

## Determinants of conversion of laparoscopic cholecystectomy to open cholecystectomy

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**Objective:** To determine the reasons for conversion of laparoscopic cholecystectomy to open cholecystectomy.

**Methodology:** This descriptive study was performed at department of Surgery, Chandka Medical College Teaching Hospital/Shahed Mohtarma Benazir Bhutto Medical University, Larkana, Pakistan from July 2011 to June 2016. All patients with gall stones, acute and chronic cholecystitis aged 15 years & above underwent laparoscopic cholecystectomy.

**Results:** Out of 1775 patients in this study, 1322(74.4%) were females and 453(25.6%) males. Age ranged from 22 to 65 years (mean  $44 \pm 13.7$ ). Out of 1775 patients, 35(1.97%) required conversion to open and among these,

24(1.81%) were females and 11(2.42%) were males ( $P = 0.3897$ ). The most common reason for conversion to open was dense adhesions due to cholecystitis in 9(0.50%) patients followed by obscure anatomy with severely inflamed gall bladder in 8(0.45%) patients, 6(0.33%) patients with empyema gall bladder, 5(0.28%) patients due to suspicion of bile duct injury, 4(0.22%) patients due to duodenal injury and 2(0.11%) with cholecysto-enteric fistula.

**Conclusion:** In this study, 2% patients required conversion to open and the frequent reasons were dense adhesions and obscure anatomy. (Rawal Med J 202;45:92-95).

**Keyword:** Laparoscopic cholecystectomy, conversion, chronic cholecystitis.

## INTRODUCTION

Laparoscopic cholecystectomy (LC) has emerged as the gold standard treatment for patients suffering from cholelithiasis. Advantages of LC over open cholecystectomy include less perioperative monitoring, less postoperative pain, shorter hospital stay, earlier return to usual activities, less surgical trauma, improved cosmesis, less wound infection, less pulmonary insult and lower cost.<sup>1</sup> With the passage of time, surgical experience and technical advancements have increased the indications for the laparoscopic approach to patients with acute cholecystitis and empyema gall bladder.<sup>2</sup>

There are numbers of patients who require conversion from LC to open cholecystectomy and conversion to an open procedure should not be considered a complication,<sup>3,4</sup> rather it is the decision of surgeon taken when he cannot clearly identify the important anatomical structures or there is injury to biliary system, which has been reported from 0.18% to 30%.<sup>5</sup> The reasons for conversion of LC to open include surgeon's experience, patient selection,

disease process and quality of equipment. Laparoscopic surgeon should ideally be trained in minimal invasive skill lab initially and then under the supervision of trained laparoscopic surgeon so as to decrease the subsequent conversion rate.<sup>6</sup> The aim of our study is to determine the reasons for conversion from LC to open cholecystectomy in our setting.

## METHODOLOGY

This descriptive case series study was conducted in the department of Surgery, Chandka Medical College Teaching Hospital, Larkana from July 2013 to June 2018. Approval of study from ethical committee of college was taken and an informed written consent was taken from all patients. All patients with symptomatic or asymptomatic gall stones, acute or chronic cholecystitis and patients of age 15 years and above were included in the study. Those patients diagnosed as chronic liver disease with ascites and significant portal hypertension, jaundiced patients, those with uncontrollable

coagulopathy, patients with carcinoma of gall bladder diagnosed on ultrasound and or CT scan, patients having dilated CBD with or without stone and those patients with previous multiple abdominal surgeries were excluded from the study.

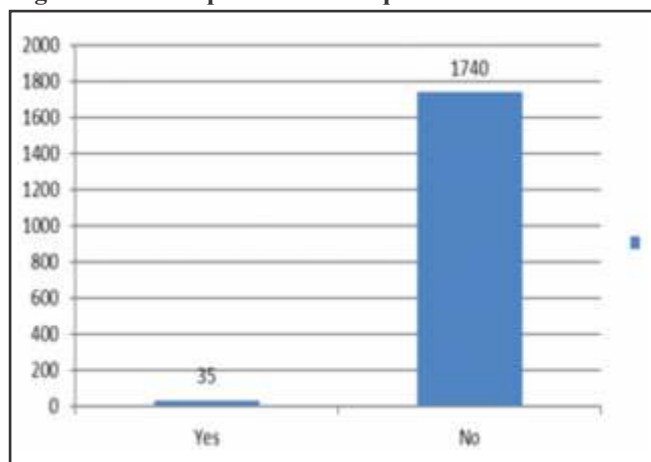
The demographic data of patients, mode of admission, elective or emergency, detailed history with clinical examination, laboratory and other investigations for diagnosis and fitness of patient for anesthesia & surgery were recorded. The indication for cholecystectomy, concomitant co-morbidity like diabetes mellitus, hypertension, myocardial ischemia or previous infarction, obesity, pulmonary and other such problems were also recorded.

In all patients, four standard ports were used and pneumoperitoneum was created with Hasson's technique, Calot's triangle was exposed to identify cystic artery and cystic duct which were clipped separately. Monopolar diathermy was used for separating the gall bladder from liver bed and gall bladder removed through umbilical port in a preformed bag made from gloves. Drain tube kept in selected cases like acute cholecystitis, empyema gall bladder and edema of tissues. Third generation cephalosporin antibiotic was used for prophylaxis. Most of the uncomplicated patients were discharged on first postoperative day. Statistical analysis was done on SPSS version 17.

## RESULTS

A total 1775 patients were included in our study; 1322(74.4%) were females and 453(25.6%) were males giving a female and male ratio of 3:1. Age of patients was from 22 to 65 years with mean age of  $44 \pm 13.7$  and majority were below the age of 42 years. The clinical presentations of were biliary colic in 930(52.39%), cholecystitis in 860(48.45%) and chronic dyspepsia in 690 (38.8%) patients. Ultrasonography suggested thick walled gall bladder containing pus echo (empyema) in 460(25.91%) and pericholic fluid collection in 110(6.19%) patients. Out of 1775 patients, 470 (26.47%) presented with acute cholecystitis on clinical & ultrasonic finding with 35.32% male and 23.44% female patients.

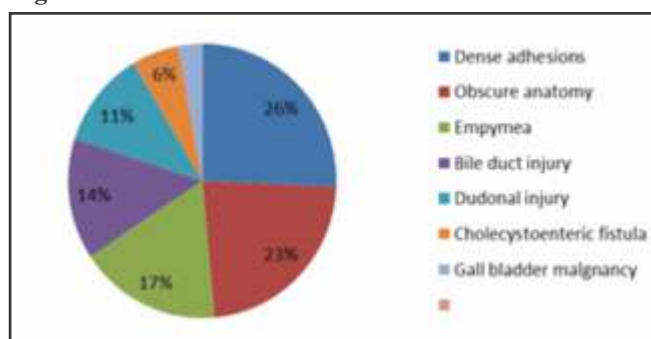
**Fig. 1. Number of patients who required conversion.**



**Table. Gender of patient who underwent Conversion**

Gender	Conversion		Total
	Yes	No	
Male	11	442	453
Female	24	1298	1322
Total	35	1740	1775

**Fig. 2. Reasons for conversion.**



Out of 1775 patients, 35(1.97%) required conversion to open cholecystectomy (Fig. 1). Among these, 24/1322 (1.81%) were females and 11/453 (2.42%) were males ( $P=0.3897$ ) (Table). The most common reason for conversion was dense adhesions due to cholecystitis in 09/1775 (0.50%) patients and obscure anatomy with severely inflamed gall bladder (Fig. 2).

## DISCUSSION

Laparoscopic cholecystectomy is associated with early recovery and low morbidity.<sup>7</sup> The rate of conversion is associated with different factors like,

the exposure of surgeon with LC, the degree of difficulty found during surgery and other reasons like past history of upper abdominal operation, repeated episodes of acute cholecystitis, old age and male gender.<sup>8</sup> The conversion causes significant change in outcome because of late recovery and longer hospital stay.<sup>9</sup> Conversion rate ranges from 2.6% to 7.7%.<sup>9-11</sup> In our study, rate was 1.97%.

A previous history of acute cholecystitis which causes dense adhesions and male gender are the most frequent situations, carrying an increased operative risk and the reason for conversion,<sup>12</sup> and also seen in our study. In our study, 470 patients with acute cholecystitis were successfully managed laparoscopically. Only nine patients were converted to open due to severely inflamed gall bladder and dense adhesions.

We had 310 patients with obscure anatomy and unclear Calot's triangle, out of which 302 patients were managed successful by delineation of Calot's triangle with blunt and careful dissection, suction and irrigations and LC was performed successfully.

Common bile duct injury occurred in nine patients, out of which four patients had minor rent, which was repaired and conversion was required in five patients with insertion of T tube. Many methods were used to prevent common bile duct injury like lateral retraction of infundibulum, precise identification of cyst duct junction with gall bladder, however, the incidence of bile duct injuries has not decreased.<sup>14</sup> The reasons for this are unclear, although it is possible that the critical view of safety is either not routinely used or applied incorrectly. In eight patients cholecysto-enteric fistula was noted, six managed laparoscopically and two required conversion. One patient required conversion due to suspicion of malignancy.

Wide cystic duct could be a cause of conversion, but in this study no conversion was required. In case of wide cystic duct with suspicion of stone, the clip was applied proximally then the duct opened partially and stone removed by milking the cystic duct from the partial cut area. Cystic artery bleeding or bleeding from liver bed has been reported as a cause for conversion.<sup>15</sup> In our study, there was no conversion due to bleeding as we managed it by means of compression with gauze piece and then

applying the spongstone or sometimes the bleeding point was caught and then clip was applied proximally. Spillage of stones and instrument/quipment failure could be a cause of conversion,<sup>15</sup> but no conversion was required in our study.

## CONCLUSION

During Laparoscopic cholecystectomy, about 2% patients required conversion to open. The most frequent factors responsible for conversion were dense adhesions and obscure anatomy.

### Author contribution:

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Analysis and interpretation of the data: Aijaz Ahmed Memon, Saeed Ahmed Shaikh

Drafting of the article: Abdul Ghani Shaikh, Aijaz Ahmed Memon  
Critical revision of the article for important intellectual content: Aijaz Ahmed Memon

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