Laparoscopic Ultrasound Feasibility And Effectiveness

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Abstract

BACKGROUND: This prospective study was done to assess the possibility of performing laparoscopic ultrasound during cholecystectomy and the accuracy as a diagnostic tool for the stone in the common bile duct.

MATERIALS AND METHODS: Seventy patient with gall stones were included in the study, patient with dilated bile duct with or without visible CBD stone were excluded.

RESULTS: The procedure was completed safely with 63 patient, in 48 patient the CBD was seen clearly and stone was delineated in three patient only.

CONCLUSIONS: In our experience Intraoperative ultrasound could not give us a secure diagnosis of the CBD stone. This might be attributed to the learning curve, but despite of that there was the advantage of suspicious cases that were followed by ERCP.

Introduction

Intra-operative cholangiography is the gold standard for the CBD stone diagnosis during surgery, but the procedure is taking a long time to perform and most of the surgeon were advocating it for certain cases. Intra-operative ultrasound is a promising, fast and non-invasive with longer learning curve and a facility which might not be available.

Intra-operative cln recent Years it has been repeated attempts by Surgeons for the assessment of the Biliary system during Laparoscopic surgery to overcome the difficulties of laparoscopic cholecystectomy.

Our aim was to assess if the routine use of intraoperative laparoscopic ultrasound during cholecystectomy is of any diagnostic help in detecting occult cholelithiasis, Improve the dissection in acute cholecystitis and prevent bile duct injuries.

Methods

This is a prospective study on 70 consecutive cases who were scheduled for laparoscopic cholecystectomy. The study was conducted from August 2006 to August 2008. Laparoscopic Ultrasound (LUS) was performed on all patient except on patient where the common bile duct (CBD) is dilated, a high Liver enzymes, history of jaundice or pancreatitis and all patient who had preoperative Endoscopic Retrograde Cholangio-pancreatography (ERCP).

Ultrasound is performed at the beginning of the surgery and if necessary it could be repeated at any stage of the course of the LC, the procedure is not completed in obesity and trocar site bleeding. Radiologist was present in the first few cases of the study.

Selection of patient: All patients with suspected stone in the CBD were sent for ERCP. Seventy patient were eligible to undergo laparoscopic intra-operative Ultrasound (LUS). The procedure was performed after insertion of 12mm trocar through the umbilicus and 10mm through the epigasric region. Aloka 7.5-MHz flexible linear laparoscopic transducer was used for for scanning(Figure 1). The ultrasound machine is adjacent to the LC tower.

Discussion

The standard preoperative workup for patients presenting with gall stones has reduced the need for IOC. Liver function tests, abdominal ultrasound, combined with clinical exam and history, constitute the entire workup for most patients. Any abnormality by the previous test may suggest the presence of cholelithiasis. Unfortunately, these two methods for the CBD stone prediction is, are nonspecific and unreliable, (5). MRCP and ERCP are also available methods for diagnosis a preoperative CBD stone (4,6,7).

MRCP has the ability to accurately detect CBD stones and thus, noninvasively select those patients most likely to benefit from a preoperative procedures such.
as ERCP. Or exploration of the CBD (8). ERCP is not without complication such as bleeding perforation or acute pancreatitis. For this reason, the current use of ERCP as a routine screening tool for purely diagnostic purposes carries substantial risks. (9)

McFarlane et al., suggested categorizing the risk of CBD stone into groups to be able to identify those who are in real need for different type of intervention patients are classified preoperatively into high, and low risk groups. The high risk includes those patients with obvious clinical jaundice or cholangitis, choledocholithiasis or a dilated CBD on ultrasonography. Patients with a history of pancreatitis or jaundice, elevated preoperative bilirubin and alkaline phosphatase levels or multiple small gallstones carry a high risk of choledocholithiasis. Patients with large gallstones, without a history of jaundice or pancreatitis and with normal liver function tests are considered unlikely to have CBD stones and therefore at low risk. In our opinion these are the group that needs IOU.(3)

We implemented this principle with learning curve in applying IOU we could identify only two positive cases which makes it 3%.

Choledocholithiasis may occur in up to 3%-10% of all cholecystectomy patients of the mixed group, or as high as 14.7% in some series(2). Laparoscopic ultrasound did not gain popularity because of the learning curve of performing it confidentially and the cost of the apparatus with the probe. compared to the Intra-operative cholangiography nevertheless it is considered faster than IOC, safe and non-invasive technique. (1).

In recent years with the LC, intra-operative cholangiography (IOC) is not widely practiced, however high resolution ultrasound and pre-operative investigations assisted in identifying those who need further investigations such as Endoscopic Retrograde Cholangio Pancreaticography (ERCP) or Magnetic Retrograde Cholangio Pancreaticography (MRCP) prior to surgery.

These tests lowered the need for the routine IOC, however it is still applied for difficult LC and for assessing the anatomy and the anomaly of the biliary tree. Our result showed that the LOS needs more training and interpretation. The diagnostic accuracy can not be assessed in the negative cases.

From a technical point of view, LUS is a more difficult procedure to perform and interpret the images accurately(1,2). Very few surgeons are familiar with the equipment and needs technician to assist in manipulating the US. The results strongly depend on the operator's expertise. This is only achieved with experience whereas IOC can be performed and interpreted with very little training.

**Conclusion**: Despite the safety of the LUS the accuracy needs to reassessed and with recent high resolution scanning the learning curve could be shortened with improvement of the sensitivity and specificity prior to its generalization.

**REFERENCES**

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Illustrations

Illustration 1

Ultrasound Probe specification

Illustration 2

Gall Bladder Scanning, illustrating gall stone
Illustration 3

Age Distribution

Illustration 4

Scanning of the Porta hepatitis
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