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RESEARCH PAPER

Received: 14/09/2015 Revised: 25/10/2015 Accepted: 26/10/2015 Acute Cholecystitis- Emergency Surgery vs. Antibiotic Therapy and Delayed Elective Cholecystectomy: An Overview

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ABSTRACT

Early cholecystectomy for patients with acute cholecystitis is safe, cost effective, and leads to less time off work compared with delayed surgery. This study was designed to assess current practice in the management of acute cholecystitis. Recently general surgeons to ascertain their current management of patients with acute cholecystitis, were involved in treating patients with acute cholecystitis, routinely treated patients by early cholecystectomy, However some surgeons routinely manage their patients conservatively with intravenous antibiotics and allow the inflammation to resolve before undertaking cholecystectomy at a later date. Opinions among surgeons regarding the optimum management of acute cholecystitis remain divided. Some advocate early cholecystectomy during the initial admission, whereas others prefer to treat patients conservatively in the first instance with intravenous fluids and antibiotics and undertake delayed elective cholecystectomy. Early cholecystectomy for acute cholecystitis is safe and feasible, offering the additional benefit of a shorter hospital stay. It should be offered to patients with acute cholecystitis, provided the surgery is performed within 72 hours of the onset of symptoms. Two randomized controlled trials of early versus delayed laparoscopic cholecystectomy in the management of acute cholecystitis have both shown early laparoscopic cholecystectomy to be safe and associated with lower rates of conversion and reduced total hospital stay compared with delayed surgery. (Lai et al., 1998 and Lo et al., 1998) In addition, the hazards of conservative management of acute cholecystitis, especially with regard to patient readmissions, have recently been highlighted (Cheruvu and Brook, 2002 and Gurusamy et al., 2010) the aim of this review therefore was to assess current practice in the management of acute cholecystitis by general surgeons.

Keywords: Acute Cholecystitis, Emergency Surgery, Antibiotic, Cholecystectomy and Surgeons.

INTRODUCTION

Acute cholecystitis (AC) is a common diagnosis in the surgical practice with a clear indication for surgery. Although widely discussed in the past, unequivocal evidence exists supporting the superiority of early cholecystectomy within 72 hours over delayed cholecystectomy with respect to outcome and cost of treatment. (Lai et al., 1998, Lo et al., 1998, Cheruvu and Brook, 2002 and Gurusamy et al., 2010, Bhattacharya et al., 2002, Lau and Difronzo 2011, Lau et al., 2011 and Papi et al., 2004.) This trend was confirmed in a recently published randomized study in patients managed within 24 hours of admission (Wilson et al., 2010). Cholecystectomy however, may not always be possible within 24 hours of admission for many different reasons. In such cases, surgery should be performed within 72 hours as recommended in several guidelines (Miura et al., 2013). The aim of this study was to compare the outcomes of patients undergoing cholecystectomy within 24 hours of symptom begin on one hand to those of patients managed 25 to 72 hours after symptom begin for acute cholecystitis on the other hand. In our daily practice, we have realized that only a smallnumber of patients with AC are managed surgically within this "gold window" of 72 hours from the onset of symptoms. If the remaining majority of patients with AC are managed conservatively with interval cholecystectomy to follow, then an increased total hospitalization and subsequently increased cost can be expected.

MATERIAL AND METHODS

Patient selection and study design

Approval for this study was obtained from the hospital ethics committee. Between July 2011 and October 2015, 187 patients with adiagnosis of acute cholecystitis admitted to the Department of Surgery, Integral Institute of Medical Sciences and Research, Integral University, Lucknow, were included in the study. The diagnosis of acute cholecystitis was based ona combination of clinical criteria Table: 1 (acute right upper quadrant tenderness, temperature exceeding 99F, and white blood cell count greater than 11000/mm³) and Ultrasonographic criteria Table: 2 and Fig: 1 (thickened, oedematous distended gall bladder; positive sonographic Murphy's sign; presence ofgallstones; and Pericholecystic fluid collection). Patients withprevious upper abdominal surgery, coexistingcommon bile duct stones, or significant medical disease rendering themunfit for early cholecystectomy were not included in study. Informed consent was obtained. Patients were then randomized in to either the "early" group or the "delayed" group. Randomization was accomplished by a computer-generated numbers list kept by athird party. In the early group, cholecystectomy was performed within 24 h of randomization, whereas in the delayed group, conservative treatment with intravenous fluids and antibiotics including ceftriaxone, amikacin, and metronidazole was given. The patients who responded to conservative treatment underwent an elective cholecystectomy 6 to 12 weeks after the acute episode had subsided. The patients who failed conservative treatment were treated with emergency open cholecystectomy were excluded from the study. Patients with complicated acute cholecystitis (empyema, gangrenous, emphysematous, concomitant choledocholithiasis or pancreatitis) were also excluded from the study. Data were collected prospectively and included patient demographics, operative findings, operating time, length of post operative stay and total hospital stay (including the admission at presentation and admission for subsequent delayed surgery in the delayed group) and post operative complications.

Statistical analysis

Statistical analysis was performed using paired t-test and chi-square test. A p value less than 0.05 was considered significant.

Table 1. Clinical data and laboratory results for the patients in the early and delayedgroups at admission.

| Parameter | Early Cholecystectomy Group | Delayed Cholecystectomy Group |
|-----------------------|-----------------------------|-------------------------------|
| | (n=77) | (n=110) |
| Age (years) | 39.5+/-15.6 | 42.5+/-16.7 |
| Sex (M:F) | 2:9 | 1:5 |
| Duration of acute | 22.5+/-29.5 | 67.5+/-24.5 |
| symptoms (hours) | | |
| Maximum temperature | 99.8+/-0.7 | 99.1+/-0.5 |
| (⁰ F) | | |
| Total leukocyte count | 72.73% (n=56) | 43.64% (n=48) |
| (>11,000/ml) | | |

Table 2. Ultrasound findings for the patients.

| Ultrasound findings | Early Cholecystectomy Group | Delayed Cholecystectomy Group | |
|------------------------|-----------------------------|-------------------------------|--|
| | (n=77) | (n=110) | |
| Thickened oedematous | 74.03% (57) | 61.81% (68) | |
| gall bladder | | | |
| Distended gall bladder | 89.61% (69) | 67.27% (74) | |
| Presence of gallstones | 96.10% (74) | 94.54% (104) | |
| U/S Murphy's sign | 72.73% (56) | 78.18% (86) | |
| positive | | | |
| Pericholecystic fluid | 27.27% (21) | 26.63% (29) | |
| | | | |



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RESULTS

Within the period of study 187 cases of acute cholecystitis were managed surgically. Seventy seven patients were managed within 72 hours following symptom begins. The demographic characteristics of the study population are summarized in Table 1. Both groups were comparable in all cases. There was no significant difference in the duration of anaesthesia, the duration of surgery and the length of postoperative hospital stay amongst both groups as summarized in Table 3. This difference was not statistically significant, p = 0.23.

Operative procedures and operating time: More modifications in the operation technique and a longer operation time were required in the early group than in the delayed group. The mean operating time was 94 min (range, 49–139 min) in the early group and 83 min (range, 43–123 min) in delayed group. The difference in operation time was not statistically significant (p = 0.433). The average blood loss was 210 ml in the early group and 120 ml in the delayed group (p = 0.006). No patient in either group required blood transfusion.

Complications: There was no death in either group. The overall complication rate was 6.49% in early group and 4.54% in the delayed group. There was no major bile duct injury in the delayed group.¹⁸ However, in the early group one patient experienced postoperative cholangitis with subsequent cystic duct stump leak, which was treated by endoscopic retrograde cholangiography and stent placement.

Hospital stay: The mean total hospital stay was 6.7 days (range, 2–20 days) in the early group and 12.4 days (range, 5–23 days) in the delayed group. However, the mean postoperative hospital stay was 3.2 days (range, 1–20 days) in the early group and 2.3 days (range, 1–7 days) in the delayed group. The overall comparison of the patients in the early and delayed groups is shown in Table 3.

| Parameters | Early Cholecystectomy | Delayed Cholecystectomy |
|-----------------------------|-----------------------|-------------------------|
| Median duration of | 120.0 (45.0) min | 115.0 (35.0) min |
| anaesthesiology | | |
| (interquartile range) | | |
| Median duration of surgery | 94.0 (45.0) min | 83.0 (40.0) min |
| (interquartile range) | | |
| Median duration of | 7.0 (3.0) min | 6.0 (2.0) |
| postoperative stay | | |
| (interquartile range) | | |
| Total hospital stay | 6.7 ± 5.8 | 12.4 ± 6.8 |
| (days)(interquartile range) | | |
| Postoperative analgesia | 5.8 ± 1.6 | 4.1 ± 1.6 |
| (days) | | |
| Blood loss (ml) | 210 ± 140 | 120 ± 110 |
| Complications | 6.49% | 4.54% |

 Table 3. Summary of the perioperative and postoperative data.

DISCUSSION

Surgery for acute cholecystitis could be time critical. According to Zhu et. al. 2012, gall bladder inflammation during the first 72 h of onset of symptoms may not involve structures within the Calot's triangle (Zhu et. al. 2012).

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Surgical dissection within this critical period therefore appears easiest due to lack of organized adhesions. Cholecystectomy within this time frame reduces the risk of injury to the structures within the Calot's triangle. This is reflected in the low rates of complication and morbidity. There was no significant difference amongst both groups with respect to the duration of anaesthesia andthe duration of surgery. Equally, there was no significant difference in the rate of morbidity between both groups. We could not find any difference in outcome between the groups managed early cholecystectomy and delayed cholecystectomy.

The optimal timing of surgery for patients with acute cholecystitis has been a topic of controversy in the past. Initially, patients were managed conservatively with the aim of "cooling down" the inflammation, and then perform cholecystectomy weeks later.

Acute cholecystitis which is generally found in approximately 20% of all admissions for gall stone disease (Wilson et al., 2010) is no longer considered a contra indication for cholecystectomy. Now a day's urgent cholecystectomy is now considered theoptimal treatment of patients withacute cholecystitis (Uchiyama et al., 2004). Early cholecystectomy hasbeen proven superior to delayed interval cholecystectomy in most of the prospective randomized trials. It results in a shorterhospital stay and a shorter recovery time while the complication remain similar with delayed interval cholecystectomy (Lo et al, 1998, Cheruvu and Brook, 2002 and Gurusamy et al., 2010).

The term, early "is rather vaguely defined in the literature (Uchiyama et al., 2004). In some series, "early "defines begins of symptoms while the same term is used with regard to the time of admission in other series. In this study, "early" was defined with respect to symptom begin. Generally speaking, early cholecystectomy is performed within a time interval of 72 hours, the so called golden 72 hours (Ambe et al., 2014). In daily practice every few patients are able to have surgical treatment during this short period of time, due to either patient or/and physician delay (Eldar et al., 1999). Very often patients present withdelay or they are referred with delay by their physicians. Others suffer from co-morbidities needing consultation with other specialties preoperatively, while some requireother intervention preoperatively, i.e. ERCP. A significant number of patients take oral anti-coagulants or anti platelet agents requiring reversing before surgery. For allthese reasons many patients in reality cannot have surgery within this time frame.

This could be sometimes misleading, as the onset time of episode could differ significantly from the time of admission. We believe that counting from the onset of symptoms is more representative of the reality. Furthermore, all the studies were designed by using a boundary either of 48, 72 or 96 hours from either onset of symptoms or time of admission, in order to compare the two groups of population. The aim of this study was to compare the outcomes of patients with acute cholecystitis managed within 72 hours of symptom begin to those of patients managed after 72 hours following symptom onset.

In this study series about 59% ofpatients with acute cholecystitis were treated surgically during the index admission beyond the 72 hours boundary, which is not very different from the reported experience by other authors (Papi et al., 2004, Wilson et al., 2010 and Miura et al., 2013) There were no solid data regarding the optimal policy for this large group of patients treated outside this 72 hours boundary. To our knowledge, there is only one small prospective randomized trial designed to address this issue.

Chandler et al., 2000, found that there is no difference in the morbidity between the early group (surgery as soon as theatre schedule allowed) and the delayed group (surgery during the index admission, after resolution of symptoms or failure to resolve on five days course of conservative treatment). Results from other comparative non-randomized trials of early and delayed cholecystectomy during the urgent admission foracute cholecystitis are rather conflicting and most of these however indicate a higher conversion rate for the delayed group, but no difference in morbidity (Kolla et al., 2004, Lahtinen et al., 1978 and Eldar et al., 1999). Our findings are in accordance with previous studies, early, but also to those treated after the window of the first 3 days from the onset of symptoms. Our data have shown that the timing of cholecystectomy does not influence the morbidity rate, as recently shown by others (Papi et al., 2004, Wilson et al., 2010 and Miura et al., 2013). Another issue of concern in early cholecystectomy of acute cholecystitis the presumed increased risk of bile duct injury when theprocedure is performed beyond the early oedematous phase of the first 48-72 hours. Our data do not support this traditional belief, as there was no major bile duct injury in anyof the patients. It is possible that the majority of patients with acute cholecystitis who are deferred for interval cholecystectomy because they are outside this "early window of chance" are faced witha "difficult" elective cholecystectomy after few weeks (Ambe et al., 2014). Waiting for the gall bladder to "cool down" allows maturation of acute inflammation, neovascularization, fibrosis, and contraction, making the dissection more difficult, asit has been proposed by others (Wilson et al., 2010). While inflammation in the early stages may not necessarily involve Calot's triangle structures, chronic inflammation may scar and distort it, making dissection in this critical area more difficult and prone to bile duct injuries.

CONCLUSSION

In conclusion, our study show that cholecytectomy for acute cholecystitis duringthe index admission is safe and associated with a low morbidity, lower hospital stay and a low cost. Further prospective randomized trials focusing on this particular question arerequired to validate these results. However, it appears reasonable to state that in surgical units, every effort should be made to operate on all patients with AC during the index admission as soon as diagnosis is made and co-morbidities are dealt with, regard less of the time delay from the onset of symptoms. This policy is safe, not associated with a highermorbidity and results in an overall shorter hospitalization by avoiding re-admissions. The golden 72 hours' time-frame however should be maintained where possible (Ambe et al., 2014).

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