OUR EXPERIENCE WITH DIAGNOSTIC AND THERAPEUTIC CHOLEDOCHOSCOPY

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ABSTRACT

Flexible choledochoscope was used in 16 patients undergoing common bile duct (CBD) exploration for suspected stones. Stones were found in the CBD in 4 patients in whom intraoperative cholangiogram was normal. T-tube cholangiogram done between the 10th and 14th postoperative days was normal in all 16 patients. None of the patients had symptoms suggestive of retained stones during follow-up ranging from 6 to 19 months. We feel that the use of choledochoscopy in patients undergoing CBD exploration will help reduce the incidence of retained stones.

MJAFI 1997; 53 : 116-118

KEYWORDS : Cholangiography; Choledocholithiasis; Choledochoscopy.

Introduction

Common bile duct (CBD) stones are a frequent cause of obstructive jaundice. If, at operation, complete clearance of stones from the CBD can be ensured, prompt and lasting relief from jaundice is possible. However, retained stones are seen in 6 to 10 per cent of patients undergoing CBD exploration alone [1,2]. In an attempt to reduce this important cause of postoperative morbidity, the flexible choledochoscope is being used by more and more biliary surgeons [3-5]. We describe here our experience with the use of the choledochoscope in 16 patients with choledocholithiasis. As we move into the laparoscopic era of surgery in the Armed Forces, knowledge of the technique of choledochoscopy will become increasingly important [6,7].

Material and Methods

Thirty two patients with obstructive jaundice due to suspected CBD stones were seen in our hospital between October 1993 and June 1995. Sixteen of them underwent choledochoscopy as part of their surgical management. Criteria for inclusion in the study were (a) preoperative diagnosis of stones in the CBD, (b) palpable stones

within the CBD at operation, (c) dilated CBD with history of recent or remote jaundice.

Patients were taken up for cholecystectomy and CBD exploration after relevant haematological and biochemical investigations. A transverse or oblique subcostal incision was used. After cholecystectomy in the usual manner, an intraoperative cholangiogram (IOC) was done either through the cystic duct (5 patients) or by direct puncture of the CBD (11 patients). A vertical choledochotomy was then made between 3'0' catgut stay sutures. Any stones encountered were then removed with stone holding forceps. The CBD was then flushed with saline using a 8 Fr paediatric feeding cannula attached to a 20 mL syringe. Once these conventional steps were completed, choledochoscopy was done in all 16 patients.

Technique of choledochoscopy : Olympus CHF-P10 choledochoscope was used in all cases. The scope is introduced through the choledochotomy opening and manoeuvred towards the hepatic ducts. The stay sutures are then crossed over to minimize leakage of irrigating fluid. Inspection of the left and right hepatic duct and branches is then carried out in a systematic fashion. The scope

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is then withdrawn and reintroduced towards the lower end. Next, a cannula is manoeuvred into the papillary channel under vision. This step is very important to ensure patency of the intramural portion of the CBD. Free passage of the cannula back and forth is ensured before it is withdrawn. When stones are encountered, they are removed with the help of a basket or by flushing with saline through a cannula. Before finally withdrawing the scope it is passed once again towards the hepatic ducts. This step ensures that no stones or fragments have been pushed upwards during flushing with saline. The choledochotomy is then closed over a T-tube (16-18 Fr, latex).

We did not do postexploratory cholangiogram (PEC) in our patients. A T-tube cholangiogram was done in all patients between the 10th and 14th postoperative day. Patients were discharged 1 or 2 days after the T-tube cholangiogram.

Results

There were 12 females and 4 males in our study. The mean age was 39.7 years.

Intra-operative cholangiogram was unsatisfactory in 6 of the 16 patients (37.5%) due to either poor quality pictures or difficulty in interpretation of findings. Cholangioscopy allowed good visualization of the bile duct lumen. It was possible to see up to the third division of hepatic ducts in 12 (75%) patients. A cannula could be negotiated across the papilla in all patients but 1, while the scope itself could be negotiated across the papilla in 2 patients. Although saline leakage from the site of choledocholithotomy was a problem, it did not interfere with proper visualization of the duct lumen. An average of 750 mL of irrigating fluid was used per patient. Cholangioscopy added an average of 22 minutes to the operating time. In 4 patients (25%) cholangioscopy was useful in detecting stones and fragments of stones after the CBD had been flushed with saline. In 2 of these cases, stones were found in the hepatic ducts and were removed by basketing. None of the T-tube cholangiograms revealed any filling defects in these 16 patients. Patients were followed-up for 6 to 26 months and all remained asymptomatic.

There were no significant complications attributable to the procedure in any of our patients. Cholangioscopy did not seem to affect postop-

erative morbidity, antibiotic and analgesic requirement, T-tube withdrawal time, or hospital stay.

Discussion

Exploration of the CBD involves additional morbidity which may vary from 15 to 30 per cent [8]. The presence of the T-tube, peritubal leakage of bile, localized collections and possibility of infection contribute to the morbidity. The overall morbidity is further increased by the presence of retained stones following CBD exploration. Various methods are undertaken to reduce the incidence of retained CBD stones. Preoperative cholangiograms, both before and after exploration, are commonly employed by most surgeons. However both are not foolproof and involve considerable radiation exposure for the patient as well as for the operating team. While IOC has its merits it may lead to some unnecessary explorations of the CBD [9]. More importantly, it may lead to stones being missed in some patients if the procedure is not carried out properly [3]. In our patients, stones were discovered during cholangioscopy in 4 patients in whom IOC was normal. Others have reported a similar experience [3,10]. Postexploratory cholangiography has similar drawbacks. In addition when stones are detected during PEC the choledochotomy needs to be reopened, adding to operating time and morbidity. We chose not to perform PEC, as our study protocol involved a T-tube cholangiogram in all patients.

Cholangioscopy offers many advantages to the biliary surgeon. Its use avoids radiation exposure and also its use leads to a decrease in the incidence of retained stones. This is implied by the absence of retained stones during follow-up in all 16 patients in our series. Studies involving larger number of patients have also established this finding [3-5,11]. In our study stones were detected in the hepatic ducts in 2 patients. It is not possible to say whether these stones were pushed into the upper part of the biliary tree by the irrigating fluid or whether they existed there from the beginning. This is however an important observation since most surgeons carry out thorough flushing of the ducts after instrumentation. Whether some of the 'recurrent' stones after a 'thorough' clearance of the CBD are, in fact, retained stones as a result of some fragments or stones finding their way up the

hepatic duct branches is a moot point.

Choledochoscopy can be employed for extraction of postoperative retained stones via the T-tube tract if such a tract exists. Although we did not have occasion to try this out, successful stone extraction in this manner has been reported [12]. In addition T-tube tract choledochoscopy has also been used for laser [13,14], and electrohydraulic [17] lithotripsy.

Another advantage of choledochoscopy is that it does not increase the morbidity of CBD exploration even in seriously ill patients [16].

However, choledochoscopy has its limitations too. It increases operating time. In our series an average of 22 minutes of extra operating time was needed. This has been the observation of other investigators as well [17]. However, both IOC and PEC also involve additional anaesthesia time. Besides, with experience, it is possible to do a thorough inspection in about 10 minutes [18]. In addition, its use requires training in endoscopic techniques. This technique is, however, not very difficult to master.

Complications such as bacteremia, cholangitis and even perforation can occur but are uncommon [19]. We did not encounter any complications, minor or major, in our patients.

In the light of the benefits and drawbacks discussed above, the indications for choledochoscopy are, all common duct explorations, examination of questionable radiological defects before or after instrumentation of the CBD, biopsy of intraluminal lesions, and removal of retained CBD stones postoperatively through T-tube tract. The only absolute contraindication for choledochoscopy with the flexible scope is common duct diameter lesser than that of the instrument available.

Based on our study and on the basis of available literature, choledochoscopy can be described as a useful tool in the armamentarium of the biliary surgeon. It is a technique well worth mastering in this era of laparoscopic surgery [6,7,20].

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