Japan). Wire-guided deep CBD cannulation could not be achieved even after five attempts as the papilla was eccentrically located and could not be brought to en-face position either by short- or long-loop technique for successful CBD cannulation. Precut papillotomy was contemplated, however could not be performed because of unfavorable papillary position. Further attempts for CBD cannulation were abandoned, and the patient was considered for alternate technique for CBD cannulation. Transabdominal ultrasound guided rendezvous procedure was considered, but was not feasible because of absence of significant intrahepatic biliary radical dilatation. Hence, EUS-guided rendezvous procedure was planned next day.

Endoscopic ultrasound guided biliary rendezvous procedure

Patient was prepared similar to conventional ERCP procedure as mentioned earlier. A linear array echoendoscope (GFUCT180; Olympus Medical, Tokyo, Japan) was used for endosonography. Echoendoscope was gently introduced to the second part of the duodenum without any difficulty and maneuvered to the short position. Endosonography revealed dilated CBD [Figure 1], and a small stone of 8 mm was seen in the distal CBD [Figure 2]. CBD was punctured from the second part of the duodenum in prepapillary part with a 19-gauge needle (Echo Tip 19A; Cook Endoscopy, Winston-Salem, NC, USA) [Figure 3]; subsequently, stellate was taken out, and needle position was confirmed with aspiration of the bile. A 0.035 inch, 450 cm guide wire (Jagwire, Microvasive Endoscopy, Boston Scientific, Natick, MA, USA) was introduced through the needle, and could be manipulated to exit through the ampulla in the first attempt, which was confirmed on the fluoroscopy by the movement of the wire toward the foot end, and multiple loops of the wire were formed in the duodenal lumen. Echoendoscope was taken out, leaving the jag wire in situ. Further procedure was carried out with duodenoscope (TJF Q180V, Olympus Medical, Tokyo, Japan), which was introduced alongside the wire. In the second part of the duodenum, guide wire could be seen coming out of the ampulla, [Figure 4], which was grasped with foreign body forceps, [Figure 5], and taken out through the accessory channel of duodenoscope. Over the wire, triple lumen sphincterotome (Ultratome XL, Microvasive Endoscopy, Boston Scientific, Natick, MA, USA) was introduced, and CBD was cannulated, which was confirmed by flow of bile alongside the sphincterotome.
and aspiration of bile from the sphincterotome. After cannulation, wire was withdrawn and repositioned in the intrahepatic biliary channel, and 1.5 cm sphincterotomy was performed at 11'o clock positions, [Figure 6]. CBD calculus was taken out with the help of Dormia basket (Web TM extraction basket, Wilson-Cook Medical, Winston-Salem, NC, USA), [Figure 7]. Balloon (triple lumen stone extraction balloon, Olympus Medical, Tokyo, Japan) sweep was done for CBD clearance. Subsequently, a 10F, 10 cm straight plastic stent (Boston Scientific, Natick, MA, USA) was placed to protect.

Figure 2. Endoscopic ultrasound image showing a stone in common bile duct

Figure 3. Access needle in common bile duct

Figure 4. Guidewire at ampulla

Figure 5. Grasping of guidewire with foreign body forceps

Figure 6. Sphincterotomy

Figure 7. Removed stone from common bile duct
against the future stone migration into CBD [Figure 8]. Throughout the procedure, fluoroscopy use was kept to a minimum and was done only to confirm the exit of the wire from ampulla, to confirm wire reposition in intrahepatic biliary system, and to confirm the position of the stent. The whole procedure time was 22 min, and fluoroscopy exposure time was 3 s. The EUS and ERCP procedures were performed by two different endoscopists (VS and AA, respectively).

Subsequent course
Subsequent hospital course was uneventful without any new onset pain, recurrence of previous pain, fever or bleeding; and the patient was discharged after 24 h of the procedure in a stable condition with the advice to undergo cholecystectomy and stent removal after the completion of pregnancy.

DISCUSSION

Choledocholithiasis in pregnancy is a rare but serious problem with potential complication for both mother and fetus and warrants ERCP for early stone removal. Failure of initial cannulation is a very challenging and technically demanding situation, as alternative techniques, while increasing the success rate, will also increase the risk of complications like pancreatitis, or bowel perforation that can be life threatening for patient and fetus. Various alternative techniques available are needle-knife precut sphincterotomy, papillary roof excision, transpancreatic sphincterotomy, double wires technique, persistence papillectomy, transabdominal ultrasound rendezvous.

Precut papillotomy is the most common rescue technique in case of failed cannulation, but is associated with increased risk of complications. In general, precut sphincterotomy has a cannulation rate of more than 90% and complication rate of 10%-11%.[6,7]

In the 1990s, EUS-guided biliary intervention was first introduced with fine needle ductal puncture and cholangiopancreatography.[8] Subsequently, Mallery et al.[9] and Kahaleh et al.[10] have reported their experience with EUS-guided biliary rendezvous technique in 2004. Success rates to achieve rendezvous ranged from 33% to 80% while complication rates ranged from 7% to 17%, and include self-limiting pneumoperitoneum, bleeding and bile leak.[11] Thus, EUS-guided rendezvous procedure has become an acceptable alternative to precut papillotomy and is associated with lower complication rate.[12] EUS-guided rendezvous procedure can be performed by transhepatic or extra-hepatic route, and both the techniques have shown high success rates. Extra-hepatic access is a safer technique and is preferred in patients with normal gastroduodenal anatomy. Reported complication rate with extra-hepatic approach varies from 3.2% to 30%.[13] In the present patient, precut was not attempted, because of an unfavorable position of papilla, and EUS-guided extra-hepatic rendezvous procedure was planned. One of the benefits of EUS in this setting of underlying pregnancy is minimum use of fluoroscopy, since many steps can be performed under sonographic guidance rather than fluoroscopy. As EUS can provide accurate information regarding the number of stones in CBD, cholangioram may not be required.

We successfully performed EUS-guided rendezvous procedure during pregnancy in our patient, and, to the best of our knowledge, this is the first case report in the literature on EUS-guided rendezvous procedure during pregnancy. Thus, we conclude that EUS-guided ERCP is a feasible and safe option in pregnancy, and can be attempted in carefully selected patients if the conventional ERCP fails.

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