

ORIGINAL ARTICLE

Study of efficacy of achievement of critical view of safety in laparoscopic cholecystectomy in avoiding the occurrence of bile duct injury

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ABSTRACT:

Background: Laparoscopic surgery has induced a tremendous revolution in the treatment of gallbladder disease. Direction of traction on gall bladder can lead to misidentification of common bile duct (CBD) as cystic duct contributing to CBD injury. Over the past few decades, surgeons have spent considerable amount of time developing a safe way of Calot's triangle dissection and cystic duct identification. The present study was carried out on the patient planned for laparoscopic cholecystectomy with CVS approach. **Materials & methods:** 100 consecutive patients of gallbladder disease was included in the study. Patients were admitted a day prior to surgery in case of elective cholecystectomy from outpatient department (OPD) after complete investigations. Some patients were admitted from emergency with acute cholecystitis. Standard four port method of performing lap cholecystectomy was used. Dissection of calot's triangle from both its dorsal and ventral aspects was performed using both blunt and electrocautry dissection. All of the above procedures for the dissection were maintained above the line between the epigastric port and Rouviere's sulcus. Data was analysed statistically. **Results:** Aberrant anatomy was found to be present in 1 percent of the patients. Spillage was found to be present in 22 percent of the patients, while it was absent in 78 percent of the patients. Critical view of safety was achieved in 100 percent of the patients of the present study. **Conclusion:** The critical view of safety method of ductal identification is an effective approach according to the best evidence that exists to minimize the risk of bile duct injury (BDI) during LC.

Key words: Bile duct injury, Critical view of safety

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INTRODUCTION

Diseases of the gallbladder commonly manifest as gallstones, gallbladder inflammatory conditions and gallbladder cancer. Laparoscopic surgery has induced a tremendous revolution in the treatment of gallbladder disease. Laparoscopic cholecystectomy has emerged over the open cholecystectomy as the gold standard for surgical treatment of symptomatic gall stones. Misperception of intraoperative anatomy structures during cholecystectomy is one of the most important causes of bile duct injuries.¹⁻³ 70%-80% of bile duct injuries are due to misidentification of biliary anatomy. Direction of traction on gall bladder can lead to misidentification of CBD as cystic duct contributing to CBD injury. Over the past few decades, surgeons have spent considerable amount of time developing a safe way of Calot's triangle dissection and cystic duct identification. As a result, several different methods have been described regarding the CD dissection. These techniques include the infundibular approach, "fundus-

down" method, intraoperative cholangiography (IOC), and "critical view of safety (CVS)" technique.⁴⁻⁶ The present study was carried out on the patient planned for laparoscopic cholecystectomy with CVS approach.

MATERIALS & METHODS

The present study was conducted in the department of general surgery of the medical institute and it included assessment of efficacy of laparoscopic cholecystectomy with CVS approach. Ethical approval as obtained from institutional ethical committee and written consent was obtained from all the patients after explaining in detail the entire research protocol. 100 consecutive patients of gallbladder disease was included in the study. Patients were admitted a day prior to surgery in case of elective cholecystectomy from outpatient department (OPD) after complete investigations. Some patients were admitted from emergency with acute cholecystitis. These patients were investigated for the same. Investigations include: routine blood examination, X-

ray, Ecg, Ultrasound of abdomen etc. Standard four port method of performing lap cholecystectomy was used. Dissection of calot’s triangle from both its dorsal and ventral aspects was performed using both blunt and electrocautry dissection. All of the above procedures for the dissection were maintained above the line between the epigastric port and Rouviere’s sulcus. Data was analysed statistically. All the results were assessed by SPSS Software. Chi- square test and Mann-Whitney U test were used for assessment of level of significance. P- value of less than 0.05 was taken as significant.

RESULTS

52 percent of the patients belonged to the age group of 41 to 60 years. Mean age of the patients of the present study was 46.8 years. Aberrant anatomy was found to be present in 1 percent of the patients. Spillage was found to be present in 22 percent of the patients, while it was absent in 78 percent of the patients. Critical view of safety was achieved in 100 percent of the patients of the present study.

Table 1: Distribution of subjects according to age group

Age-group (years)	Frequency	Percentage
18- 30	20	20
31- 40	14	14
41- 50	38	38
51- 60	14	14
61 and above	14	14
Total	100	100
Mean age (years) ± SD=	46.8 years ± 14.8	

Table 2: Distribution of patients according to aberrant anatomy

Aberrant anatomy	Frequency	Percentage
Yes	1	1
No	99	99
Total	100	100

Table 3: Distribution of patients according to presence of spillage

Spillage	Frequency	Percentage
Present	22	22
Absent	78	78
Total	100	100

Table 4: Achievement of Critical View of safety

Critical view of safety	Frequency	Percentage
Achieved	100	100
Total	100	100

DISCUSSION

Many approaches has been given till now to prevent bile duct injury. All these methods and guidelines are important but still do not emphasize the key issue of misidentification that results in failure to conclusively identify the cystic duct structure before its division. One of approach is critical view of safety given by Strasberg . Strasberg identified an error trap to avoid, regarding the infundibular technique, in which the common hepatic duct might be mistaken for the gallbladder wall in severe inflammation. Strasberg suggested that no clipping or cutting should be done until the Calot’s triangle is cleared from all fat to visualized only two structures: the cystic artery and duct. Many surgeons adapted this technique and give good results regarding target identification and prevention of bile duct injury.⁶⁻⁸

In the present study, 52 percent of the patients belonged to the age group of 41 to 60 years. Mean age of the patients of the present study was 46.8 years. Aberrant anatomy was found to be present in 1 percent of the patients. Heistermann HP1 et al reported their experiences of applying the "critical view of safety", defined as unambiguous identification of the cystic duct and artery by creation of an infundibular window, in order to minimize bile duct lesions and conversion rate. 100 consecutive laparoscopic cholecystectomies using critical view of safety were prospectively investigated. Purpose of study was to determine how often it was possible to attain critical view of safety and demonstrate it with photo documentation. Even with high incidence of acute cholecystitis and previous surgeries, 97 out of 100 cholecystectomies were completed with photo documentation of critical view of safety. Only one cystic duct stump leak case was reported. The study concluded that "critical view of safety" represented an objective, understandable and compulsory criterion for minimizing the risk of iatrogenic injuries of the bile duct and decision on conversion to open cholecystectomy.⁹ Yegiyants S et al determined whether routine use of the CVS technique reduced the observed/expected single-institution rate of major BDI over a 5-year period in a teaching hospital. All patients (n = 3042) who underwent LC for any indication over a 60-month period were identified by database search. One patient sustained a transection-excision of the common duct requiring hepaticoduodenostomy. Based on published data, the observed BDI rate was one in nine to one in 15 of the expected rate. This represents an order-of-magnitude of improvement in the safety of LC at a single institution where the majority of cases were performed by residents. They suggested that the "critical view" technique should be widely adopted.¹⁰

In the present study, Spillage was found to be present in 22 percent of the patients, while it was absent in 78 percent of the patients. Critical view of safety was

achieved in 100 percent of the patients of the present study. Almutairi AF et al presented a new safe triangle of dissection. 501 patients under went LC in the following approach; The cystic artery is identified and mobilized from the gall bladder (GB) medial wall down towards the cystic duct which would simultaneously divide the medial GB peritoneal attachment. This is then followed by dividing the lateral peritoneal attachment. The GB will be unfolded and the borders of the triangle of safety (TST) are achieved: cystic artery medially, cystic duct laterally and the gallbladder wall superiorly. The floor of the triangle is then divided to delineate both cystic duct and artery in an area relatively far from CBD. There were little significant immediate or delayed complications. The mean operating time was 68 minutes, nearly equivalent to the conventional method. Dissection at TST appears to be a safe procedure which clearly demonstrates the cystic duct and may help to reduce the CBD injuries.¹¹

CONCLUSION

The critical view of safety method of ductal identification is an effective approach according to the best evidence that exists to minimize the risk of BDI during LC.

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