ENDOSCOPIC RETROGRADE CHOLANGIOGRAPHY AS A PRELUDE TO LAPAROSCOPIC CHOLECYSTECTOMY

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ABSTRACT

Seventy patients undergoing laparoscopic cholecystectomy were evaluated with endoscopic retrograde cholangiography (ERC) preoperatively. All the ERCs were performed by the laparoscopic surgeon, 1 to 30 days prior to surgery. In all cases including those converted to open cholecystectomy (5 out of 70, 7.1%), ERC helped in clear delineation of the biliary tree, cystic duct and gallbladder, making dissection of the Calot's triangle safe. Four cases of common bile duct (CBD) stones detected at ERC were managed by papillotomy and basketing. In nine cases (12.8%), anomalies of the biliary tree were detected. Average time taken for ERC was 12 minutes (7-28 minutes); while intraoperative cholangiogram (one case) took 25 minutes. ERC gives a clear outline of the biliary anatomy and greatly facilitates laparoscopic cholecystectomy. It helps avoid open cholecystectomy because of CBD stones. It also reduces the laparoscopic operating time by the duration normally taken to do intraoperative cholangiography.

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KEY WORDS : Cholangiography; Endoscopy; Cholecystectomy; Laparoscopy.

Introduction

There is considerable concern about the occurrence of biliary ductal injury during laparoscopic cholecystectomy [1]. Various studies have reported an incidence of 0.01 to 2.0% biliary tree injuries [2,3]. Delineation of the biliary tree during or prior to gallbladder surgery is essential to minimise the risk of injury to the ductal system [4,5]. Investigations such as ultrasound examination, computed tomography (CT) scan, scintigraphy, percutaneous transhepatic cholangiography, infusion cholangiography, ERC and peroperative cholangiography can help evaluate the biliary anatomy. The presence of any CBD stones can be detected and appropriate management planned. We decided to study the usefulness of ERC as a preoperative investigative tool in our laparoscopic cholecystectomy (LC) patients.

Material and Methods

Seventy laparoscopic cholecystectomies were done between Nov 1991 and Sep 1992, all performed by a single team. There was no preselection of patients for LC. There were 14 males and 56 females, with a mean age of 42.5 years (27 to 69 years).

ERC was carried out as part of the routine workup in all cases. The procedure was performed by the surgeon doing the laparoscopic cholecystectomy. Siemen's C - Arm screening machine and Olympus EVIS 100 video endoscopic system were used throughout. ERC was done 1 to 30 days before the laparoscopic cholecystectomy (Table 1). The majority of patients (59 cases, 84%) were operated within 48 hours of the ERC. Long interval between ERC and surgery in 3 cases was for the convenience of these patients. Biliary tree was cannulated either directly or after papillotomy when necessary. When CBD stones were encountered (four patients, 5.7%), they

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TABLE 1
Time lag between ERC and LC

Time lag (days)	Cases	Percent
< 1	21	30.0%
1-2	39	55.7%
2-3	7	10.0%
3-30	3*	4.2%

* LC was done on 7th, 21st, and 30th days.

were removed by sphincterotomy and basketing (these stones were also detected at ultrasound). Complete clearance of the CBD was confirmed by contrast studies before terminating the procedure. Finally a separate film was taken with the patient in the supine position for facilitating orientation of the gallbladder and cystic duct in relation to the common hepatic duct and the CBD.

One patient had a large periampullary diverticulum. The papilla was located within the floor of the diverticulum, and only the pancreatic duct could be cannulated. This patient underwent an intraoperative cholangiogram during LC.

All patients were given Inj gentamicin 1.5 mg/kg and Inj metronidazole 500 mg IV bd for 24 hours, with the first dose being given just prior to the start of the endoscopic procedure. When a papillotomy was done, the same regimen was continued for a further 24 hours. Fifty nine patients who underwent LC within a day or two of ERC stopped getting antibiotics on the evening of the operation. The remaining received additional two doses of the same antibiotics.

TABLE 2
Anomalies of the biliary tree in 70 patients

Short cystic duct	1
Anterior insertion of the cystic duct	2
Medial insertion of the cystic duct	1
Low insertion of the cystic duct	1
Dilated cystic duct	1
Dilated CBD	3
Total	9

Results

There were 5 conversions in 70 cases (7.1%), none of which was necessitated by bile duct injury. ERC revealed variations in the anatomy of the biliary tree in 9 cases (12.8%) as shown in Table 2. Dilated CBD was detected in three cases while cystic duct dilation was seen in one case. The cystic duct was very short in one case and was anomalously inserted into the CBD in four cases (Figs 1 & 2). There were four cases (5.7%) of CBD stones and these were removed by sphincterotomy and basketing. The mean operating time was 44 minutes (range 25 to 100 minutes), excluding converted cases. ERC was carried out in 64 out of 70 patients (91.4%) without sphincterotomy. ERC took a mean of 12 minutes (range 7-28 minutes) more time being taken for cases where basketing of stones was done. Intraoperative cholangiogram (done in one patient in whom ERC was not successful) took 25 minutes from

Fig. 1 : Insertion of the cystic duct near the trijunction

Fig. 2 : Insertion of the cystic duct on the medial aspect of CBD.

the beginning of cystic duct cannulation to perusal of films. Three patients (4.2%) had fever following ERC. There were no cases of pancreatitis following ERC. None of the patients required CBD exploration. The four patients who had CBD stones underwent ultrasound examination three months after surgery. None had any retained stones.

Discussion

Laparoscopic cholecystectomy has gained wide popularity the world over. With the initial enthusiasm getting replaced by a more analytical approach, the increasing incidence of biliary injuries assumes importance [6-8]. It is also possible to visualize the future laparoscopic surgeon doing cholecystectomies without adequate experience in open opera-

tions. In this context, it is imperative that a clear knowledge of the disposition of the biliary tree be available to the operating surgeon, so that he can minimise the chances of injury to biliary system. This can be achieved by ERC or infusion cholangiogram prior to the operation.

Intra-operative cholangiogram helps assess the length of the cystic duct and its proximity to the extrahepatic ductal system [9]. However, it suffers from certain disadvantages. It takes up additional anaesthesia time. The pictures are often not of high quality. If stones are detected in the CBD, it may necessitate conversion to an open operation in the majority of centres, nullifying the benefits of laparoscopic cholecystectomy. Finally, the procedure of cannulating the cystic duct during laparoscopy is by no means easy, and is time consuming [10]. An infusion cholangiogram or ERC can give the same information preoperatively so that a decision for open cholecystectomy can be made in relevant cases. Infusion cholangiogram has a reported diagnostic error of nearly 40% [1]. Visualization of the biliary tree is often very poor or totally absent. We prefer ERC as delineation of the biliary tree is excellent. It also facilitates removal of CBD stones when detected, in the same sitting. CBD exploration, associated with a morbidity of 15 to 20%, is thus eliminated. The patient therefore gets all the benefits of laparoscopic cholecystectomy. None of our conversions was due to inadequate information gained at ERC. Morbidity associated with the procedure in present series was minimal (4.1%), and compares well with that reported by others [12]. There was no mortality. In addition, ERC was useful in detecting variations of the cystic duct anatomy warranting a more careful dissection of Calot's triangle. Incidence of 9% anomalies of the biliary tree in present series is similar to that observed by others [8,13]. Absence of any biliary injury in present series was due to a clear knowledge of the biliary anatomy prior to surgery. It is concluded that where facilities exist, ERC should form a part of the routine preoperative workup of all patients

undergoing laparoscopic cholecystectomy.

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