



A CLINICAL STUDY OF POSTOPERATIVE BILIARY LEAK IN DIFFICULT LAPROSCOPIC CHOLECYSTECTOMY

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KEYWORDS :

INTRODUCTION

Laparoscopic cholecystectomy has become the procedure of choice for management of symptomatic gall stone disease. Cholecystectomy whether laparoscopic or open is the most commonly performed hepatobiliary surgery. It has been observed that surgeons encountered difficulty while laparoscopic cholecystectomy, when there were dense adhesions at Calot's triangle, fibrotic and contracted gallbladder, acutely inflamed or gangrenous gall bladder and cholecystoenteric fistula etc.

There are many risk factors which make laparoscopic surgery difficult like

- old age,
- male sex,
- attacks of acute cholecystitis with fever and leucocytosis,
- obesity,
- previous abdominal surgery,
- ultrasonographic findings i.e., thickened gall bladder wall, distended gall bladder, pericholecystic fluid collection, impacted stone.

Biliary leakage is the most serious and dreaded complication after cholecystectomy. The early and accurate diagnosis of bile duct injury is very important for surgeons, because unrecognized bile duct injury leads to serious complications. The first iatrogenic bile duct injury was described by Sprengel in 1891.

OBJECTIVE

Biliary leak after difficult laparoscopic cholecystectomy incidence and management of biliary leakage.

METHODS

A case series of patient who had bile leak following difficult laparoscopic cholecystectomy in Government general hospital, Kurnool. 100 difficult laparoscopic cholecystectomy cases were included. In all the cases, drain placed.

The cases in whom biliary leak noted were followed prospectively and analysed in Government general hospital, Kurnool and were properly examined, investigated, treated and followed up for one month.

STUDY DESIGN - Prospective study

STUDY PERIOD - July 2021 to June 2022

Inclusion criteria

All difficult Laparoscopic cholecystectomy cases, based on the preoperative and intraoperative criteria.

Exclusion criteria

Patient underwent open cholecystectomy, conversion from laparoscopic to open cholecystectomy, biliary-enteric anastomosis, post endoscopic procedures and developed biliary leakage were excluded from this study.

Difficult Laproscopic Cholecystectomy

Both preoperative and intra operative factors are taken into consideration to define the difficult laparoscopic cholecystectomy. Preoperative score was given to every patient on the basis of history, clinical examination and sonological findings (Table 1). All intra operative events like duration of surgery, bile/stone spillage, injury to duct/artery were recorded and surgery was labelled as easy/difficult/very difficult based on these findings (Table 2).

Preoperative scoring parameters used for grading the patient (Table 1)

Parameter		Score	Max score
History			
Age (years)	≤50	0	1
	>50	1	
Gender	Male	1	1
	Female	0	
History of hospitalization for acute cholecystitis	Yes	4	4
	No	0	
Clinical parameters			
Body mass index (kg/m ²)	<25	0	2
	25–27.5	1	
	>27.5	2	
Abdominal scar	No	0	2
	Infraumbilical	1	
	Supraumbilical	2	
Palpable gallbladder	Yes	1	1
	No	0	
Sonographic findings			
Wall thickness	Thin <4 mm	0	2
	Thick ≥4 mm	2	
Pericholecystic collection	No	0	1
	Yes	1	
Impacted stone	No	0	1
	Yes	1	

EASY (0-5); DIFFICULT (6-10); VERY DIFFICULT (11-15)

Intraoperative assessment (Table 2)

Parameters	Level
Operative time <60min	Easy
Operative time 60–120min	Difficult
Operative time >120 min	Very difficult

RESULTS

A total of 100 difficult laparoscopic cholecystectomies were carried out in this study period in my institution, drain placed in every case. Out of 100 cases, 10 Patients developed bile leakage. Among the 10 patients, 7 patients were spontaneously recovered, 3 patients needed endoscopic intervention, such as endoscopic stenting and

sphincterotomy. 1 patient underwent exploration surgery and Hepatico-jejunostomy is done.

In this study, 10 bile leak cases were registered, out of which 4 were diagnosed as major bile duct injury and another 6 cases of bile leak were diagnosed as originated either from GB bed, duct of Luschka or minor bile duct injury.

In this study during one year period in our college, the incidence of major bile duct injury after difficult laparoscopic cholecystectomy is 0.4%. Incidence of bile leakage after difficult laparoscopic cholecystectomy is 1%. Placing a drain in cases of difficult laparoscopic cholecystectomy is useful to tackle the post operative risk of biliary leak.

POST OPERATIVE FOLLOW UP IN DIFFICULT LAPAROSCOPIC CHOLECYSTECTOMY



MANAGEMENT



DISCUSSION

The most frequent abdominal procedure worldwide is the cholecystectomy. A potentially fatal side effect of the cholecystectomy is biliary leakage caused by bile duct damage after the surgery. The negative consequences of bile duct injury can range from minor, clinically insignificant bile leaks, bilomas, and biliary ascites to biliary peritonitis, frank sepsis, and even death in the acute setting, as well as bile duct strictures, secondary biliary cirrhosis, portal hypertension, and end-stage liver disease requiring liver transplantation in the long term. In most cases, prompt and appropriate therapy can turn things around and protect the patient from severe morbidity and fatality. Numerous studies have demonstrated a decrease in bile duct injuries over time.

Bile duct injuries caused by inexperienced surgeons yet keep happening. In all but difficult situations, laparoscopic cholecystectomy has taken the place of open surgery. The technique is associated with decreased discomfort, a shorter hospital stays and surgical recovery period, and better cosmetic results. However, compared to open cholecystectomy, the laparoscopic technique has higher incidence of biliary damage, which varies from 0.5% to 2.0%. According to the study of Adamsen et al, 1997 and Kum et al, 1996; bile duct injuries are more common following laparoscopic cholecystectomy, including fistulae, which are reported in 1.3% to 5.5% of cases. Ali et al, 2007; Karvonen et al, 2007 also found that bile duct injuries are seen more frequently in the laparoscopic approach (0.2% to 0.7%) than in open cholecystectomy (0.1% to 0.4%).

In this study we found that incidence of bile leakage in difficult laparoscopic cholecystectomy in 10% patients which is higher when compared with overall lap cholecystectomy i.e., <1%. The GB bed, the Duct of Luschka, and other minor accessory bile ducts are discovered to be the most frequent sites of bile leakage in this study. This study, which is comparable to the study by Strasberg et al, 1995, found that type A bile duct injury was the most frequent kind of bile duct injury. In cases of post-operative biliary leak at our facility, ultrasonography and CT scan of the abdomen and pelvis are the most often performed investigations.

The anatomy of the bile duct and the location of the damage were further defined using MRCP. Conservative treatment is advised since spontaneous closure of the fistula is noticed, when biliary-enteric continuity is present and there is no impediment to bile flow distal to the origin of the fistula. Careful management of bile leaks has produced excellent results in the form of external bile drainage. However, surgical intervention should be considered in cases of severe bile duct injury.

This study took into account conservative therapy in the form of a controlled external biliary fistula. In our study about 70% of the biliary leak cases resolved spontaneously within few days with controlled external biliary fistula. Which is very identical to Chen XP et al study on the non-surgical therapy of bile leakage, who found 82.5% patient

recovered after nonsurgical treatment. Only one patient in this study required an exploratory laparotomy with hepaticojejunostomy.

CONCLUSION

Bile leakage is an unusual complication in cholecystectomy, but more frequently encountered in difficult laparoscopic cholecystectomy. Bile leakage can take place from both minor biliary radicle injury and major duct injury. Minor bile duct injuries can be treated conservatively, whereas major duct injuries needed endoscopic and surgical interventions.

Drain placement intraoperatively, which acts as the external controlled fistula is useful to manage the bile leak in post operative period. Endoscopic management has been an alternative to surgical intervention in all simple cases presented with postoperative bile leakage as an equal definitive management. In spite of the efforts through endoscopic management, if bile leak is not managed, then surgical intervention is the management of choice.

REFERENCES

1. Veerank N., Togale M. D. Validation of a scoring system to predict difficult laparoscopic cholecystectomy: a one-year cross-sectional study. *Journal of the West African College of Surgeons*. 2018;8(1):23–39
2. Massoumi, H., Kiyici, N., & Hertan, H. (2007). Bile leak after laparoscopic cholecystectomy. *Journal of clinical gastroenterology*, 41(3), 301–305. <https://doi.org/10.1097/MCG.0b013e31802c29f2>.
3. Moghul, F., & Kashyap, S. (2022). Bile Duct Injury. In *StatPearls*. StatPearls Publishing.
4. Adamsen S et al (1997) Bile duct injury during laparoscopic cholecystectomy: a prospective nationwide series. *J Am Coll Surg* 184(6):571–578
5. Karvonen, J., Gullichsen, R., Laine, S. et al. Bile duct injuries during laparoscopic cholecystectomy: primary and long-term results from a single institution. *Surg Endosc* 21, 1069–1073 (2007). <https://doi.org/10.1007/s00464-007-9316-7>
6. Strasberg, S. M., Hertl, M., & Soper, N. J. (1995). An analysis of the problem of biliary injury during laparoscopic cholecystectomy. *Journal of the American College of Surgeons*, 180(1), 101–125.
7. Chen, X. P., Peng, S. Y., Peng, C. H., Liu, Y. B., Shi, L. B., Jiang, X. C., Shen, H. W., Xu, Y. L., Fang, S. B., Rui, J., Xia, X. H., & Zhao, G. H. (2002). A ten-year study on non-surgical treatment of postoperative bile leakage. *World journal of gastroenterology*, 8(5), 937–942. <https://doi.org/10.3748/wjg.v8.i5.937>