

How to Minimise Bile Duct Injury in Laparoscopic Cholecystectomy

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ABSTRACT

Background: Most commonly used technique for laparoscopic cholecystectomy i.e., Infundibular technique allows for circumferential dissection of cystic duct and gall bladder junction which creates a flaring tunnel shape.

Aim: To evaluate CVS(critical View of safety)in laparoscopic cholecystectomy.

Place: Aadil Hospital and Avicenna Medical College and Hospital Bedian Road Lahore.

Methods: A retrospective analysis of a 2 year practice in our surgical unit has been conducted. We routinely practiced CVS cholecystectomy. Patients having previous abdominal surgery, recurrent chronic disease, possible bile duct stones and liver disease were excluded.

Results: There were total of 120 patients in this study. 81(67.5%) females and 39 (32.5%) males who had surgery following CVS technique. 34 (28.3%) had acute/chronic cholecystitis or dense adhesions.

Conclusion: CVS should be achieved before applying clips. In case of difficulty in achieving the desired objective one should consider cholangiography or conversion to open cholecystectomy.

Keywords: CVS critical view of safety, Calot's Triangle.

INTRODUCTION

The preferred procedure today for gall stone disease since 1992 is laparoscopic cholecystectomy. The benefits to patient include reduced pain, early return to work and reduced wound infection rate compared to open cholecystectomy. Injury to bile duct has increased since laparoscopic cholecystectomy was introduced. It occurs in about 3 per 1000 procedures performed. It can be devastating and can have serious long term morbidity with life changing complications^{2,3}.

While performing operation one should be aware of the anatomical variations like short cystic duct and right hepatic artery loop over the infundibulum. Strasberg et al⁴ in the early nineties, stressed how a CVS should be achieved every time during laparoscopic cholecystectomy. This is done by dissecting the entire infundibulum off the liver bed and by freeing it of all fatty tissue on both its medial and lateral aspects so that you can clearly identify the cystic artery and the duct. In his opinion, would prevent accidental biliary and vascular injuries, due to uncommon variations, bleeding control under poor vision, or unclear anatomy.

Most commonly used technique for laparoscopic cholecystectomy i.e., Infundibular technique allows for circumferential dissection of cystic duct and gall bladder junction which creates a flaring tunnel shape. In situations where inflammation has occurred this

can pull common bile duct on gall bladder creating similar flaring tunnel shape resulting in common bile duct mistaken for cystic duct resulting in classic injury⁶.

The aim of this study is to highlight the infundibular technique as a contributing factor and whether by adopting "CVS technique" this can be avoided¹⁷.

METHODS

A retrospective analysis of a 2 year practice in our surgical unit has been conducted. Among a pool of "laparoscopic surgeons" equally acquainted with basic laparoscopy. We routinely practiced CVS cholecystectomy in our surgical unit 1 at Avicenna Medical College and Hospital and Aadil hospital. Our Surgical unit had a case mix between cholelithiasis, chronic cholecystitis, and acute cholecystitis and gall stone pancreatitis. Patients where operation was expected to be complicated were excluded like previous abdominal surgery, recurrent chronic disease, possible bile duct stones and liver disease. Operative technique was standard and the trocar position was 4-port French scheme. In all cases CVS was achieved.

The technique used⁵ in obtaining CVS is cephalad traction of the fundus by the grasper, together with a lateral traction of the infundibulum by second grasper. A complete incision of the serosa is performed around the infundibulum. Calot's triangle is identified and dissected so as to see the liver surface

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through this triangle. Clipping of the artery and the duct next to the gall bladder followed by gall bladder removal completes the operation.

RESULTS

There were total of 120 patients in this study. 81 (67.5%) females and 39(32.5%) males who had surgery following CVS technique. 34(28.3%) had acute/chronic cholecystitis or dense adhesions. In 2 patients cystic duct was short and dissection was carried out to the junction of the cystic and CBD before clipping. There were no biliary complications. Wound infection was seen in 5(4.1%) patients. No mortalities occurred. 2patients had intraoperative haemorrhage, immediately controlled with further application of clips, and 1 patient had bile in drain which dried on 3 postoperative day and drain was removed. Intraoperative cholangiography was not performed in any patient.

Incidence of Intraoperative complications:

Intraoperative complications	n	Incidence
Severe Adhesions	34	28.33
Short Cystic Duct	2	1.67
Intraoperative Haemorrhage	2	1.67
Uneventful Intraoperative course	82	68.33

Incidence of Postoperative complications:

Postoperative Complications	n	Incidence
Wound infection	5	4.17
Bile in drain	1	0.83
Uneventful postop course	114	95.00

Division of participants by gender

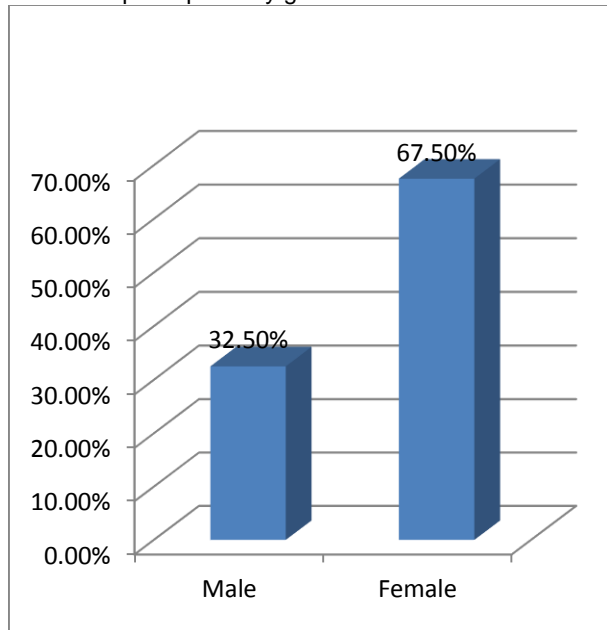
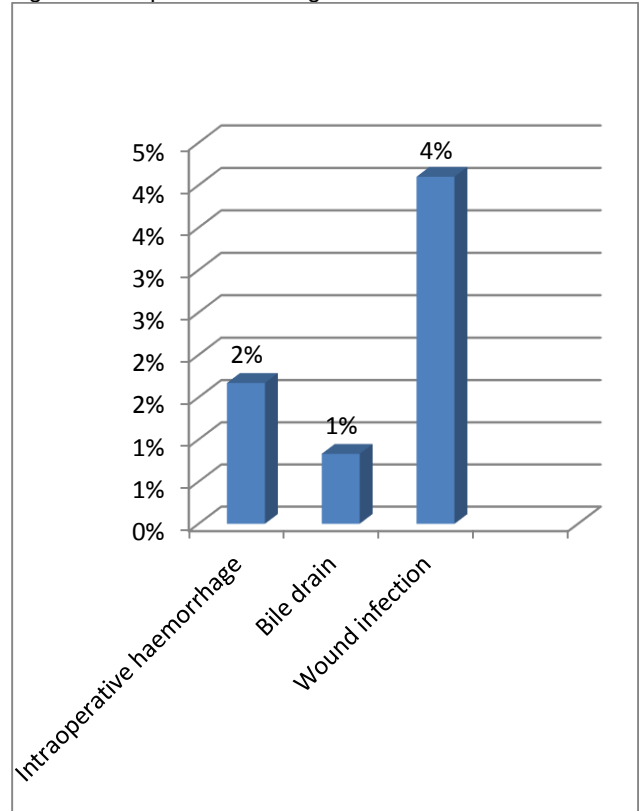
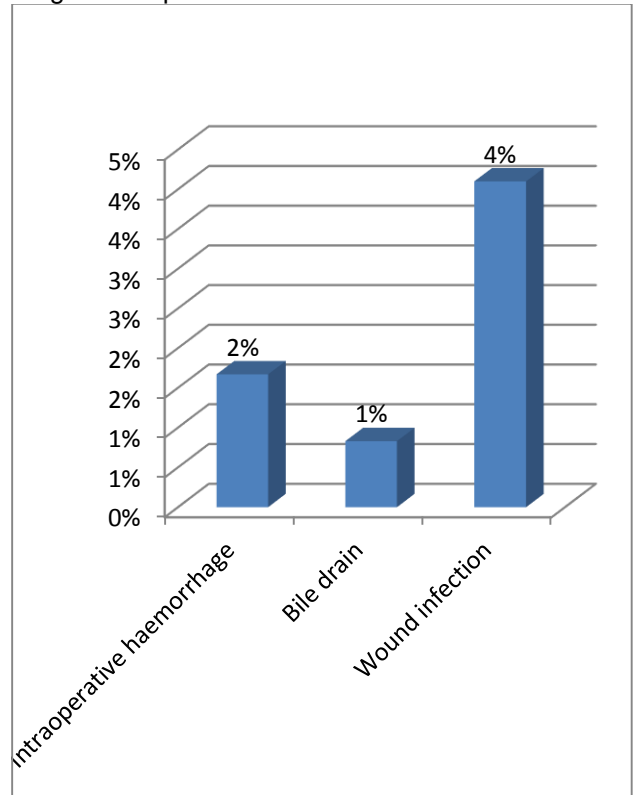


Fig. 1: Intraoperative Findings

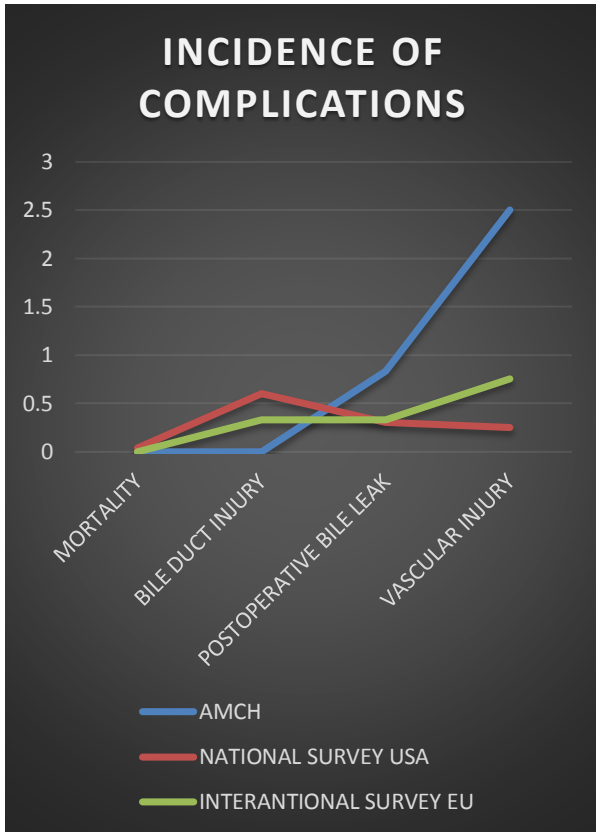


Surgical complications

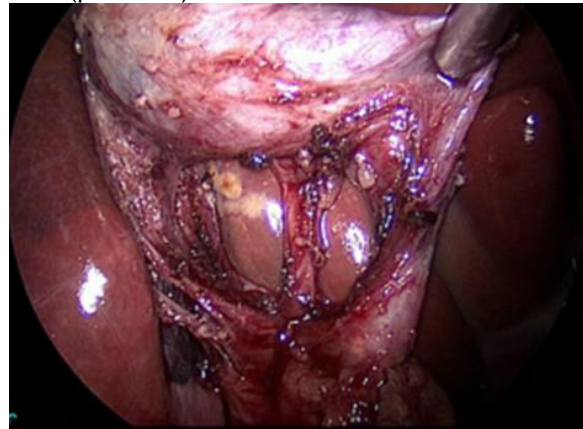


Brief comparison of incidence of complications with laparoscopic cholecystectomy national surveys in the U.S.A. and E.U.

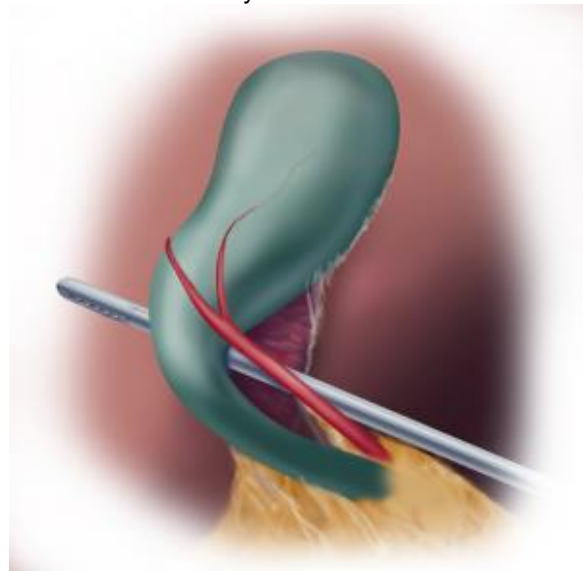
Complication	AMCH	National survey USA	International survey EU
Mortality	0	0.04	0
Bile duct injury	0	0.6	0.33
Postoperative bile leak	0.83	0.3	0.33
Vascular injury	2.5	0.25	0.75



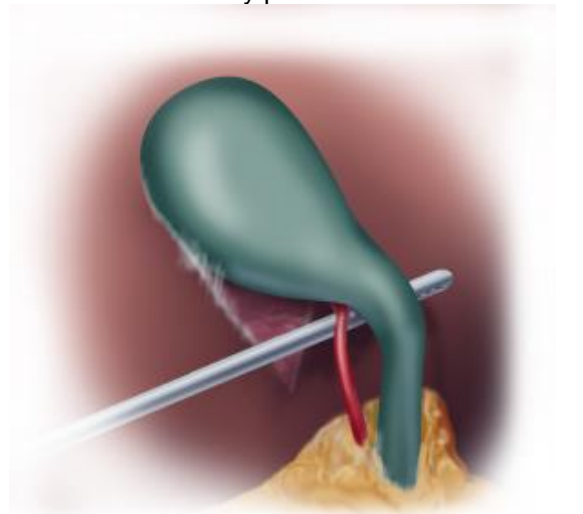
CVS (posterior)



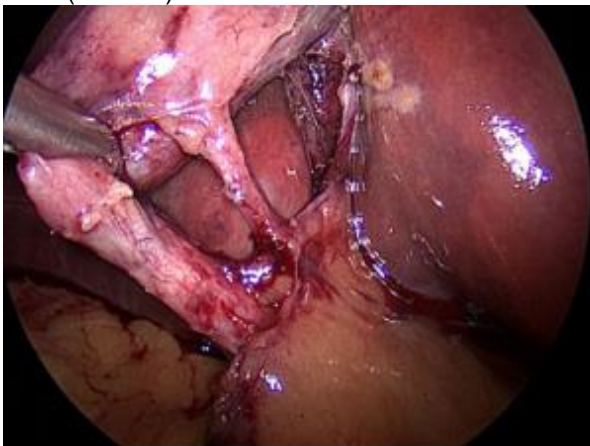
Critical view of safety anterior view



Critical view of safety posterior view



CVS (anterior)



DISCUSSION

CBD injury is still a major concern after many years passing since the first laparoscopic cholecystectomy was attempted. Three main techniques have been standardized. The oldest and most common approach is the infundibular one. The classic dissection of Calot's triangle might misrepresent vascular or biliary anatomical variants, which are frequently located in the medial part of the area.

To standardize an approach to the cystic artery and duct that could effectively avoid the area where ductal and arterial anomalies are likely to be encountered brought Strasberg et al 4 to outline the "critical view of safety." Since 1995, their suggestion has been little mentioned, until the initial papers and retrospective series started analysing the results of the technique.

Young surgeons and trainees are at risk of causing major injury under emergency conditions (intraoperative bleeding, severe inflammation and difficult anatomy) and this technique is of paramount importance for a safe procedure. We believe that this practical technique is desirable in training and district hospitals, or anyplace where laparoscopic experience is basic or limited to standard operations¹⁵.

CONCLUSION

CVS should be achieved before applying clips. In case of difficulty in achieving the desired objective one should consider cholangiography or conversion to open cholecystectomy.

The results of CVS in the literature and in our present study suggest CVS approach as gold standard in the dissection of the gallbladder elements to prevent iatrogenic bile duct injuries.

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