ROLE OF PREOPERATIVE ULTRASONOGRAPHY IN IDENTIFYING POTENTIAL PROBLEMS IN LAPAROSCOPIC CHOLECYSTECTOMY.

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INTRODUCTION

Since its introduction in 1987, laparoscopic cholecystectomy has rapidly established itself as a viable alternative to conventional open cholecystectomy. In many countries, it is now the method of choice in dealing with cholelithiasis. This procedure was initially recommended as a treatment for patients with billiary colic, but with increasing experience, it is being offered to patients with cholecystitis or pancreatitis, as well as patients with a previous history of abdominal or pelvic surgery.[1] The present literature indicates that laparoscopic cholecystectomy can be carried out successfully in at least 90% of cases of symptomatic cholelithiasis,[1-6] with success rates of 95% being achieved in some studies.[1-2-6]

Laparoscopic cholecystectomy (LC) is now the gold standard treatment of symptomatic gallstones and is the commonest operation performed laparoscopically worldwide. The indications for its use in the treatment of gallstone are the same as open operation although the cholecystectomy rate has increased by an average of 20%, including in Scotland, since the introduction of LC.[3-9] The exact reasons for this are not known but the rise is somehow linked to perceptions on the part of patients, general practitioners and surgeons that the magnitude of the intervention is reduced by the laparoscopic approach. To a large extent, this is true but the potential for overall morbidity associated with the surgical treatment of gallstone disease is increased by the higher cholecystectomy rate which also impacts on the overall health care costs. In contrast, large retrospective series of LCs from several countries indicate that the overall mortality of cholecystectomy has decreased since the advent of the laparoscopic approach.[4-10]

Clearly, preoperative ultrasound evaluation has a limited role to play in the detection of adhesions, but it would be expected to play a role in the detection of acute and chronic inflammation of the gall bladder and possible in the detection of aberrant anatomy. The object of this study was to assess the role of preoperative ultrasound evaluation of the gall bladder in predicting difficult or failed laparoscopic cholecystectomy.

SUBJECTS AND METHODS

A preoperative ultrasonography was performed in the Center for Nuclear Medicine and Ultrasound, Rangpur during the period of january/2004 to june/2004. A total of 60 patients (47 women

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and 13 men, age range: 31 years to 59 years, were diagnosed to be Cholelithiasis, ultrasonography and Laparoscopic surgery were done. The indications for surgery included billiary colic (52 patients), resolving or recently resolved episodes of cholangitis (6 patients) and recently resolved episodes of gallstone pancreatitis (2 patients).

Each patient underwent preoperative ultrasound examination (Toshiba JUST VISION-400). A note was made of the presence or absence of calculi, number of calculi, size of largest calculus, the degree of gall bladder contraction or distension, thickness of the gall bladder wall, the presence or absence of gall bladder tenderness, pericholecystic fluid collections, sloughed membranes, striated appearance to the gall bladder wall, and commom bile duct diameter. Patients with billiary colic underwent ultrasonographic examination during their initial surgical consultation.

On admission for surgery, a careful clinical history was taken, and patients were excluded if there was a change in symptomatology during the time interval between the ultrasound examination and surgery. Patients with resolving acute cholecystitis / pancreatitis/cholangitis were scanned in the days immediately prior to surgery.

On ultrasound examinations, gallstone bigger than 14 mm were considered likely to cause problems in removal. A gall bladder wall thickness of more than 3 mm was considered to be abnormal. Tenderness over the gall bladder was considered to be the evidence of acute inflammation.

Gall bladder contraction was defined as a transverse diameter less than 2 cm. A small contracted gall bladder was considered likely to represent chronic inflammatory changes. A common hepatic duct measurement of 8 mm or greater was considered to be abnormal. Laparoscopic cholecystectomies were performed by two surgeons in a standard fashion using four ports.

Postoperatively, a comparison was made of the ultrasound findings and the operative notes. The following informations were recorded: (1) uneventful, difficult, or failed laparoscopic surgery, (2) the cause of the intraoperative defficulties, and (3) reasons for conversion to open cholecystectomy.

RESULTS

Fourty five laparoscopic cholecystectomies were performed without difficulty. Seven laparoscopic cholecystectomies were successfully completed, but only after some intraoperative difficulties were experienced. Eight cases were converted to open cholecystectomy.

In 45 patients who had a successful laparoscopic cholecystectomy, the preoperative ultrasound examination indicated at least one calculus bigger than 14 mm. Only 1 of these cases presented minor problems; in that case, the stone required extention of paraumbilical hoe prior to removal. The remaining 44 patients presented no problems.The number and size of gallstones as estimated by ultrasonography did not contribute any useful information, and the following results do not include calculus size or number as a component of the ultrasound assessment.

Fifty two patients had laparoscopic cholecystectomy for billiary colic. Table 1 outlines the results in this group. There were 4 failed laparoscopic cholecystectomies; 2 of these were secondary to introgenic complications. In 1 patient, who was very obese, there was difficulty maintaining an adequate pneumoperitoneum and keeping the colon clear of the operative field. Two patients has thick-walled, contracted gall bladders that could not be removed laparoscopically. In both cases, these findings were seen in the preoperative ultrasound examination (Figure 1).

Of the 8 patients with technically difficult surgery, 3 had adhesions from previous surgery, 1 patient was very obese and also proved to have a

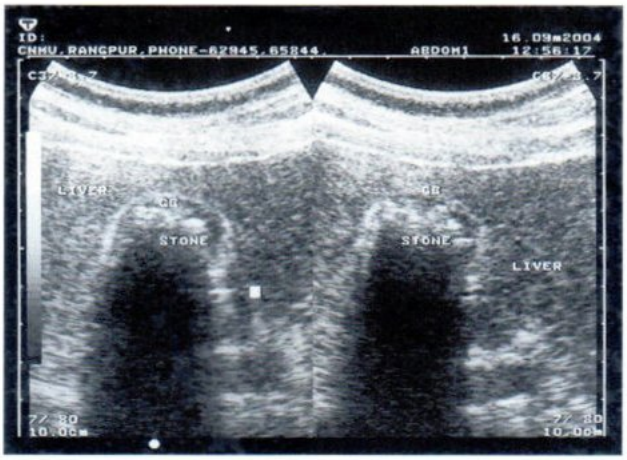

Fig 1

Table 1 Result of Laparoscopic Cholecystectomy in patient with Biliary Colic.

	Number of cases	Non GB related problem	Problematic GB Resection
Unsuccessful	04	02	02(2*)
Difficult	08	03	05(3*)
Uneventful	40(6)	--	--

* Preoperative ultrasonography diagnosed as potential problematic.

difficult arterial dissection, one patient had a very large calculus that required extention of para- umbilical hole prior to removal, and 5 patients had chronically inflamed gall bladders. The preoperative ultrasound examination in 3 of these last 5 cases showed thick -walled gall bladders, which were not tender on examination (Figure 2).

Forty patients had uneventful surgery, including 8 patients who had thick-walled gall bladder with or without gall bladder contraction in a preoperative ultrasound examination (Figure 3).

Six patients had laparoscopic surgery for resolving acute cholecystitis. Table 2 outlines the results in this group. Of the 2 unsuccessful cases, 1 had adhesions from previous surgery and another one had unexpectable inflamed gall bladders. All 2 patients had acutely inflamed gall bladders in the preoperative ultrasound examination, and 3 also had gall bladder wall thickening. A single case proved uneventful despite of the thick-walled appearance of the gall bladder in the preoperative ultrasound examination.

Two patients had resolved cholangitis. One had uneventful surgery and one was converted to open cholecystectomy. The reason for conversion was a combination of mechanical problems and difficult anatomic dissection. In both cases, the preoperative ultrasound examination was normal.

In the 2 patients with resolved pancreatitis, 1 had uneventful surgery and 1 was converted to open cholecystectomy because of severe inflammatory changes in the gall bladder. The preoperative ultra-

sound examination in both cases was entirely normal.

In 8 of the 40 uneventful laparoscopic cholecystectomies in the total study group, there was preoperative evidence of a thick-walled gall bladder with or without gall bladder contraction, yet these posed no problem at surgery. There were no ultrasound features that identified the unsuccessful, difficult, or uneventful laparoscopic cholecystectomies.

Fig 2

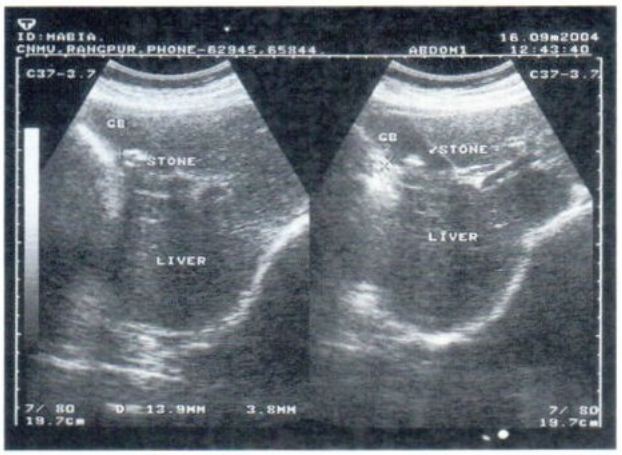

Fig 3

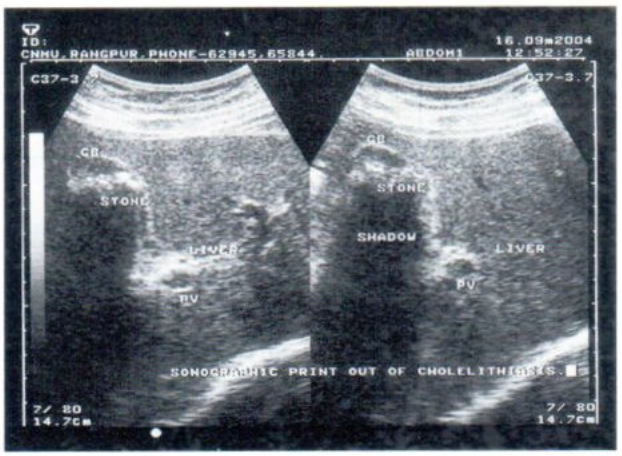

Fig 4

Table 2 Result of Laparocopic Cholecystectomy in patient with Recently Resolved Acute Cholecystitis.

	Number of cases	Non GB related Problem	Problematic GB Resection
Unsuccessful	4	1(1)*	3(3)
Difficult	1	--	1(0)
Uneventful	1(1)	--	--

* Preoperative ultrasonography diagnosed as potential problematic.

DISCUSSION

Most female had heard of laparoscopy, also known as Band-Aid or Bellybutton surgery. Gynaecologist have long used this technique to tie the fallopian tubes and to dissect the female reproductive organs. Now the use of laparoscopy has been expanded to include removing a diseased gall bladder.[4]

The main benefit of this procedure is the easy recovery for the patient. There is no incisional pain as occur with standard abdominal surgery. The patient is up and walking about, the same day. In fact, upto 90% of the patients go home the same day. The remainder are usually discharged the next day. And within several days, normal activities can be resumed. So the recovery time is much quicker. Also, there is no scar on the abdomen.[2]

In a recent review of the Canadian experience with 2201 laparoscopic cholecystectomies, there were 95 conversions to open cholecystectomy, giving an overall rate of conversion of 4.3%.[1] In those centers that had performed fewer than 100 laparoscopic cholecystectomies, the conversion rates were higher. In the most experience center, which had performed 679 procedures, the conversion rate was only 2.8%, and laparoscopic cholecystectomy was offered to all patients with symptomatic cholelithiasis. This overall conversion rate was similar to that found by Meyers[6] when he reviewed 1518 laparoscopic cholecystectomies.

In the study by Litwin et al,[1] acute and chronic inflammation of the gall bladder, aberrant anatomy, the need for ductal exploration, and one case of polycystic disease accounted for 34 of the 95 conversions. The remaining 61conversions resulted from adhesions, intraoperative complications, mechanical problems, and 1 case of small bowel obstruction.

These result suggest that preoperative ultrasound evaluation could reduce the overall conversion rate to approximately 3%.

In our study there were 8 conversions to open cholecystectomy (4 billiary colic, 2 acute cholecystitis, 2 pancreatitis) because of inflammatory changes in the gall bladder. The preoperative ultrasound examination detected either increased gall bladder wall thickness with or without gall bladder contraction.

In the 6 patients in whom gall bladder resection proved to be difficult, preoperative ultrasound, examinations demonstrated abnormalities other than cholelithiasis in 2 cases. However, in 8 of 45 uneventful cases, similar gall bladder findings were present. There was no objective difference in the abnormal ultrasound findings in uneventful, difficult, and failed cases.

None of the 6 patients with resolving acute cholelithiasis had evidence of gengrenous cholecytitis on either ultrasound assessment or examination of phological specimens. It seems probable that ultrasonic findings of pericholecystic fluid collections, sloughed membranes, or a striated appearance to the gall bladder wall would be associated with a difficult or failed laparoscopic cholecystectomy.

Intraoperative difficulties arose in only in case as a result of a large gallstone. The stone measured 2 cm and required extention of para-umbilical hole prior to removal. In another 32 patients, the preoperative ultrasound examination documented stones in excess of 14 mm, yet no operative difficulties arose. It is likely that in these patients we were measuring several small stones adjacent to each other and not a single calculus, or when a single calculus did measure in excess of 14 mm, its other dimensions allowed it to be easily removed.

This study was performed at the commencement of the laparoscopic cholecystectomy program at our hospital. One surgeon involved was relatively experienced, and, theoretically, preoperaive ultra-

sound examination should have been useful at this stage. It is anticipated that with increasing surgical experience many of the problems encountered in the difficult and failed cases will prove less troublesome in the future. This expected reduction in conversion rate will reduce further the value of detailed preoperative ultrasound assessment.

We anticipate that the majority of the patient will be offered to laparoscopic cholecystectomy, irrespective of the ultrasound appearance of a thickened gall bladder wall, contraction, or tenderness. The result of surgery will depend on the experience of the surgeon and will not be predictable by the preoperative ultrasound evaluation. Our findings are similar to those of Mcloughlin et al.[8]

CONCLUSION

Gall bladder removal by laparoscopic surgery is an exciting development because of it offers so much to the patient. The surgeons carefully evaluate each case and discuss it with the patients. While problems can occurs with the procedures they are unuseful. In most instances, patients experience excellent result and resume their normal activities very quickly. For successful removal of gall bladder by Laparoscopic surgery mostly depends on the expertise of the surgeon and appropriate patient selection depending upon the sonographic findings, that is detailed preoperative ultrasound assessment of the gall bladder, confirmation of presence of stone, size, number of stone, thickness of walls, as well as evaluation of others right quadrants organs an important to exclude significant pathology to outside the gall bladder.

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