Original Research Article

Management of Inflamed Gall bladders Irrespective of Time line- A Prospective Study

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Received: 29-11-2021 / Revised: 27-12-2021 / Accepted: 08-01-2022

Abstract

Introduction: Usually laparoscopic cholecystectomy is performed in symptomatic cholelithiasis as an elective procedure and is considered as a gold standard. The role of laparoscopic cholecystectomy in early stage of acute cholecystitis i.e.within 72 hours of onset of symptomsin terms of feasibility,efficacy and safety is well proved beyond doubt with secondary advantages of early recovery,shorter hospital stay,no associated complications of acute cholecystitis in waiting period,early return to work, overall beneficial for the patient and is noncontroversial now. As for as late laparoscopic cholecystectomyi.e.after 72 hours to 6 weeks is concerned, there is a lack of consensus among surgeonsbut there are certain studies in literature which clearly shows that late laparoscopic cholecystectomy is safe and feasible with all advantages of ELC if it is performed by experienced surgeons. Eventhough it is said that the severity of inflammation increases with the time but it is not always true as response to inflammatory process varies in each individual because of unique quintessence of inheritance and hence time is no more a barrier in performing late laparoscopic cholecystectomy provided surgeon is experienced and skilled in modified techniques used in the management of difficult gallbladders with frozen calot. **Methods**: In our study of 104 patients the intraoperative findings are almost similar in both groups irrespective of stage of acute cholecystitis and timeline.There were difficult GB with frozen calot in both group,these all were managed by intraluminal guided retrograde dissection technique with the principle that no anatomical structure passes through the lumen of GB. **Results**: There is no difference in surgical outcome in early vs late laparoscopic cholecystectomy in terms of safety and efficacy, even though in late phase it is technically difficult and more time consuming, needing special skill and experience and use of special modified techniques.Both groups were comparable in terms of morbidity, mortality and hospital stayindependent of time line. **Conclusion**: Laparoscopic cholecystectomy for acute cholecystitis during emergency admission is safe and associated with low morbidity and low conversion rate regardless of time limit.

Keywords: Acute cholecystitis, early laparoscopic cholecystectomy, late laparoscopic cholecystectomy, modified techniques, intraluminal guided retrograde dissection technique, transection technique with antegrade and retrograde dissection.

Introduction

Acute cholecystitis refers to inflammation of the gallbladder. The pathophysiologic mechanism of acute cholecystitis is blockage of the cystic duct by the stone or malfunction of the mechanics of gallbladder emptying which inturn leads to stasis, infection, edema, cholecystitis and if not treated leads to ischemia, gangrene, perforation,sepsis and death[1]. About 95% of people with acute cholecystitis have gallstones[2]. However that does not mean incidental findings of gall stone should be treated, as it is estimated that only 20% of patients with asymptomatic stones will develop symptoms within 20 years[3], and approximately 1% of patients with asymptomatic stones develop complications of their stones before the onset of symptoms, prophylactic cholecystectomy is not recommended in asymptomatic patients. Laparoscopic cholecystectomy is considered as a gold standard in the management of symptomatic cholelithiasis[4], because it results in less postoperative pain,better cosmesis,shorter hospital stay, less morbidity,early recovery and return to work. During initial evolutionary phase of laparoscopy only simple gallbladder surgeries were used to be done laparoscopically but now a days with increase exposure and experience more difficult gallbladders can be done laparoscopically irrespective of stage and time of surgery[5].

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Laparoscopic cholecystectomy has revolutionized the whole surgical world in the management of cholelithiasis as it is the most commonly performed laparoscopic surgery in the world and because of introduction of new innovative techniques and increased experience of the procedure more difficult and complex gallbladders can be now managed laparoscopically which were used to be managed by open surgery, therefore it doesnot need any special mention[6]. The application of laparoscopic cholecystectomy for acute chloecystitis remains controversial from the view point of its higher rate of morbidity and conversion to open surgery because of technical difficulties[7], in spite of its acceptance as gold standard worldwide for symptomatic gallstones. The conversion rate has been reported to decrease with the experience. The local and overall complication rates were shown to correlate with the time delay between the onset of acute symptoms and operation[8,9].

In case of acute cholecystitis options include:-

1. Early laparoscopic cholecystectomy (ELC) Performed within 72 hrs of acute attack.
2. Late laparoscopic cholecystectomy(LLC)performed after72 hrs.but before 6 weeks.
3. Delayed laparoscopic cholecystectomy(DLC) initial conservative followed by LC after 6 weeks.The safety and feasibility of early laparoscopic cholecystectomyi.e. within 72 hrs. of index admission is now no more a controversy, but there are a group of patients who due to one or another reason are not operated during this period i.e. the patients who report late to OPDor emergency or not responding to the conservative management or there is recurrence during waiting period for DLC needs late laparoscopic cholecystectomy. The safety and

feasibility of laparoscopic surgery in this stage needs to be evaluated. Acute cholecystitis is a common complication of gallstones. It can leads to significant morbidity and mortality from potentially life threatening complications such as empyema gallbladder, gallbladder gangrene and gallbladder perforation, these usually presents as surgical emergency and laparoscopic or open surgical intervention is advocated. However, the timing of lap. Cholecystectomy and value of additional treatment have been a matter of controversy[10]. In presence of acute inflammation laproscopic cholecystectomy becomes more challenging and difficult because of edema, exudates, hypervascularity, congestion, adhesions with adjacent structures, distention of gallbladder, friability of tissues, unclear and distorted biliovascular anatomy, risk of dissemination of infection and technical difficulties are the risk factors[11] which predisposes suboptimal outcome and high conversion rate to open cholecystectomy.As a result the patient is deprived of potential benefits of laparoscopic cholecystectomy. Delayed laparoscopic cholecystectomy potentially increases chances of further gallstones related complications during waiting interval and thus additional hospital admission,recent evaluation has indicated early laparoscopic cholecystectomy to be safe option in acute cholecystitis,although conversion rate to open cholecystectomy may be higher[12]. But technical modifications and expertise of surgeons has made the outcome of late laparoscopic cholecystectomy almost equal to early laparoscopic cholecystectomy[13]. The appropriate timing for laparoscopic cholecystectomy remains controversial and most of the recent evaluations indicates that early laparoscopic surgery is safe and there is a consensus among the surgeons regarding this but as delay increases the technical difficulties Increases due to organized adhesions and other complications associated with acute cholecystitis but there are also studies which indicates that eventhough delay increases complications but also inflammatory process varies from person to person and delay will not effect outcome and is comparable to results of delayed laparoscopic cholecystectomy[14,15,16]. Some studies found that there is no significance difference between early and late laparoscopic cholecystectomy in their primary outcomes. However, trials with high risk of bias indicates that early laparoscopic cholecystectomy during acute cholecystitis seems to be safe and shorten hospital stay[17,18,19,20]. It is the skill, experience and technical modifications by the surgeon which may have the ultimate effect on the surgical outcome[21].

Materials and methods

This prospective randomized comparative study is conducted in the Deptt. Of surgery, Govt. Medical College, Jammu w.e.fJAN.2019 TO JAN 2021 and further follow up for three to six months. The patient for surgery is selectd from those admitted through Emergency and OPD as acute cholecystitis with the time duration of 24 hrs. to 6 weeks, and divided these into three groups.

GROUP A: Patients operated within 72 hours(ELC).

GROUP B: Patients operated between 72hrs. to 6 weeks(LLC).

GROUP C: Patients operated after 6 weeks(DLC).

In group B are included all those patients who reported late to the emergency, recurrence during waiting period, failure of conservative management and any pt. willing for surgery in late phase for any reason and any pt. with choledocholithiasis, pancreatitis, cholangitis and ca gallbladder are excluded. Details of Data Recorded includes: Demographic details, history of the patients, clinical findings and severity, CBC, liver function tests, renal functiontests, radiological findings, timing of cholecystectomy, duration of surgical procedure, conversion rate, complication rate, mortality rate, length of hospital stay, any other relevant investigation and follow up.

Surgical procedure

All the patients in this study will be divided in two groups, all the groups have to undergo similar surgical procedure. All patients will be subjected to preanaesthetic checkup. All patients will be given preoperative antibiotics. Patient with supine position with placement of four ports are as for standard laparoscopic cholecystectomy, they are sited at umbilicus, subxiphoid and two in rt. Subcostal area, pneumoperitoneum createdprelimnary diagnostic laparoscopy done and intraoperative findings noted and the dissection started as per local situation i.e.antegrade, retrograde, intraluminal guided retrograde or transection at middle of GB body with antegrade and retrograde dissection technique.

Observations and results

Majority of patients are in age group of40-60(64.42%)years. Total no. of patients studied were 104,out of which73 were females and 31 were males. Youngest patient was 17 years old and oldest was 65yrs.Male to female ratio was3.1:7.3 as depicted in figure. Total no. of patients in early group were 52,having 39 female and 13 males and total no. of patients in late group. Were 52having 34 females and 18 males. In early group.33(63.64%) patients had mild,17(32.69%) patients had moderate and2(3.84%) had severe cholecystitis. In late grp. 27(51.92%)had mild,19(36.53%) moderate and 6(11.53%)had severe attack of cholecystitis. All our patients were of ASA-1 and ASA-11 and were subjected to operation,there were no poor ASA in both groups but do recommend alternate option for those not tolerating GA i.e.conservative management in mild and percutaneous cholecystostomy in severe acute cholecystitis. In our study there was no death,no serious complications,our three patients had bile leak in early laparoscopiccholecystectomy group which stopped spontaneously after 4 days (that could be from accessary duct) two patients in late grp.Three pts.in ELC group and five pts. in late group had port site infection which was due to retrieval of infected GB specimen.Two patients in early group and one in late group had sinus bleed which was controlled intraoperatively.Three patients in ELC and one pt. in LLC had systemic infection.There was one duodenal injury while releasing the dense adhesion of GB with duodenum.No CBD injury,intraabdominal collection,but there are reportsof more bile duct injuries when operation is performed on inflamed gallbladders by inexperience surgeon.The overall hospital stay and early return to work,after surgery has no significant difference in both groups. but ELC has socioeconomic advantage and also avoidrecurrent cholecystitis and associated complications and repeatedadmissions.Three patients in ELC and two in LLC were to be converted to open because of frozen calot,xanthogranulomatous cholecystitis and Mirrizi's type iv syndrome and associated distorted anatomy.

Table 1: Showing age and sex distribution of the cases

Age in years	No. of females	No.of males	No. of patients%
15-20	5(%)	3(%)	8(%)
21-30	13(%)	2(%)	15(%)
31-40	17(%)	3(%)	25(%)
41-50	24(%)	7(%)	25(%)
51-60	11(%)	11(%)	17(%)
61-70	3(%)	5(%)	8(%)
Total	73(70.19%)	31(%)	104

Table 2: Comparison of clinical severity in early vs late laparoscopic cholecystectomy

Clinical type	Early LC	Late LC
Mild	33(63.46%)	27(51.92%)
Moderate	17(32.69%)	19(36.53%)
Severe	2(3.84%)	6(11.53%)

Table 3: Comparison of intraoperative findings in early and late LC

Pathology	Early LC	Late LC	Total
Inflammation	28(53.84%)	21(40.38%)	49(94.23%)
Phlegmons	6(11.53%)	5(9.61%)	11(21.15%)
Gangrene	3(5.76%)	3(5.76%)	6(11.53%)
Mucocele	7(13.46%)	9(17.30%)	16(30.76%)
Empyema	3(5.76%)	6(11.53%)	9(17.30%)
Frozen calot	2(3.84%)	5(9.61%)	7(13.46%)
Xanthogranulomatous cholecystitis	1(1.92%)	0(0%)	1(1.96%)
Mirrizi's syndrome	2(3.84%)	3(5.76%)	5(9.61%)
Total	52(100%)	52(100%)	104

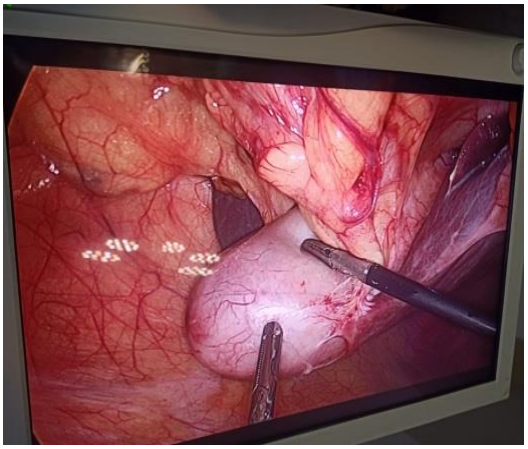
Table 4: Complication of early and late LC in terms of effect of time in surgical outcome

Surgical outcome	Early LC	Late LC
Operating time	52 min	60.5 min
Conversion rate	3	2
Hospital stay	1.44 days	1.3days
complications	4	3

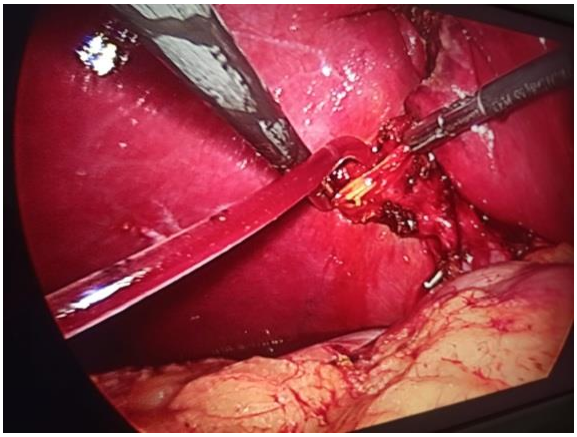
Table 5: Comparison of complications in early and late laparoscopic cholecystectomy

Complications	Early LC	Late LC	Total
Sinus bleed	2	1	3
Bile leak	3	2	5
Duodenal injury	1	0	1
Bile duct injury	0	0	0
Port site infection	3	5	8
Systemic infection	3	1	4
Mortality	0	0	0
Total	12	9	21

I.Empyema GB



. 2.Inflammed GB.



Stenting of cystic duct after Subtotal cholecystectomy for further dissection of GB stump.

Mucocele of Gallbladder

Discussion

Laparoscopic cholecystectomy has radically changed the field of general surgery,and with increasing experience,its application are expanding rapidly, laparoscopic cholecystectomy has become thestandard of care for symptomatic cholelithiasis. The pioneers of laparoscopic cholecystectomy,initially considered acute cholecystitis to be a contraindication for laproscopic surgery. The main reason for,conservative management was the concern of having ahigh risk of CBD injury due to edematous and inflamed tissues obscuring anatomy at calot's triangle. However, with the growing experience and greater technical skills,surgeons realized that these obstacles could be managed, consequently number of reports became available,advocating the feasibility of the laparoscopic approachin acute cholecystitis with an acceptable morbidity.Most of the randomized and prospective studies and their meta analysis comparing early and late laparoscopic cholecystectomies have shown no significant statical difference in mortality, morbidity,operation time and conversion rates and early laparoscopic cholecystectomy is considered as safe and feasible. Additional advantage of performing early laparoscopic cholecystectomy shows significantly shorter hospital stay and reduction of days away from work and offers definitivetreatment at initial admission and avoids repeated admissions for recurrent symptoms.However, current literature suggests that ELCshould be performed within72 hrs. boundary from the onset of symptoms and is having consensus in most of the studies. The effect of delay beyond 72 hrs. and its outcomes is not clear in literature and these groups have not been effectively tested in the existing randomized controlled trials.Even though early vs late laparoscopic cholecystectomy trials have been well tested in various trials and efficacy and safety have been proved to some extent. A number of initial clinical studies on the impact of delay beyond the 72 hours boundary increases the conversion rate and complications, however,the latest reports are emerging on safety of laparoscopic cholecystectomy in acute cholecystitis regardless of time line. The inflammatory response of acute cholecystitis is a well described pathological course. In early phase,the stages of hyperemia and edema predominate and these even facilitate the dissection at calot's triangle and after 72 hrs. chronic inflammation predominates with adhesions, fibrosis, hypervascularity and necrosis is responsible for the difficulty in dissection at calot, satriangle, but there is not much data available in literature which clearly analyse the difference between early and late stages of acute cholecystitis.In our study, in early laparoscopic cholecystectomy group the median timing from the onset of symptoms to operation is <72 hrs. with a range of 24-72 hrs.and in the late laparoscopic grp. Is >72-6-8 weeks.the clinical diagnosis is made according to the Tokyo guidelines[22]. Our analysis of data, majority are mild to moderate with with few severe, clinically in late laparoscopic cholecystectomy group.So the interpretation of our study is that the delay in the definitive treatment of acute cholecystitis is associated with increased clinical severity. Our intraoperative pathological findings of acute cholecystitis are as per the extent of inflammation broadly varies from simple acute cholecystitis with edema and minimal inflammation to phlegmatous type extensive inflammation with adhesions) and finally to gangrenous type(patchy to frank gangrene with or without perforation, in addition to inflammation. As per the current literature available, the pathological course of acute cholecystitis correlates with early edematous and late fibrotic phase of clinicopathological course of acute cholecystitis, however in our study, analysis of pathological findings, contrary to expectations, our findings showed that the pathological distribution of simple, phlegmatous and gangrenous have no significant difference in both groups(ELC vsLLC).Our findings that everybody has not the same inflammatory response but different individual have different response to inflammatory process. Numerous studies have shown that a no. of factors can effect the natural history of acute cholecystitis like co-morbid conditions like diabetes, hypertension, thyroid disorder, advance age, gender factor. shows that the inflammatory process is not only time dependent but other factors also contribute to the inflammation. Our findings showed that laparoscopic cholecystectomies done beyond 72 hours of onset of symptoms were not difficult as there was no significant difference in operating time in both the groups of laparoscopic cholecystectomy and there was also no difference in conversion rate to open cholecystectomy in both the groups. It is also pertinent here to emphasize that in case of severe inflammation in acute cholecystitis, lap. Cholecystectomy should be performed by the experienced and skilled laparoscopic surgeon and should not shy of to convert to open if any intraoperative complication occurs or inability to identify the anatomy at calot,s triangle. Some studies have shown better results in terms of conversion rate and morbidity because of improved skills and techniques with the time could be the reasons why the new reports are showing good results regardless of timing of operation in acute cholecystitis in comparison to earlier reports.

Conclusion

1. Clinical severity of acute cholecystitis increases with time but no pathological boundary exists as early or late as inflammatory response varies among different individuals.
2. Laparoscopic cholecystectomy for acute cholecystitis during emergency admission is safe and associated with low morbidity and low conversion rate regardless of time limit.
3. Patient admitted through emergency as a case of failure of conservative treatment,first timer,recurrence during waiting

period should undergo early or late laparoscopic cholecystectomy.

4. Late laparoscopic cholecystectomy is as safe as early laparoscopic cholecystectomy if performed by experienced laparoscopic surgeon.
5. Conversion to open procedure is not dependent on stage of acute cholecystitis but there is a subgroup of patients with frozen calot triangle which may be encountered during elective,early,late or delayed laparoscopic cholecystectomy.
6. Every individual in this universe is unique with different quintessence of inheritance with different response toinflammatory process.The safety and efficacy of early and late laparoscopic cholecystectomy for acute cholecystitis were comparable in terms of mortality, morbidity and conversion rates. However,early laparoscopic cholecystectomy allows significant shorter hospital stay and early return to work and offersdefinitive treatment at initial admission,moreover it avoids repeated admission in case of recurrence of acute cholecystitis.Conclusively,early and late laparoscopic cholecystectomy is advantageous medically as well as socio economically if performed by experienced surgeons, well versed with modified techniques (e.g.intraluminal guided retrograde dissection technique,transection at body with retro-antegrade dissection etc.).

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Conflict of Interest: Nil Source of support: Nil