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Early Versus Delayed Laparoscopic Cholecystectomy In Patients With Mild Acute Biliary Pancreatitis.

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ABSTRACT

Background: Acute gallstone pancreatitis is the common condition marked by pancreatic inflammation. In general, patients with gallstone induced mild pancreatitis should undergo definitive treatment in the form of LC before discharge from hospital, during first admission itself. This is more important to prevent a further attack of acute pancreatitis, seen in as many as 30-50%, during the waiting period of LC. Our study analyzes various parameters in patients which were treated by early and delayed laparoscopic cholecystectomy who presented with mild acute biliary pancreatitis. **Methods:** A prospective study was conducted for one year, where 25 cases were operated early (within 8 days of pain abdomen) and another 25 cases were operated by delayed laparoscopic cholecystectomy for diagnosed mild acute biliary pancreatitis. Various parameters were assessed and compared which included both intra operative and postoperative events. Haemodynamically unstable, associated choledocholithiasis, severe AP and patients with malignancy were excluded from this study. **Results:** Twelve cases presented with recurrent attacks in waiting period which were delayed for surgery. In early group, operative time ranged from 19-40 minutes, operative blood loss about 10-50 ml, 3 patients were converted from LC to OC, 6 patients needed a drain and hospital stay ranged from 2-6 days. In delayed group, operative time ranged from 18-36 minutes, operative blood loss about 10-40 ml, 2 patients converted from LC to OC, 3 patients needed a drain and hospital stay ranged from 1-5 days. Post operative analgesia dose was also comparable. **Conclusion:** In new era of sophisticated technology, improved operative techniques and better post operative management; early LC is gold standard approach in patients with mild to moderate gall stone induced AP. It protects against further attacks of biliary pancreatitis, with no increase in complications or morbidity. Therefore, LC in the early period is safe, effective and feasible in patients of gallstone induced AP, preventing recurrent attacks, which otherwise cause significant morbidity and even mortality in patients.

Keywords: Acute Biliary Pancreatitis, Laparoscopy, Cholecystectomy.

INTRODUCTION

Acute Pancreatitis (AP) is an inflammatory disease of the pancreas that is associated with little or no fibrosis of the gland, and which may be followed by clinical and biological restitution, if the primary cause is eliminated. Clinically, the severity of AP varies significantly. Most patients experience a mild form of the disease, which is self limiting, while others suffer a more severe and sometimes a fatal attack. Mild form constitutes about 80% of cases with a mortality around 1%, while severe attack occurs in rest 20% of cases which is associated with mortality ranging from 20% to 50%. One major cause of AP is biliary calculi, which accounts for about 50-70% of cases presenting with this disease.[1] Acute gallstone pancreatitis is a common condition throughout the world, marked by pancreatic inflammation. AP is thought to be triggered by the passage of gallstone down the Common Bile Duct (CBD). Patients who have small gall stones and a wide cystic duct may be at a higher risk of passing stone. Gall stone migration with obstruction of the CBD and pancreatic duct triggers Acute Biliary Pancreatitis (ABP).[2]

In patients who survive one episode of AP, every effort must be made to prevent recurrent disease, in the form of cholecystectomy. Without definitive treatment, the recurrence rate of pancreatitis is as high as 60%.[3] Laparoscopic Cholecystectomy is the treatment of choice to prevent further attacks. Controversy regarding the timing of cholecystectomy in the patients with ABP still exists.[4] Patients with severe AP with associated dysfunction of multiple organs are, unequivocally,

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logical choice for the initial conservative approach with Delayed Laparoscopic Cholecystectomy (DLC), 4-6 weeks after the subsidence of acute phase. But, patients with mild biliary AP, who incidentally form the major group (80%),[5,6] do not have any associated dysfunction and thus are candidates who should be offered Early Laparoscopic Cholecystectomy (ELC) during first admission itself.[7] This is to prevent a further attack of AP, seen in as many as 30-50% of these patients during the waiting period of LC and also to reduce the number of defaulters.[8] Delayed cholecystectomy is associated with recurrent attacks of AP. Delaying LC has got no advantage regarding intra operative complications but it may increase overall morbidity leading to prolonged hospital stay.

MATERIALS AND METHODS

This prospective study was conducted at Indira Gandhi medical college Shimla, a tertiary care centre, over a period of one year. A total of fifty (50) patients were divided in two groups (I and II). Group l comprised of 25 patients of mild AP who were operated during the same admission i.e. within 8 days of the acute mild pancreatitis. Group ll comprised of other 25 patients of mild AP who had a delayed LC, i.e. after 4-6 weeks of illness. Patients were subjected to clinical examination and lab tests including serum amylase and serum lipase to diagnose a case of AP. Ultrasonography (USG) was done to have an evidence of gallstones induced AP and to rule out presence of CBD dilatation due to choledocholithiasis. If there was an evidence of dilated Common Bile Duct (CBD), patients were subjected to Magnetic Resonance Cholangiopancreatography (MRCP) to rule out choledocholithiasis. Severity of pancreatitis was assessed by Contrast Enhanced Computerised Tomography (CECT) scan of abdomen and patients were labelled to be suffering from either mild or severe AP. Mild cases included both mild and moderate (0-6 points) according to modified CT severity index by Mortele et al.[9] Conventional 4 port LC was done under general anaesthesia in all selected patients. The parameters compared were episodes of abdominal pain of pancreatic origin with in waiting period in DLC, time interval between onset of pain and operation, operative time, operative blood loss, difficulty in dissection, conversion to open cholecystectomy, need for drains, any intra operative and post operative complication, hospital stay after surgery, post operative analgesia dose requirement and follow up USG of abdomen at 2 weeks to find any collection or any other complication following LC. Informed consent was taken from all patients participating in the present study.

Inclusion And Exclusion Criteria

Patients who were included in the study were those who presented with symptoms and signs of acute pain abdomen of pancreatic origin, USG proved cases of Cholelithiasis, once diagnostic investigations were suggestive of AP and only cases of mild AP. However, haemodynamically unstable patients, who were unfit for LC, patients with severe AP, contrast allergy, those who presented late (more than 8 days), known case of pancreatic or gall bladder malignancy and patients with choledocholithiasis were excluded from the study.

RESULTS

Out of the total 50 patients, age of the patients in Group I ranged from 21 to 69 years and in Group II ranged from 21 to 75 years. Eighteen (38%) patients were male and 32 (62%) patients were female. Out of the total 25 patients in Group II, 12 (48%) cases presented with recurrent attacks in waiting period [Table 1], out of which 5(20%) patients had 2 attacks, 4 (16%) had 3 and 3(12%) had 1 attacks respectively.

Table 1: Number of recurrent attacks in different patients

Total no. of patients Group II (n=25)	No. of patients with recurrent attacks	No. of patients without recurrent attacks
25	12 (48%)	13 (52%)

Serum Amylase levels ranged from 304 IU to 2582 IU. Modified CT severity index among both the groups ranged from 0-6. Out of total 50 patients in both the groups with raised serum amylase levels, 5 (10%) patients did not show any changes of AP on CECT abdomen, rest had obvious changes. In Group I, all the patients were operated between 3-8 days of pain abdomen [Table 2] where as in Group II; patients were operated within 32 to 65 days of pain abdomen.

Table 2: Time between onset of pain and operation

Group I		Group II	
No. of days b/w pain and operation	No. of patients (n=25)	No. of days b/w pain and operation	No. of patients (n=25)
3	1 (4%)	31-35	3 (12%)
4	3 (12%)	36-40	6 (24%)
5	10 (40%)	41-45	9 (36%)
6	8 (32%)	46-50	2 (8%)
7	2 (8%)	51-55	3 (12%)
8	1 (4%)	56 or >56	2 (8%)
	25 (100%)		25 (100%)

Table 3: Operating time

Operating time (in minutes)	Group I (n=25)	Group II (n=25)
15-20	1 (4%)	3 (12%)
21-25	6 (24%)	3 (12%)
26-30	12 (48%	14 (56%)
31-35	3 (12%)	3 (12%)
36-40	3 (12%)	2 (8%)

Among Group I patients, operative time ranged from 19-40 minutes with a mean of 28.2±5.38 minutes.

Among Group II patients, operative time ranged from 18-36 minutes with a mean of 27.28±4.80 minutes. Maximum number of patients, 14(56%) were operated in the time range of 26-30 minutes among both the groups [Table 3].

In Group I, approximate intra-operative blood loss ranged from 10-50ml, however in Group II, it ranged from 10-40 ml [Table 4].

Table 4: Operative blood loss (approx.)

Approx. blood loss (ml)	Group I (n=25)	Group II (n=25)
10 or <10	2 (8%)	5 (20%)
11-20	15 (60%)	17 (68%)
21-30	7 (28%)	2 (8%)
31-40	0 (0%)	1 (4%)
>40	1 (4%)	0 (0%)

Calot's Triangle anatomy was clear in 20 (80%) patients in Group I and 21 (84%) patients in Group II. Five (10%) patients were converted from LC to OC among both the Groups. In Group I, 3(12%) and in Group II, 2(8%) patients were converted from LC to OC respectively. Out of total 50 patients, 9(18%) had a need for drain, 6(24%) in Group I and 3(12%) in Group II. In post- operative analgesia requirement 3-7 injections of Aceclofenac were required in Group I, whereas 2-7 injections of Aceclofenac were required in Group II. The dose of analgesia requirement was calculated according to Visual Analogue Scale (VAS) *. Hospital Stay in Group I patients ranged from 2-6 days with a mean of 3.04 days, whereas in Group II, it was from 1-5 days with a mean of 3.08 days [Table 5].

Table 5: Hospital stay (From time of operation to discharge)

Hospital stay (Number of days)	Group I (n=25)	Group II (n=25)
1	0 (0%)	1 (4%)
2	10 (40%)	7 (28%)
3	9 (36%)	11 (44%)
4	2 (8%)	4 (16%)
5	3 (12%)	2 (8%)
>5	1 (4%)	0 (0%)

One (4%) patient in Group I presented with a post operative collection of 20 millilitres when a follow up USG abdomen was done 2 weeks after surgery, whereas in Group II, no patient presented with post-operative collection.

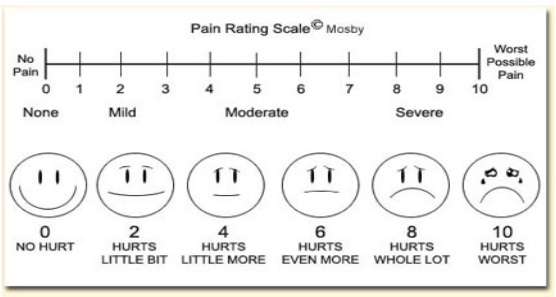

FIGURE 1: visual analogue score (VAS)*

Reips UD, Funke F. Interval level measurement with visual analogue scales in internet based research. 2008 VAS Generator doi:10.3758/BRM.40.3.699.

DISCUSSION

Gallstone disease is the most common cause of AP.[10] Most patients with biliary AP suffer a mild attack and are expected to make a full recovery. Cholecystectomy is indicated to prevent recurrent attacks of pancreatitis.[11] Management of gallstone AP has evolved substantially as LC has become more widespread in its use. Of note, the timing of cholecystectomy is now much earlier in the course of management, especially for the patients with mild pancreatitis.[11] The safety and efficacy of LC for acute cholecystitis is well accepted and has become the standard of practice for gallbladder removal.[12] Currently, LC is accepted as the standard approach for the patients with biliary AP, but timing of LC remains a subject of ongoing debate. Delayed Cholecystectomy is associated with attacks of recurrent biliary pancreatitis in 25-61% of patients. Delaying cholecystectomy has got no advantage regarding incidence of intra-operative complications rather it may increase the overall morbidity leading to prolonged hospital stay.[13-15]

The first report on early surgery in biliary AP was published by Acosta et al,[16] where early Cholecystectomy was done in 46 cases and mortality was found to be 2%. Eighty six patients with AP were treated conservatively and delayed cholecystectomy was done. The mortality was 16% in the Group with mean hospital stay being 25 days as compared to 13 days in early group.

The age of the patients in the present study ranged from 21-75 years which was comparable to 18-74 years in a study by Aboulian et al,[17] and 28-83 years by Tete JJ et al.[18] In another study by Rajeev Sinha,[19] the age of the patients was reported higher (35-84) years in comparison to the present study. The male to female ratio in the present study was 0.56 which was comparable to the ratio in the study by Rajeev Sinha,[19] in which the male to female ratio was 0.42 and in the study by Uhl W,[20] male to female ratio was 0.92. It is clear from these studies that AP seems to affect both genders equally with slight female preponderance.

The most significant finding was the recurrent attacks of AP after the initial attack. The number of patients with recurrent attacks in the present study was 12(48%). The recurrent attacks were diagnosed at the same centre. These patients were diagnosed as a case of AP on the basis of similar symptoms at the initial presentation, raised serum amylase levels and MCTSI. One (4%) patient presented with recurrence of attack after 7 days of initial attack. This patient was admitted for 4 days and readmitted after 3 days of discharge with similar complaints. These findings were similar to a study by Burch et al,[21] in which

out of 65 patients, 29(44%) suffered from recurrent pancreatitis. According to a study by Nebiker et al,[22] 22% of patients presented with recurrent attacks. In other studies, Lee JK[3] found recurrent attacks in 60% of patients, Osborne et al,[8] in 45% of patients, Cameroon DR,[13] in 25% of patients, Papi et al,[23] in >20% and Elfstorm J,[24] in 25% of patients. These recurrent attacks are the main cause of increased morbidity and mortality as stated by Alimoglu O et al.[14] Nearly in all patients, serum amylase levels were raised more than 3 times. In Group I, the lowest level was 304 IU and highest level was 2582 IU. In Group II, lowest level was 223 IU, and the highest level was 2340 IU (p=0.44) at the time of first attack with a mean of 808.02 IU, which was comparable to mean serum amylase levels of 1016 IU in a study by Tang E.[25]

MCTSI in the present study was done in all the patients with history and clinical findings suggestive of AP and raised serum amylase levels. In both the groups, 5(20%) patients had no changes on CECT and in 5(20%) patients, MCTSI was 6(p=0.88), which was comparable to a study by Balthazar et al,[26] in which CECT was normal in 20% of cases. All the patients in Group I were operated within 8 days of onset of pain abdomen and in Group II, within 32-61 days. Rajeev Sinha,[19] operated all the patients in early group within 7 days of pain abdomen. Uhl W et al,[20] operated patients with a median duration of 10 days (range 4-19 days) in early group. Results of all these studies show that ELC should be done preferably within 10 days of illness.

Mean operative time in Group I was 28.2±5.38 minutes whereas in Group II, it was 26.88±4.80 minutes (p=0.67) and the difference was statistically insignificant. Most of the patients (52%) in both the groups were operated in the time range of 26-30 minutes. Operative time varied from10-35 (mean=16.5) minutes in early and 8-37(mean=14.2) minutes in delayed group respectively in a study by Rajeev Sinha.[19] In a study by Prabhu RY et al,[27] operative time was 70 and 98 minutes in early and delayed groups respectively. These studies indicate that there is almost no difference in operative time in both the groups.

In Group I, mean intra operative blood loss was 22.20±7.64 ml whereas in Group II, it was 18.36±6.77 ml (p=0.19), which was stastically insignificant. In Group I, blood loss was partially owing to flimsy adhesions of omentum with gall bladder. Prabhu RY et al,[27] in their study, had intra operative blood loss in 22.2% and 30% of cases in early and delayed group respectively. They had included only those patients who had significant blood loss in their study.

Calot's Triangle anatomy was unclear due to adhesions in 5(20%) patients in Group I and 4(16%) patients in Group II (p=0.71), which was statistically insignificant. These adhesions were partly attributed to previous attacks of cholecystitis due to gallstones. In a study by Schachter P,[15] there were dense adhesions in 31.5% of patients in early group and 10% patients in delayed group. Alimoglu et al,[14] did not find any difference in Calot's Triangle anatomy and adhesions. Prabhu RY et al,[27] in their study, noted adhesions in 33.3% and 30% cases respectively, in early and delayed group.

Conversion rate from LC to OC was also comparable in both the groups as there were 3(12%) conversions in Group I and 2(8%) conversions in Group II(p=0.637), the difference being stastically insignificant. These conversions were due to dense adhesions in Calot's Triangle in all these patients. Schachter P,[15] converted 12% patients in early group and 8% in delayed group from LC to OC. However, they concluded by saying that delaying cholecystectomy was not advantageous in mild AP. Prabhu RY et al,[27] noted a conversion rate of 11.1% and 10% respectively in early and delayed group. Conversion rates were equal in a study by Nebiker et al.[22]

Drain in the form of Ryle's Tube no. 14 FG was kept after assessing the need to drain the operative site after surgery. Apprehension regarding secondary haemorrhage was the main reason to keep the drain after adhesionolysis in Calot's Triangle during surgery. In Group I, 6(24%) patients and in Group II, 3(12%) had a need to keep the drain (p=0.463) which was statistically insignificant. In a study by Prabhu RY et al,[27] 33.3% of cases in the early group and 30% cases in delayed group respectively required drain.

Hospital stay was calculated from the day of operation till discharge of the patient. In Group I, mean hospital stay was 3.04±1.17 days whereas in Group II, it was 2.96±0.98 days (p=0.61) which was statistically insignificant. Average total hospital stay after surgery was 4.7 days in early and 3.5 days in delayed group in a study by Tayler E.[7] In another study by Alimoglu et al,[14] mean hospital stay was 15.29 days in early group and 36.66 days in delayed group. Tang E et al,[25] in their study had mean hospital stay of 2.4 days in early group, as compared to 3.9 days in delayed group.

CONCLUSION

Laparoscopic cholecystectomy during the early period of acute mild biliary pancreatitis is safe, effective and feasible. It causes a significant reduction in the length of hospital stay with no significant increase in the complications or mortality.

Limitations

There are few limitations in this study.

(1) The sample size is small as there are only 25 patients in each group. In such situations, it is difficult to

demonstrate the exact difference in outcome between two groups.

(2) In early group patients were operated within 8 days of pain abdomen. In most of the studies, early surgery was done between 3-5 days. This limitation was due to the reason that patients sometime presented late, because in this area geographical conditions are not favourable, as it is a hilly terrain mostly covered with snow in winter season.

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