Reasons and Morbidity of Conversions in Laparoscopic Cholecystectomy

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ABSTRACT	
Objective	To identify variables and morbidity that lead to conversion to open surgery in laparoscopic cholecystectomy (LC) patients.
Study design	Descriptive case series.
Place & Duration of study	Surgical Department of Liaquat University Hospital Jamshoro, from June 2005 to May 2008.
Methodology	All patients with symptomatic cholelithiasis were included. Patients with previous abdominal surgery, gall stone cholangitis and pancreatitis were excluded.
Results	A total of 619 patients (68 males and 551 females) underwent laparoscopic cholecystectomy. Forty (6.46%) patients were converted to open surgery. Regarding preoperative variables males had higher conversion rate of 72.5 %($p < 0.0001$). Mean age of the converted group was 55.2 +2.5 year and mean age of laparoscopic group was 42.6 + 3.8 year ($p 0.0003$). Conversion was more in patients with acute cholecystitis (p value <0.0001). Obscured anatomy of Calot's triangle (45%) and equipment failure (15%) were major reasons for conversion. Operative complications leading to conversion were bile duct injury (5%), haemorrhage (7.5%), duodenal injury (1%), colonic injury (1%) and common bile duct stones (5%). Patients in conversion group had higher rate of postoperative morbidity. This included wound infection (10.0%), fever (12.5%), bile leakage (5%) and intra abdominal collection (5%). It increased the hospital stay to 4.3 + 0.3 days which for the laparoscopic group was 1.6 + 0.1 day (p <0.0001).
Conclusion	Possibility of conversion can be predicted pre-operatively with variables like male gender, old age, acute cholecystitis and during surgery by obscured anatomy at Calot's triangle.
Key words	Laparoscopy, Cholecystectomy, Conversion.

INTRODUCTION:

Laparoscopic cholecystectomy has become a standard of care in gall bladder pathologies. Many advantages of laparoscopic intervention have been reported in literature.¹⁻³ Although laparoscopic cholecystectomy is attempted in majority of the cases but at times conversion to open procedure is needed.⁴ Conversion to open cholecystectomy does not mean complication or failure but an effort to stay away from difficult situations. It is always advised to

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Dr. Shahida Khatoon Department of Surgery Liaquat University Hospital, Jamshoro E mail: kdrshahida@yahoo.com determine the risk of conversion in initial stage and is also necessary for the patients to know about its possible necessity. Such forecast may be helpful for a surgeon to switch from laparoscopic cholecystectomy to open, at an earlier stage. Although it is not easy to say accurately which laparoscopic cholecystectomy will be difficult but one can assess the likely reasons. This study was conducted to identify variables that may help surgeons for possible conversion to open surgery preoperatively.

METHODOLOGY:

This case series was based upon cases managed at Surgical Department of Liaquat University Hospital Jamshoro, from June 2005 to May 2008. Patients who underwent LC for symptomatic gallstones were included. Patients having history of any previous abdominal surgery, with systemic diseases, gall stone cholangitis and pancreatitis were excluded. Baseline investigations including biochemical assessment of liver and ultrasound abdomen were requested. Data including history and physical examination, operative procedure details and histopathology reports were recorded. Patients in whom conversion to open surgery was done were assessed again for indications, intraoperative and postoperative complications.

Data were analyzed in statistical program SPSS version 16.0. Qualitative data such as gender, cholecystitis, and reasons were presented as number and percentage, and Chi square test was applied to compare the proportions between laparoscopic cholecystectomy and conversions groups. Numerical variables like age, were presented as mean + standard deviation and Student t test was applied to compare the means between the groups. All the data were calculated on 95% Confidence Interval. P value < 0.05 was considered significant.

RESULTS:

Among the total of 619 laparoscopic cholycystectomy procedures, 68 (11.0%) were males and 551(89.0%) females. A total of 40(6.46%) patients required conversion to open cholecystectomy. Frequency of female patients was higher for cholelithiasis but males had higher conversion rate. Out of 40 patients 29 (72.5%) were males and 11 (27.5%) females (p < 0.0001) as shown in table I. Acute cholecystitis was present in 58(9.4%) and chronic cholecystitis in 561(90.6%) patients. Out of 58 patients of acute cholecycytitis, 12 (30%) were converted to open surgery (p < 0.0001).

Patients in converted groups were of older age with mean age of 55.2+ 2.5 year (p 0.0003) while mean age of laparoscopic group was 42.6 + 3.8 year. The most common reason for conversion was the

obscured anatomy at Calot' s triangle. This was noted in 18(45%) cases possibly due to adhesions or fibrosis caused by repeated inflammation. Operative complications which lead to conversion were bile duct injury in 2(5%), both identified during surgery and managed by T-tube drainage. Intraoperative haemorrhage occurred in 3(7.5%) patients, one from cystic artery and two from gall bladder bed (table II).

Post operative wound infection occurred in 4(10%), fever in 5 (12.5%) and bile leakage in 2(5%) cases. All the complications were managed non operatively. This resulted in longer hospital stay of 4.3 ± 0.3 days in converted group while in laparoscopic group it was 1.6±0.1 days (p 0.0001). There was no mortality in this series (table III).

DISCUSSION:

Despite the improvement and advancement in laparoscopic technology and increasing experience of laparoscopic surgery, there is still high conversion rate. Conversion rate in present study was 6.46% which is similar to reported literature of 1.5-19%.⁵ Regarding patient related factors it was observed that males (72.5%) and elder patients had higher risk of conversion which may be due to recurrent attacks of cholecystitis resulting in fibrosis. These observations are in agreement to other studies.^{2,6,7,8} Altered anatomy of Calot's triangle was the leading factor for conversion in this study which is also reported by others.^{5,9,10} Hence it supports the fact that identification of anatomical structures and Calot's triangle are crucial before clipping and cutting of cystic duct and artery.

Equipment failure had significantly contributed in conversion rate in present study (6 out of 40). Same has been reported in other national level studies. This was not a significant reason in other international studies where it is reported to occur in about 1% cases.^{11,12} Thus emphasis is on need of having functional equipments in operation theaters

Table I: Demographic and Clinical Variables								
	Laparoscopic Cholecystecomy n = 579	Conversions n = 40	Total	P value				
Gender: Male Female	39 (6.7%) 540 (93.3%)	29 (72.5%) 11 (27.5%)	68(11.0%) 551(89.0%)	< 0.0001				
Age +SD(in year)	42.6+3.8	55.2+2.5	43.56+9.5	0.0003				
Acute Cholecystitis	46(7.9%)	12 (30.0%)	58 (9.4%)	< 0.0001				

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Table I: Reasons of Conversion (n = 40)						
iency Percentage						
8 45.0						
2 5.0						
2 5.0						
1 2.5						
1 2.5						
2 5.0						
1 2.5						
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1 2.5						
1 2.5						
1 2.5						
2 5.0						
6 15.0						

Table III: Morbidity and hospital stay in converted and laparoscopic groups (n = 619)							
	Laparoscopic Cholecystecomy n = 579	Conversions n = 40	Total	P value			
Wound infection	6 (1.0%)	4(10.0%)	10 (1.61%)	0.002			
Postoperative fever	9 (1.5%)	5(12.5%)	14 (2.26%)	0.001			
Bile leakage	6 (1.0%)	2(5.0%)	8 (1.29%)	0.08			
Intra-abdominal collection	4 (0.6%)	2(5.0%)	6 (0.96%)	0.05			
Hospital stay +SD(in days),	1.6+0.1	4.3+0.3	3.2+0.6	< 0.0001			
Range	(1 – 3 days)	(3 to 10 days)	(1 – 10 days)				

with back up support. In the early days of laparoscopy, acute cholecystitis was considered as a contraindication but now it is well accepted in acute cholecystitis, though there is more chances of conversion to open surgery. In a study by Merdad AM, it was observed that acute cholecystitis had five times more risk of conversion than in non acute cases.^{13,14} During this study it was observed that intraoperative haemorrhage and common bile duct injury were reasons for conversion. Ercan M and Ishizaki Y observed that these two factors had major contribution in emergency conversion in their studies.^{12,15}

Postoperative morbidity was higher in converted group in our study. This resulted in prolonged hospital stay. This has bearing on cost effectiveness. Alponat M has observed a clear difference in wound infection (0.8% versus 7%) and lung infection (0.4% versus 3%) in laparoscopic and converted groups.⁵ Ghnnam

W had also observed longer hospital stay of 5.9 days in converted group and 1.4 day in laparoscopic group.⁷

CONCLUSIONS:

Conversion of laparoscopic cholecystectomy to open cholecystectomy may be lifesaving in difficult situation. Conversion rates can be reduced by identifying factors like male gender, elderly patients, acute cholecystitis and obscured anatomy of Calot's triangle as borne out by present study.

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