

A Comparative Study of Early Versus Interval Cholecystectomy in a Case of Acute Cholecystitis



Medical Science

KEYWORDS : Acute cholecystitis , Early & Interval cholecystectomy.

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ABSTRACT

Introduction: In present days, there is controversy regarding superiority of early versus interval laparoscopic cholecystectomy Objectives : To study and compare early laparoscopic cholecystectomy versus delayed laparoscopic cholecystectomy with regards to benefits and harms. Outcome measures : • Conversion to open cholecystectomy, • Operating time, • Bile duct injury, • Unfavorable intra-operative inadvertent events & • Total Hospital stay. Conclusion : Even though, there is no significant different in these two intervention, Early cholecystectomy is safer & has definite socio-economical advantage in reducing total hospital stays.

Introduction:

The liver produces bile which has many functions including elimination of waste processed by the liver and digestion of fat. The bile is temporarily stored in the gallbladder before it reaches the small bowel. Inflammation of gallbladder (cholecystitis) can occur suddenly with symptoms such as fever along with intense pain in right upper abdomen. This is called Acute Cholecystitis. Ongoing inflammation with recurrent episodes of biliary colic or pain from cystic duct obstruction is referred to as Chronic Cholecystitis. The attacks usually last for more than 1 hour but subsides by 24 hours. If pain persists longer than 1 day, Acute on Chronic cholecystitis is likely the underlying etiology.

Removal of the gallbladder (cholecystectomy) is currently considered the best treatment option for people with acute or chronic cholecystitis. This is generally performed by elective (after 6 wk of index admission) laparoscopic cholecystectomy because of the fear of higher complication rates.

Why do we do Interval (after 6 wk of index admission) Cholecystectomy?

In early cholecystectomy, there is more chances of injury to the bile duct, which is life threatening condition.

Another reason for the surgeons' preference for delaying the operation is to avoid an open operation, as there has been a perception that early operation increases the risk of conversion from laparoscopic to open surgery.

Is there any scope for early (within seven days of clinical presentation or within 3 days of admission) cholecystectomy in acute cholecystitis?

Delaying the surgery exposes the people to the risk of complications related to gallstones (cholagitis, biliary colic, acute cholecystitis, gall stone pancreatitis, non-resolution of symptoms or recurrence of symptoms before their planned operation etc.).

With the growing experience and improvement in laparoscopic skills, recent studies have demonstrated that early laparoscopic cholecystectomy is safe for acute cholecystitis. (1,2,3,4)

Materials & Methods:

Hospital Setting :

The study was conducted at the surgical unit of civil hospital, Ahmedabad, a publicly funded tertiary care institution.

Type of study : Cross- sectional descriptive comparison study

Duration of study : May 2012 to October 2013

Data collection

A total of 50 patients , with a diagnosis of Acute cholecystitis who underwent cholecystectomy from May 2012 to October 2013 .out of them 25 underwent Early Cholecystectomy , and 25 underwent Interval cholecystectomy. Data collected included clinical features, laboratory investigations, imaging , type of surgery ,duration of surgery, intraoperative or postoperative complications ,duration of hospital stay.

Inclusion Criteria:

- All male & female with or without co-morbidities like diabetic or hypertensive are included in study.
- Diagnosis of Acute cholecystitis was confirmed by history , physical examination & Ultrasonography.

Exclusion criteria :

- The patients having history or investigation suggestive of severe pancreatitis
- pediatric patients
- pregnant female.

Data analysis

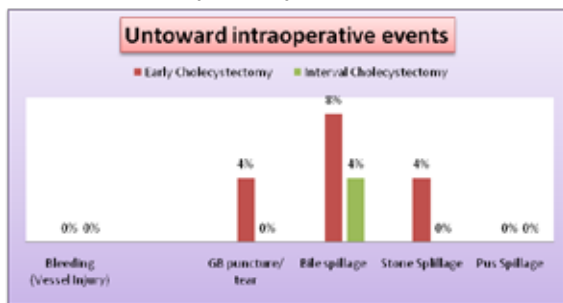
- Data were entered into a computer database using Microsoft Excel spreadsheet and statistical analysis was performed with Epi Info 2002 software (CDC and WHO, 2002). Results are presented as frequencies, percentages and descriptive statistics.

OBSERVATIONS & DISCUSSION

In the present study, there was bile spillage in 8% cases in early cholecystectomy whereas 4% in interval, this difference was not statically significant ($X^2=1.22$ $p>0.05$).

In study by Lo et al. (8) , there is no CBD/ vessel injury in early group (n=45), while 2.5 % of pts had Bile duct injury & 2.5 % of pts had bleeding in Interval group (n=41). Finding of the present study is not comparable with study of Lo et al. This may be due to small study size.

Table 1 : To Study Untoward intraoperative events in Early And Interval Cholecystectomy



These untoward events were due to unclear anatomy of calot's triangle in both early & Interval group.^(8,9,10,11) GB tear was done during handling of GB during retraction in early group. Bile & stone spillage was done during retrieval of GB. This untoward events were present in only Diabetic patient. In the present study, Bleeding was managed with Cautery & pressure application, while bile & stone spillage was managed with suction-irrigation & retrieval of each stone. Bile & stone spillage are associated with wound infection. This untoward event may be bring down with increasing experience and skills during early laparoscopic cholecystectomy for acute cholecystitis.^(8,18,19)

Table 2: To Study Difference Of Bile Duct Injury Between Early And Interval Cholecystectomy

Bile Duct Injury	Early cholecystectomy	Interval cholecystectomy
Johansson et al.	0/74	1/71
Kolla et al.	1/20 (5%)	0/20
Present study	0	0

In the present study, there was no Bile duct injury. So, comparison is not possible with study of Johansson et al. & Kolla et al. Larger studies are required to demonstrate small differences in bile duct injury between an early or delayed approach to acute cholecystitis.

Bile duct injury is the most feared complication during cholecystectomy and can be fatal. (5) The most common cause of major bile duct injury is misidentification of the common bile duct as the cystic duct. (6) However, operative cholangiography seems to be indicated when common duct stones or bile duct injury are suspected. (7).

Table 3 : To Study Difference Of Conversion To Open Surgery Between Early And Interval Cholecystectomy

Conversion To Open	Early cholecystectomy	Interval cholecystectomy
Present study (Prevalence)	2 (8%)	2 (8%)
H. Lau et al. (Prevalence)	84%	77.6%

In the present study, there was a same prevalence(8%) conversion To Open Surgery Between Early and Interval Group, which means there is no significant difference of conversion To Open Surgery Between Early and Interval cholecystectomy. This is comparable with study of H.Lau et al., Chandler et al., Rattner et al. & Serralta et al.^(8,9,10,11).

In Early group, there were two conversion into open cholecystectomy. one patient had mirizzi syndrome (type -I), having a cholecysto-choledochal fistula & Other patient had CBD stone. There were two conversion in Interval group due to difficulty in dissection of calot's triangle & CBD stone. In the present study, 3 out of 4 conversion was due to CBD stone & laparoscopic CBD exploration was beyond our purview, so laparoscopy was converted into open. This will be minimised with increasing experience.

During the early stages of acute inflammation, edematous connective tissue facilitates the dissection of the gallbladder and Calots triangle, but inflammatory hyperemia leads to increased bleeding.⁽⁹⁾ Although interval operation allows maturation of the acute inflammation, resultant fibrosis, neovascularization, and contraction make the dissection technically difficult and the operation potentially hazardous.^(8,10,11)

Factors associated with a significantly increased conversion rate include delay in surgery more than 3 days from the onset of disease, obesity, multiple comorbidities, empyema of the gallbladder, an inexperienced surgeon, and male gender.^(10,12)

Table 4 : To Study Difference Of Operating Time(min) Between Early And Interval Cholecystectomy

Operating time (min)	Early Cholecystectomy (mean) (min)	Interval cholecystectomy (mean) (min)
Yadav et al.	107.8	76.67
Kolla et al.	104	93
Lo et al.	135	105
Present Study	82.8	76

Though mean operation time was low in Interval cholecystectomy, but the difference between early and Interval cholecystectomy in terms of operating time was not significant at 95% confidence limit and degree of freedom =24 .(paired t test 2.06=2.18). This finding are comparable with study of Yadav et al.⁽⁴⁷⁾, Kolla et al. & Lo et al.^(8,13)

There are many factor affecting operating time like, experience of surgeon, unclear anatomy of calot's triangle, delay in surgery more than 3 days from onset of disease, obesity, multiple comorbidities, empyema of GB etc.^(10,14,15)

In the present study, operating time in early group was more due to difficult dissection of calot's triangle & associated comorbidities.

Table 5 : To Study Difference Of Total Hospital Stay(days) Between Early And Interval Cholecystectomy

Total hospital stay Mean (days)	Early Cholecystectomy	Interval cholecystectomy
Kolla et al.	4.1 (2-20)	10.1 (5-23)
Lo et al.	6	11
Lai et al.	7.6	11.6
Present Study	6	12

In the present study, total hospital stay was more in Interval cholecystectomy comparing with early cholecystectomy group. This difference was found to be statistically significant at 95% confidence limit and degree of freedom =24 .(paired t test =8.69>2.08. This finding is comparable with study of Kolla et al, Lo et al. & Lai et al.^(8,13,16)

In Interval group pts requiring two treatment episodes, one for the conservative treatment of acute cholecystitis and another for the definitive surgical treatment. In Early group, main advantage is less hospital stay due to definitive treatment in single admission. This reduces pharmacological expenses & hospital cost, which confer positive socio-economic impact to patients from lower socio-economic class⁽¹¹⁾ & This is more beneficial to a developing country like India.

Table 6 : Proportion of patients who required emergency LC in waiting period of Interval cholecystectomy

Proportion of patients who required emergency LC

Davilla et al. ⁽⁵³⁾	5/36 (13.9%)
Lai et al.	8/51 (15.7%)
Senapati et al.	20 %
Present study	4 /25 (16%)

In the present study, 16 % of pts underwent emergency LC. This is comparable with the findings of Senapati et al. & Lai et al.^(16,17) About one-fifth (20%) of the patients in the delayed group failed to improve with conservative treatment and required emergency cholecystectomy.

In the present study, emergency LC was due to acute attack of cholecystitis before their schedule Interval LC. This was major disadvantage of interval group.

Summary

In present study, in early group, one had mirizzi syndrome & other had CBD stone, laparoscopy was converted into open cholecystectomy. In two pts of interval group, who had CBD stone, laparoscopy was converted open cholecystectomy. This conversion is not statistically significant.

In early group, operating time was slightly higher than interval group. In early cholecystectomy there is inflammation obscuring the view of calot's triangle, which may be responsible for increased operating time. But with increasing experience this can be brought down. Thus, difference between early and Interval cholecystectomy in terms of operating time is not significant.

Total hospital stay was more in Interval cholecystectomy group because of second admission for definitive treatment. Early group had less total hospital stay, which significantly reduces socioeconomic burden of society.

During waiting period in Interval cholecystectomy group, 4 patients had attack of Acute cholecystitis, for which Emergency laparoscopic cholecystectomy was done. It indicates that Interval cholecystectomy does not give any guaranty for complete resolution of acute attack.

Thus, There is no significant difference between early and Interval cholecystectomy in terms of operating time & conversion to open. However there is definitive advantage of Early cholecystectomy over Interval cholecystectomy in reducing total hospital stay & providing definitive treatment in initial admission.

CONCLUSION

Early laparoscopic cholecystectomy is superior to Interval laparoscopic cholecystectomy in terms of a reduction in total hospital stay. Early operation may be safer and has definite socioeconomic benefits. There was no significant increase in complications or conversion rate, although operating time was increased. We believe that increasing experience should bring down the complication rate in the early group. Interval cholecystectomy increases the risks of further gallstone related complication & there is likely to be no advantage to initial conservative management and Interval laparoscopic surgery for acute cholecystitis in patients suitable for surgery.

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