Two Stage Endoscopic Approach for Management of Choledocholithiasis during Pregnancy

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Abstract

Background and aim. Management of choledocholithiasis during pregnancy is difficult. The aim of this study was to evaluate the safety and efficacy of managing common bile duct (CBD) stones during pregnancy using a two-stage procedure without any fetal radiation exposure. Patients and methods. Eleven consecutive pregnant women treated endoscopically for choledocholithiasis between 1996-2005, at a tertiary referral center, were included in this study. All the patients were treated by biliary sphincterotomy and stenting without any fluoroscopy or ultrasound assistance during pregnancy and definitive ERCP and stone clearance after delivery. Patients were followed at one week and were asked to come for definitive treatment after delivery. Results. All 11 patients were experiencing pain and jaundice while two patients had cholangitis. Abdominal ultrasound revealed dilated CBD in all patients and stones in 8 patients. Every patient demonstrated marked relief after the first stage procedure without any complication. ERCP after delivery revealed no CBD stones in one patient, 5-8 mm size stones in 8 patients and large stones (>15mm) in two patients. One patient with large CBD stones required mechanical lithotripsy while another required surgery. CBD was cleared in 8 patients with small stones. Long-term fetal and maternal outcome was good in all the patients. Conclusion. A two stage approach consisting of initial sphincterotomy with stenting without fluoroscopy during pregnancy followed by definitive ERCP after delivery seems to be a justified approach. This is the best most definitive way of avoiding radiation exposure to the fetus.

Key words
Choledocholithiasis – pregnancy – endoscopic management.

Introduction

One in 1,200 pregnancies is complicated by choledocholithiasis which is the most common indication for ERCP [1]. Fetal exposure to radiation is the most important concern during ERCP. The golden rule for fetal safety is that no exposure is better than any exposure. It is recommended that exposure should not exceed 1mSv in first trimester and 5mSv over the entire gestation [2]. The largest series assessing fetal exposure dose was published by Kahaleh et al [3]. The authors stressed the need for measuring fetal exposure rather than exposure time during fluoroscopy. Because of the risk of fetal radiation exposure and difficulty in calculating fetal radiation dose, various authors have published their experiences of managing choledocholithiasis without fluoroscopy [4-10]. In these series bile duct cannulation was confirmed using abdominal ultrasound or aspiration of bile while needle knife sphincterotomy was done in patients with bulging ampulla due to impacted stone. Most of these reports are in form of case reports and only in one series [4] six patients were included. We present a simplified two-stage approach in 11 pregnant patients with common bile duct (CBD) stones in whom, during pregnancy, biliary sphincterotomy and stenting were performed without any radiological assistance and after delivery a definitive ERCP and CBD clearance was performed.

Patients and methods

Eleven symptomatic pregnant patients with choledocholithiasis were managed between 1996-2005 (first trimester 2, second trimester 6 and third trimester 3). Olympus therapeutic endoscopes with 4.2 mm channel size were used. Abdominal ultrasound and liver function tests were performed in all patients. These patients were subjected to a two-stage procedure after obtaining written informed consent. Approval from the local Ethical Committee was taken.

First stage

During pregnancy, patients were subjected to biliary sphincterotomy and stenting without exposure to radiation. The procedure was done under conscious sedation using
midazolam, and intravenous hyoscine hybromide was used for duodenal relaxation. In fact the procedure was done in the endoscopy lab where no facility for fluoroscopy was available so any temptation to use fluoroscopy was prevented. Initial CBD cannulation was done with the help of a double lumen sphincterotome, deep cannulation was achieved and bile was aspirated to confirm CBD position. After deep CBD cannulation the guide wire was passed and complete biliary sphincterotomy was done over the guidewire. In cases where deep CBD cannulation was not possible, after two attempts the conventional sphincterotome was removed and patients were subjected to needle knife sphincterotomy. Once the biliary orifice was identified a complete biliary sphincterotomy was performed using a conventional double lumen sphincterotome after confirming location inside CBD. After the biliary sphincterotomy, a Zag guidewire was left in place and a 7Fr double pigtail stent was placed in the CBD. Patients were kept nil orally for 6 hours after procedure and I.V. fluids and I.V. cefotaxim 1gm bid was given for one day followed by oral antibiotics for 5 to 7 days. Patients were followed up after 7 days. All patients were asked to come for definitive second stage procedure 4 weeks after delivery.

Second stage

After delivery all the patients were subjected to definitive ERCP. Biliary stents were removed and cholangiogram was obtained in all patients. All small stones were removed with Dormia basket while one patient with a single large stone was subjected to mechanical lithotripsy. Patient with multiple large stones was subjected to surgery. Eight patients were on regular follow-up for 2-6 years after procedure.

Results

All 11 patients had marked symptomatic improvement after the first stage procedure and were discharged without any complications. There was a significant improvement in the altered liver function tests at one week. Ten patients came for definitive second stage procedure, 4-6 weeks after delivery and one patient came for second stage procedure 3 years after the first stage procedure. All patients had normal full term delivery. In all 11 patients stents were seen in situ but stents were completely blocked in 4 patients and bile drainage was seen at the side of the stents while in 7 patients bile drainage was seen through the stent as well as at the sides of stent. Endoscopic retrograde cholangiography revealed no CBD stone in one patient, 4-8 mm stones in 8 patients, a single large stone in one patient and multiple large stones in one patient. In all patients with 4-8 mm stones, CBD could be cleared with the help of a Dormia basket, as sphincterotomy was already present. One patient with a large CBD stone was subjected to mechanical lithotripsy and CBD clearance while another patient with multiple stones was subjected to open surgery. In fact, the patient with multiple large stones presented 3 years after initial stenting and during this period had another asymptomatic pregnancy and normal delivery. Eight patients who are in regular contact, 2-6 years after second stage procedure were normal including normal babies.

Discussion

Symptomatic choledocholithiasis during pregnancy poses a risk to both mother and fetus and management of such patients is difficult. Radiation exposure to the fetus may produce various developmental abnormalities and it is difficult to calculate a dose of fetal radiation from exposure time. There is only one series reported from India [11]. In the Indian series comprising 18 patients, radiation exposure was made in 11 patients with safe outcome reported for both fetus and mother. Series involving larger number of patients [12,13] have reported some form of fetal loss and complications with radiation exposure. The golden rule to avoid fetal complications is to avoid radiation as much as possible. The present study was based on this golden rule. Various publications involving a small number of patients have reported their experience on ERCP during pregnancy without fluoroscopy [4-10]. The different approaches in these publications were bile aspiration for confirmation of CBD cannulation, sphincterotomy and balloon extraction of stones. All these approaches are not perfect with regard to complete CBD clearance and for complete CBD clearance fluoroscopy, exposure is a must.

Therefore, in our series we adopted the policy of no radiation exposure during pregnancy, also to ensure bile drainage to keep the patient symptom-free till delivery. This was made possible by biliary sphincterotomy and stenting. Addition of sphincterotomy to stenting was very important because it allowed drainage of the bile even after stent block in 4 patients. One of these 4 patients came for the second stage procedure 3 years after the first stage procedure and had a second successful delivery. Without sphincterotomy, stents would get blocked in 3-4 months and patients may come back with severe cholangitis. Sphincterotomy also allows the passage of small stones.

There seems to be two problems with this approach, one that the stent may go into the gallbladder and another that the stent may not go above an impacted stone in mid or upper CBD which itself is a rare situation and can be anticipated from pre-procedure ultrasound. In one of our patients the stent was placed in the gallbladder but the patient remained asymptomatic. Using the left lateral position and new glide wire minimizes the chances of gallbladder placement. This approach requires lot of experience with ERCP. In all patients, a post procedure abdominal ultrasound should be performed to ensure the position of stent in CBD above the stone.

After the first stage procedure, the second stage procedure was very simple and it consisted of the scope removal of the 7 Fr stent, obtaining a cholangiagram and removal of small stones, as papillotomy was already present. Only patients with large stones required mechanical lithotripsy or surgery. No complications in this series appeared to be due to minimal manipulation of ampulla to enter CBD (only two
attempts) and early needle knife sphincterotomy. Occurrence of complications during or after ERCP is a matter of chance as no complications can be seen in a consecutive series of 50 patients and then the next three patients may have complications. Since this is a retrospective study, some of the complications might have been underreported, and this is the main limitation of our study. No fetal complications occurred and babies were healthy after 2-6 years of follow up.

We conclude that this two stage procedure of managing choledocholithiasis without any radiation exposure during pregnancy is definitely associated with less risks to the mother and fetus. If more centers with experienced endoscopists would adopt this approach and present their experience, it will help to understand better this method of treatment.

Conflicts of interest

None to declare.

References