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Difficult Cholecystectomy Strategies in Laparoscopic Cholecystectomy: A Study

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ABSTRACT

Background: In the beginning of era of laparoscopic cholecystectomy, only simple gall stone disease was thought to be amenable to laparoscopic cholecystectomy. With gaining experience, certain risk factors have been identified for predicting difficult cholecystectomy. These risk factors include dense adhesions, acute cholecystitis, contracted gall bladder, mucocele and empyema of gall bladder, male patients who are obese, diabetes, chronic liver diseases, cholecystoduodenal fistula and Mirrizzi's syndrome.

Material and methods: This study was carried out on a total of 114 patients suffering from gall stone disease. In all the patients four ports laproscopic cholecystectomy was done. The patients were assessed clinically for inflammation. The haematological investigations were done in all the patients. The preoperative ultrasound was done in these patients for pre operative assessment of diagnosis and assignment of a patient to difficult gall bladder. The standard four port technique was used for laparoscopic cholecystectomy.

Results: Out 114 patients, dense adhesions were present in 25 patients, contracted gall bladder in 24, acute cholecystitis in 9, obese male 3, diabetes 4, empyema and mucocele in 3 and 4 patients respectively.

Conclusion: Removal of gall bladder by laparoscopic method at times poses technical challenges due to various reasons, and at times non existing problems can be encountered but most of the problems can be safely managed with laparoscopy with minimal morbidity, safety should be given priority, to avoid complications and threshold for conversion should be kept low.

KEYWORDS :Difficult Cholecystectomy, Laparoscopic Cholecystectomy

Introduction:

Cholelithiasis is very common disease in northern part of the country. The laparoscopic cholecystectomy is the standard procedure for all types of gall stones. In the beginning of era of laparoscopic cholecystectomy, only simple gall stone disease was thought to be amenable to laparoscopic cholecystectomy. With gaining experience, certain risk factors have been identified for predicting difficult cholecystectomy. These risk factors include dense adhesions, acute cholecystitis, contracted gall bladder, mucocele and empyema of gall bladder, male patients who are obese, diabetes, chronic liver diseases, cholecystoduodenal fistula and Mirrizzi's syndrome.[1]

With the introduction of new generation of digital optical visualization techniques, rotatable hand instruments and use of new thermal sources any type of difficult gall stone disease can be operated by laproscopic cholecystectomy. The studies have shown that all types of difficult gall stone disease can be managed by laparoscopic cholecystectomy without increasing morbidity by predicting the risk score.[2] The definition of term "difficult laparoscopic cholecystectomy" is inconsistent. The term difficult cholecystectomy refers to multiple technical intraoperative difficulties that increases the risk of complications and significantly prolong s the operative time. Difficult laparoscopic cholecystectomy is related to an increased incidence of conversion to open cholecystectomy, probably because the more difficult the operation, greater the likelihood of conversion; although the level of difficulty may vary with skill and experience of the surgeon.[3] More-over, studies have shown that there is a higher incidence of post operative complications and longer hospital stay in converted patients when compared with both laparoscopic and the open cholecystectomy group.[4] This study was planned to study the use of various strategies in operating difficult cholecystectomy to avoid bile duct injuries and reduce conversion rate to open cholecystectomy.

Material and Methods:

This study was carried out on a total of 114 patients suffering from gall stone disease. In all the patients four ports laproscopic cholecystectomy was done. The patients were assessed clinically for inflammation. The haematological investigations were done in all the patients. The preoperative ultrasound was done in these patients for pre operative assessment of diagnosis and assignment of a patient to difficult gall bladder. Informed consent was obtained from all the patients. The patients suffering from carcinoma gall bladder were excluded from study.

In four ports technique, first port was 10 mm at umbilicus and was used for camera. The second 10 mm port was made at epigastrium just right lateral to falciform ligament. This port was used for dissection instrument and for delivery of gall bladder. Third port was 5 mm port made below right costal margin in midclavicular line. Another 5 mm fourth port was made under costal margin in anterior axillary line for fundal retraction.

Observations were made in regarding the condition of gall bladder, bleeding, perforation of gall bladder, bile spillage, stone spillage and bile duct injuries. The ease of dissection in calot's triangle was graded as mild, moderate and difficult. The operative time was recorded in both groups from creation of pneumoperitoneum to delivery of gall bladder. The conversion to open cholecystectomy was also noted.

Results:

Out of 114 patients, the description of various entities observed is given in table 1. The rest of patients no difficulty was observed. These patients are not kept under difficult cholecystectomy.

Table1. Operative Findings in Difficult Cholecystectomy

Clinical Entity	No.
Massive Adhesions	25
Contracted Gall Bladder	24
Empyema Gall Bladder	03
Mucocele Gall Bladder	06
Acute Cholecystitis	09
Gangrenous Cholecystitis	00
Cirrhosis of Liver	00
Obese Male	03
Diabetes	04
Cholecystoduodenal Fistula	00
Mirrizzi,s Syndrome	00

The following postoperative Complications were observed in this study.

Haemorrhage - 01
Bile Leak - 20
Bile Duct Injury - 01
Post Cholecystectomy Syndrome - 09

In following cases the conversion to open cholecystectomy has to be done in four patients.
Dense Adhesions - 01
Haemorrhage - 01
CBD exploration - 02

Although dense adhesions was the most common cause of difficult cholecystectomy but in all the cases except one laparoscopic cholecystectomy was done successfully. Bile spillage and stone spillage is the second most common cause in this series. Haemorrhage and bile duct injuries were observed in two patients. Both patients were converted to open cholecystectomy. Two patients had common bile duct injuries and were identified peropertively and repaired accordingly. Postoperative epigastric pain as post cholecystectomy syndrome was observed in nine patients only. None of these patients had residual calculi.

Discussion:

Laparoscopic cholecystectomy has become the procedure of choice for symptomatic gall stone disease. Many preoperative conditions have been identified in which difficulty in operation of laparoscopic cholecystectomy can be predicted. The conditions predicted to have difficult cholecystectomy are geriatric patients, male patient, obese patient, recurrent attacks of acute cholecystitis, thick wall gall bladder and contracted gall bladder.[5] The preoperative assessment of a difficult gall can be assessed using ultrasound.[6] Once a difficult gall bladder is seen laparoscopic cholecystectomy can be done taking precaution in identification of anatomical landmarks around calot's triangle. Dissection in safety triangle should also be done carefully.

In this series commonest cause of difficult laparoscopic cholecystectomy was inflammation due to acute cholecystitits mostly partially resolved which was once considered as a relative contraindication for laparoscopic surgery, but randomized studies have challenged this view. As experience with the procedure is increased and available equipment has improved, laparoscopic cholecystectomy has gained acceptance as a surgical treatment for inflamed gall bladder.[7] There is accumulating evidence in literature showing safety and benefits of early laparoscopic cholecystectomy. The conversion rate repeated in literature varies from 7 to 38% , but in our series the reported rate is only 4.1%. It has been suggested that the adhesions appearing after an abdominal operation lead to complication of trocar replacement and gall bladder dissection, thereby increasing the incidence of conversion in patients with history of previous abdominal operations. Lipman et al reported that adhesions related to post operations might be in different locations and adhesions near the gall bladder should not affect dissection; in addition adhesions that appear during acute cholecystitis are denser, thus previous upper abdominal operations do not increase the incidence of conversions.[8]

The analysis of review of literature for laparoscopic cholecystectomy in empyema of gall bladder has shown that this procedure was associated with less intra operative blood loss, shorter hospital stay, less wound infection and less post operative pain. However, significant technical difficulties due to edema, adhesion and distorted anatomy do occur and Conversion rate in this study was 5.0%, which is lower than what is reported in literature.[9,10] Out of 4 conversions two patients needed conversions due to bleeding and two had common bile duct injuries which were recognized per operatively and primary repair of the common bile duct was done in both cases. There was no case of cirrhosis or portal hypertension and Mirizzi's syndrome. Gall bladder polyp was present in two patients and these two patients did not pose any difficulty during laparoscopic cholecystectomy. There was no case of carcinoma gall bladder in this series. No consensus guidelines are available regarding technique of laparoscopic cholecystectomy in difficult gall bladder. In our opinion common bile duct injuries and conversion rate to open cholecystectomy can be reduced by using preoperative ultrasound, precautions in dissection particularly in calot's triangle, minimum use of electrocautery, fundus first technique and doing subtotal cholecystectomy.[11] In this study the conversion rate is significantly less as compared to other series.

Conclusion:

Removal of gall bladder by laparoscopic method at times poses technical challenges due to various reasons, and at times non existing problems can be encountered but most of the problems can be safely managed with laparoscopy with minimal morbidity, safety should be given priority, to avoid complications and threshold for conversion should be kept low. At the same time advanced skills in laparoscopic surgeries are essential for laparoscopic cholecystectomy in difficult situations with experience and laparoscopic cholecystectomy is made possible in certain situations which were considered impossible earlier. In a nutshell, essential points under consideration for performing safe difficult are essential feature for safe surgery laparoscopic cholecystectomy are: preoperative workup and identification of co-morbid conditions, meticulous dissection, minimal use of cautery and no inhibitions for conversion to open cholecystectomy.

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