



Evaluation of critical view of safety in laparoscopic cholecystectomy

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ABSTRACT

Background: Laparoscopic cholecystectomy (LC) is considered a gold standard surgery for benign diseases of the gallbladder. The present study was conducted to assess critical view of safety during laparoscopic cholecystectomy.

Materials & Methods: 50 laparoscopic cholecystectomy patients of both genders were divided into 2 groups. Each group comprised of 25 patients. In group I, critical view safety (CVS) cholecystectomy, and in group II, classic infundibular (IN) technique was followed. Parameters such as operative time, Nasser grade and complications etc. was recorded.

Results: Group I had 15 males and 10 females and group II had 12 males and 13 females. The mean operative time was 52.4 mins in group I and 68.4 mins in group II. Nasser grade 1 was seen in 8 and 10, grade 2 in 9 and 8, grade 3 in 7 and 5 and grade 4 in 1 and 2 respectively. Complications were bleeding seen in 1 in group I and 2 in group II, bile leak 1 in group II. The difference was significant ($P < 0.05$).

Conclusion: The critical view of safety is the safest technique to recognize the anatomy of the calot's triangle and it significantly helped in preventing ductal injury.

Key words: Critical view of safety, classic infundibular, Laparoscopic cholecystectomy

Introduction

Laparoscopic cholecystectomy (LC) is considered a gold standard surgery for benign diseases of the gallbladder. It is one of the common surgical procedures taught to surgical residents.¹ It has advantages of improved quality of life with lesser pain, reduced hospital stay, faster recovery, and early return to work. But LC is also associated with increased incidence of major Bile duct injuries (BDI) compared to open cholecystectomy (OC) at 0.3% vs 0.1%.² There was an increase of 0.74 - 2.8%. BDI in the initial phases of LC due to the learning curve. Even in present times, it is still high at 0.3-0.4%. Major bile duct injuries are associated with increased morbidity and mortality.³ They need complex surgical interventions with more complications and a decreased quality of life. They are the major source of

medico-legal litigation. The degree of severity of the BDI ranges from simple obstruction to excision of large parts of the extrahepatic biliary tree. BDI may need a very complex biliary reconstruction or even liver resection or transplantation.⁴

Strasberg et al in the early nineties, pointed out how a “critical view of safety” (CVS) should be achieved every time, by dissecting the entire infundibulum off the liver bed and by freeing it of all fatty tissue, both in its dorsal and ventral aspects.⁵ This, in his opinion, would have prevented accidental biliary and vascular injuries, due to uncommon variations, incautious bleeding control, or unclear anatomy.⁶ These principles have been ignored until recent years, when standardization of the technique, together with some consistent data, have appeared in the literature, asserting that this way of dissecting the gallbladder pedicle would bear a highly protective role against bile duct injuries.⁷ The present study was conducted to assess critical view of safety during laparoscopic cholecystectomy.

Materials & Methods

The present consisted of 50 laparoscopic cholecystectomy patients of both genders. All gave their written consent to participate in the study.

Data such as name, age, gender etc. was recorded. Patients were divided into 2 groups. Each group comprised of 25 patients. In group I, critical view safety (CVS) cholecystectomy, and in group II, classic infundibular (IN) technique was followed. Parameters such as operative time, Nasser grade and complications etc. was recorded. Data thus obtained were subjected to statistical analysis. P value < 0.05 was considered significant.

Results

Table I Distribution of patients

Groups	Group I (25)	Group II (25)
Method	CVS cholecystectomy	IN technique
M:F	15:10	12:13

Table I shows that group I had 15 males and 10 females and group II had 12 males and 13 females.

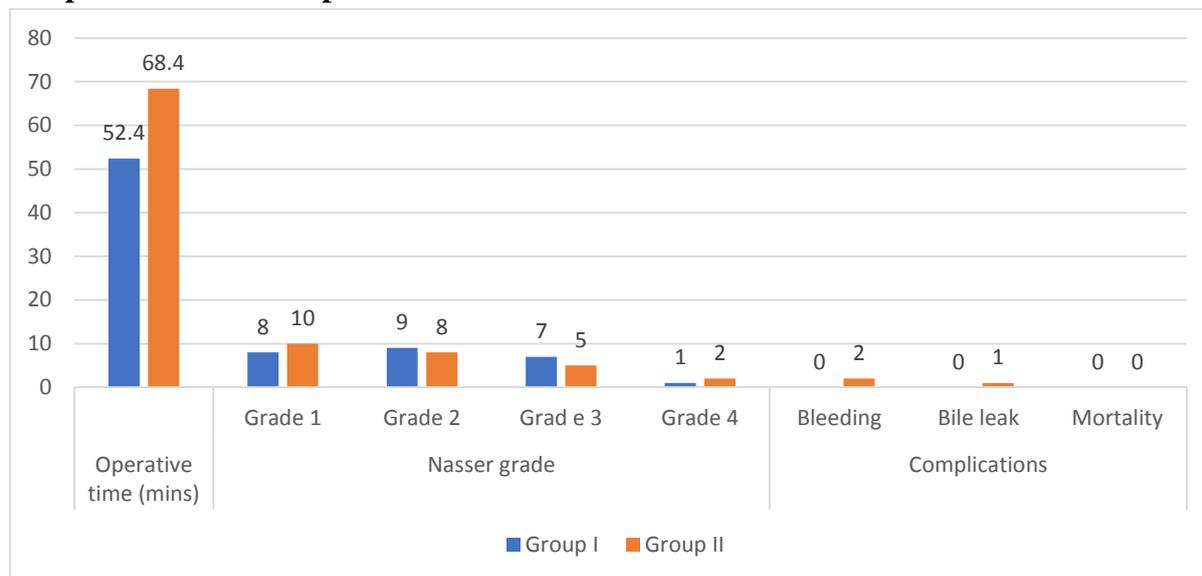
Table II Assessment of parameters

Parameters	Variables	Group I	Group II	P value
Operative time (mins)		52.4	68.4	0.02
Nasser grade	Grade 1	8	10	0.17
	Grade 2	9	8	
	Grade 3	7	5	
	Grade 4	1	2	
Complications	Bleeding	1	2	0.05
	Bile leak	0	1	
	Mortality	0	0	

Table II, graph I shows that mean operative time was 52.4 mins in group I and 68.4 mins in group II. Nasser grade 1 was seen in 8 and 10, grade 2 in 9 and 8, grade 3 in 7 and 5 and grade

4 in 1 and 2 respectively. Complications were bleeding seen in 1 in group I and 2 in group II, bile leak 1 in group II. The difference was significant ($P < 0.05$).

Graph I Assessment of parameters



Discussion

“Critical view of safety” (CVS) is to minimize the risk of bile duct injuries in LC.⁸ It follows three principles: (1) dissection of the Calot’s/ Hepatocystic triangle from all fatty and fibrous tissue, (2) mobilization of the lower 1/3rd part of the gallbladder from liver bed (cystic plate), and (3) the clear identification of two and exclusively two structures of the cystic duct and the cystic artery entering the gallbladder.⁹ Not until all three elements of CVS are attained may the cystic structures be clipped and divided. This concept was introduced in 1992 by Strasberg and named it CVS in 1995. During the past 25 years, this method has been increasingly adopted by surgeons all over the world for laparoscopic cholecystectomy.¹⁰ CVS is not a way to do cholecystectomy, but it is a way to avoid BDI by clear identification of the ductal system. The CVS is an adaptation of the method used for ductal identification that was practiced in open cholecystectomy.^{11,12} The present study was conducted to assess critical view of safety during laparoscopic cholecystectomy.

We found that group I had 15 males and 10 females and group II had 12 males and 13 females. Voruganti et al¹³ evaluated the efficacy of the critical view of safety in laparoscopic cholecystectomy done in 50 cases. The results were compared with the procedure by conventional Infundibular technique. Critical view of safety was achieved in 47 (94%) of cases without BDI. The majority of patients 19 cases (38%) were in the age group of 41-50 years. Intra operative assessment of difficulty was done by Nasser score. 13 cases were grade 1, 28 cases were in grade 2, 7 cases were grade 3, and 2 cases were grade 4. CVS was achieved in 47 cases and not in 3 cases. 2 were in grade 3 and 1 was in grade 4. These 3 cases belong to Nasser grades 3 & 4 with dense inflammatory adhesions. In these cases, CVS could not be achieved after a trial dissection of 30 minutes. They were considered a failure of the ductal identification and later bail-out procedures were taken up. Subtotal reconstituting cholecystectomy was done in all cases. Post-operative complications of bleeding, bile leak noted. Postoperative bleeding was present in 2 cases but controlled spontaneously in 3 days.

In a case with Nasser 4 class adhesions, active post operative bleeding but controlled with blood transfusion. No mortality and major bile leak or BDI were noticed.

We found that mean operative time was 52.4 mins in group I and 68.4 mins in group II. Nasser grade 1 was seen in 8 and 10, grade 2 in 9 and 8, grade 3 in 7 and 5 and grade 4 in 1 and 2 respectively. Complications were bleeding seen in 1 in group I and 2 in group II, bile leak 1 in group II. Alanis-Rivera B et al¹⁴ in their study a total of 744 questionnaires were evaluated; 284 (38.17%) women and 460 (61.83%) men; 436 (58.6%) were residents and 308 (41.4%) graduated surgeons. 708 (95.16%) reported knowing the CVS; however, only (51.98%, $p \leq 0.001$) defined the concept correctly, while 136 (18.28%) reported knowing the DS, but only 44 (5.91%) defined it correctly. Regarding the PGS, 398 (53.49%) mentioned knowing it, but only 262 defined it correctly. The concept of SC 642 (86.29%) reported knowing it; however, only (56.7%, $p \leq 0.001$) correctly defined the techniques, being the reconstituting technique the preferred one (42.37% vs 34.89%). In this survey, the correct knowledge of the CVS (OR 0.47, $p < 0.001$), the subtotal techniques (OR 0.71 $p = 0.07$), the DS (OR 0.48 $p < 0.001$) and of the PGS (OR 0.28, $p < 0.001$) decreased the risk of presenting BDI.

Vettoretto et al¹⁵ compared the critical view of safety triangle approach with the infundibular approach in a retrospective cohort study. They divided 174 patients into 2 groups, with a similar case-mix (cholelithiasis, chronic cholecystitis, and acute cholecystitis). Results of operations performed by a young surgeon using critical view of safety dissection were compared to results of the infundibular approach performed by an experienced surgeon. No difference occurred in terms of morbidity (even though comparison for biliary injuries is inconclusive because of insufficient power) and outcome; significant differences were found in operative time, favoring the critical view of safety approach in every stage of gallbladder disease, with minor significance for acute cases.

The limitation the study is small sample size.

Conclusion

Authors found that the critical view of safety is the safest technique to recognize the anatomy of the calot's triangle and it significantly helped in preventing ductal injury.

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