Endoscopic management of symptomatic choledocholithiasis in pregnancy without the use of radiations

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Abstract. – We report a case of 26-year-old woman at 10th week of gestation with cholestatic jaundice due to a common bile duct (CBD) stone managed by endoscopic retrograde cholangiopancreatography (ERCP). The procedure was successfully carried out without the use of ionizing radiations and under trans-abdominal ultrasonographical (US) control. A few cases are reported in literature in which ERCP was performed without fluoroscopy examination. We believe that ERCP with US guidance is an effective and safe procedure to treat symptomatic choledocholithiasis in pregnant women.

Key Words: ERCP, Pregnancy, Ultrasonography.

Introduction

Biliary disease in pregnancy is a relatively uncommon condition, with an incidence of gallstones of about 4%. Choledocholithiasis may be associated with cholangitis and gallstone pancreatitis. Both these conditions may potentially become life-threatening for both mother and foetus. Common bile duct (CBD) obstruction due to stones during pregnancy, particularly in the first and third trimesters, is still a big challenge for the endoscopists, since the management of stones normally requires the use of radiation. Literature data dealing with this issue are still based on small series and several case reports. Nevertheless, endoscopic retrograde cholangiopancreatography (ERCP) is considered as a safe and effective alternative to surgery for management of choledocholithiasis complicating pregnancy. Usually, ERCP procedures require fluoroscopy to assess biliary anatomy and to confirm the sphincterotome position in the bile duct. Surely, in pregnant women all kind of precautions were taken to minimise exposure to radiation.

We hereby report a case of a successful endoscopic treatment of symptomatic choledocholithiasis in a pregnant woman without the use of radiation.

Case Report

A 26-year-old woman at tenth week of gestation was admitted to our hospital for right upper quadrant pain radiated to the right shoulder accompanied by nausea and vomiting. At the admittance, she complained a history of cholecystolithiasis. A physical examination showed jaundice. Total serum bilirubin was 9.51 mg/dl (n.v. < 1), alkaline phosphatase (ALP) 210 units/l (n.v. 28-128), γ-glutamyl-transpeptidase 114 units/l (n.v. < 35), aspartate aminotransferase (AST) 99 units/l (n.v. < 25), alanine aminotransferase (ALT) 166 (n.v. < 25), serum amylase was 103 units/l (n.v. < 160). No fever was recorded. An abdominal ultrasound examination showed a mild dilation of the intra-hepatic biliary tree with a grossly dilated common bile duct (14.2 mm) and a stone in the distal portion. The stones were also evident into the gallbladder. On the second day of hospitalisation, total serum bilirubin increased to 11.40 mg/dl, AST 140 units/l, ALT 201 units/l, ALP 910 units/l. Because of the worsening of jaundice and laboratory parameters, considering the high risk of
bilious-pancreatic complications, at the fourth day, the patient underwent ERCP. Although the patient was given precise and detailed explanations concerning the benefits and the risks of the procedure, and an informed consent for ERCP was obtained, she refused to be exposed to ionizing radiations. Thus, the need emerges as to whether the endoscopic procedure could have been drawn. The first step was a moderate sedation (midazolam 2.5 mg iv). The patient was in the left side position. The duodenoscope was introduced into the oesophagus, stomach and duodenum, and finally the major papilla was approached. The papilla appeared to be oedematous, nevertheless the bile duct seemed to be successfully cannulated with a standard catheter. Subsequently, the catheter was advanced in the biliary tract over an hydrophilic-coated guidewire (Jagwire® 0.035 inch). Thereafter, the guide-wire was used to facilitate the access and progression of the sphincterotomy in the biliary tract. Bile aspiration, to verify the correct position of the sphincterotomy, did not allow to confirm cannulation of the bile duct. In fact, the aspirated material was a white watery material like pancreatic juice. Thus, the correct positioning in the biliary duct was then confirmed by a careful trans-abdominal ultra-sound evaluation of the Common Bile Duct (CBD) (Figure 1). This was achieved by means of moving the patient slowly and carefully from left-sided to supine position and back. US scan (7.5 Mhz convex probe) allowed to precisely show both the sphincterotomy position in the CBD and the stone position. A large sphincterotomy with standard technique was performed. A 2-cm oval gallstone was then extracted using a balloon stone removal-catheter (Figure 2). The whole procedure lasted 25 minutes about. No fluoroscopy or spot radiographs were used. After ERCP procedure with stone removal, patient’s conditions and symptoms rapidly improved. Normalisation of bilirubin levels and of the other laboratory parameters was achieved. A US scan demonstrated a remarkable reduction of the CBD diameter, which occurred within 4 days. The patient was discharged on the 10th day after admission. Actually, she and the foetus are in good health. The patient is candidate to a laparoscopic cholecistectomy in election.

Discussion

We managed a 10th week gestation woman admitted to the hospital for the onset of jaundice and epigastric pain. Laboratory parameters and US scan evidenced a cholestatic jaundice due to a gallstone in the distal part of CBD. No fever was recorded.

Since this pathology affected a pregnant woman, the problem to face with was how to manage gallstone extraction without any risk for the foetus. We performed a ERCP with an endoscopic sphincterotomy without the use of X-ray. Abdominal ultrasound (US) was utilized for both
locate the stone within the CBD and confirm the correct cannulation of the biliary duct and of the subsequent stone removal. Pregnancy is associated with an increased risk of gallstones development due to transient alterations in the biliary system. Indeed, the impairment of gallbladder motility and increase of lithogenicity of bile, which becomes saturated with cholesterol, create a favourable environment for gallstones formation. US studies demonstrate gallstones in 5% to 12% of pregnant women. A minority of these ones develop symptoms or complications such as cholecystitis and pancreatitis related to persisting stones in the CBD. Surgery during pregnancy is associated with an increased rate of preterm labour spontaneous abortion, thus, if it is needed, it should be delayed to the post-partum period, whenever possible, or performed at least in the third trimester. Endoscopic treatment of choledocholithiasis during pregnancy is currently recommended instead of surgery and several studies have demonstrated that ERCP is safe and effective if performed by trained endoscopists. The American College of Obstetricians and Gynaecologists recommends of using during pregnancy imaging modalities that do not produce ionizing radiation such as magnetic resonance and US. During the whole of gestation, the maximum permitted dose of ionising radiation to the foetus is 500 mrem. During an ERCP procedure from 25 to 2000 mrem of ionising radiation can be emit. Although most investigators who perform procedures during pregnancy take precautions to minimize exposure to radiation (i.e. shielding the lower abdomen and pelvis and minimizing fluoroscopy time), the risk of harmful effects on fetus may not be altogether excluded. Thus, we performed an ERCP without radiation assistance and only by ultrasonographic guidance. Unfortunately, the aspiration of CBD content (watery material not typically biliary) did not allow us to confirm the cannulation of the bile duct. Indeed, it is well known that in case of severe CBD obstruction due to stones, the bile assumes a clear colour for the regurgitation of the bile pigments in the sinusoidal liver circle. Thus, a careful ultrasonographic evaluation allowed us to ascertain the correct position of the sphincterotomy in the bile duct and the subsequent stone removal. Scanty literature data showed the use of ERCP without the radiation. Parada et al. and Freistulher et al. reported, respectively, two cases of successful endoscopic papillotomy performed in eleven-week-pregnant women with severe biliary pancreatitis under ultrasonographic control. Moreover, a case in whom endoscopic stone extraction without fluoroscopic examination was successfully carried out by means of magnetic resonance cholangiopancreatography (MRCP) before the ERCP procedure was recently presented by Bagcici et al.

In conclusion, we believe that ERCP with US guidance is an effective and safe procedure to treat symptomatic choledocholithiasis in pregnant women who refuse the exposure to ionizing radiations and without other bilio-pancreatic pathological conditions.

References


