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ORIGINAL RESEARCH

Comparative study between early and delayed cholecystectomy in acute cholecystitis

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ABSTRACT

Background: This was a comparative study between early and delayed cholecystectomy in acute cholecystitis. **Material and methods:** The present study enrolled 100 patients presenting with features suggestive of acute cholecystitis in surgical OPD and emergency of either gender. Patients weredivided into two groups. If patient meets all criteria a) biliary colic b) pain radiating to back c)positive response to sample analgesics then the patient underwent early cholecystectomy. If criteria were not met then the patient was selected as candidate for delayed cholecystectomy. Group I patients underwent early cholecystectomy and group II patients underwent delayed cholecystectomy. All enrolled patients were made aware of the study and their written consentwas obtained. Ethical clearance was obtained from institutional ethical clearance committee. **Results:** While assessing the USG findings, single gallstone was seen in 66 percent of the patients ofthe early group and in 72 percent of the patients of the delayed group while multiplegallstones were seen in 34 percent of the patients of the early group and in 28 percent of the patients of the delayed group. wall thickness was more than 4 mm in 100 percent of the patients of patients of both early and delayed group. Pericholecystic fluid was seen in 22 percent of the patients of the early group and in 24 percent of the patients of the delayed group. Non-significant results were obtained while comparing the USG findings among earlyand delayed group respectively. On assessing the intraoperative findings, drain was used in 72 percent of the patients of theearly group and was significantly higher in comparison to delayed group where drain was used in 46 percent of the patients. In 12 percent of the patients of the early group and in 14percent of the patients of the delayed group, surgical procedure was converted to open technique. Both the groups were comparable in terms of conversion rate to open technique. **Conclusion:** The safety and efficacy of early and delayed laparoscopic cholecystectomy for acutecholecystitis were comparable in terms of mortality, morbidity, and conversion rate. Delayed laparoscopic cholecystectomy should be preferred by surgeons for treatment of acute cholecystitis with the advantage of lesser drains, comparatively lesser blood loss, shorter duration of surgery and less pain in comparison to early laparoscopic cholecystectomy.

INTRODUCTION

Adult gallstone prevalence is anticipated to be between ten percent and fifteen percent, which makes it among the most prevalent gastroenterological disorders. Gallstones containing cholesterol make for eighty percent and ninety percent of stones that are examined following cholecystectomy in Western societies. About eighty percent of gallstones don't cause any symptoms. Gallbladder (GB) distension and biliary colic can result from gallstone obstruction of cystic duct. Extended blockage causes ischemia, infection, and inflammation; this is commonly referred to as acute cholecystitis (AC).[1,2]

Every year, one to two percent of those with gallstones experience symptoms). Ten percent ofthose having gallstones who have symptoms will have AC. Females are thrice as likely than males to acquire AC among those below fifty years of age.[1-4] More than ninety percent of instances of acute cholecystitis are caused by gallstones or biliary sludge which has impacted at the gall bladder's neck, which obstructs the cystic duct.

When the cystic duct is blocked, the gall bladder's intraluminal pressure rises and is combined with bile that has been supersaturated with cholesterol to create an immediate inflammatory reaction. The inflammatory reaction is mediated by prostaglandins I as well as E2, whose synthesis is stimulated by the trauma resulting from the gallstones.[4]

In order to contrast the effectiveness of early &

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delayed cholecystectomy among subjects with acute cholecystitis, this study was conducted.

MATERIAL AND METHODS

The present study enrolled 100 patients presenting with features suggestive of acute cholecystitis in surgical OPD and emergency of either gender. Patients were divided into two groups. If patient meets all criteria a) biliary colic b) pain radiating to back c) positive responseto sample analgesics then the patient underwent early cholecystectomy. If criteria were not met then the patient was selected as candidate for delayed cholecystectomy. Group I patients underwent early cholecystectomy and group II patients underwent delayed cholecystectomy. All enrolled patients were made aware of the study and their written consent was obtained. Ethical clearance was obtained from institutional ethical clearance committee.

STATISTICAL ANALYSIS

Data was entered in Microsoft Excel and analysed. Categorical data was expressed in number and percentage. Continuous data of normal distribution was expressed as mean and standard deviation. Skewed data was expressed using the median and interquartile range.

RESULTS

Table 1: USG findings

USG findings		Early group		Delayed group		p-value
		Number	Percentage	Number	Percentage	
Gallstones	Single	33	66	36	72	0.41
	Multiple	17	34	14	28	
Wall thickness (>4 mm)		50	100	50	100	1
Pericholecystic fluid		11	22	12	24	0.91

While assessing the USG findings, single gallstone was seen in 66 percent of the patients ofthe early group and in 72 percent of the patients of the delayed group while multiple gallstones were seen in 34 percent of the patients of the early group and in 28 percent of thepatients of the delayed group. wall thickness was more than 4 mm in 100 percent of the patients of patients of both early and delayed group. Pericholecystic fluid was seen in 22 percent of the patients of the early group and in 24 percent of the patients of the delayed group. Non-significant results were obtained while comparing the USG findings among early and delayed group respectively.

Table 2: Intraoperative findings

Intraoperative findings	Early group		Delayed group		p- value
	Number	Percentage	Number	Percentage	
Use of drain	36	72	23	46	0.001*
Conversion to opentechnique	6	12	7	14	0.135

*: Significant

On assessing the intraoperative findings, drain was used in 72 percent of the patients of theearly group and was significantly higher in comparison to delayed group where drain was used in 46 percent of the patients. In 12 percent of the patients of the early group and in 14 percent of the patients of the delayed group, surgical procedure was converted to open technique. Both the groups were comparable in terms of conversion rate to open technique.

Table 3: Duration of surgery

Duration of surgery(minutes)	Early group	Delayed group
Mean	102.9	83.8
SD	7.1	5.0
p-value	0.013 (Significant)	

Mean duration of surgery among patients of the early group was 102.9 minutes and was significantly higher in comparison to the patients of the delayed group (83.8 minutes).

Table 4: Blood loss

Blood loss (ml)	Early group	Delayed group
Mean	202.6	129.9
SD	33.9	7.5
p-value	0.002 (Significant)	

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Mean blood loss among patients of the early group was 202.6 ml and was significantly higher in comparison to the patients of the delayed group (129.9 ml).

Table 5: Postoperative VAS Score

Time interval (Hours)	Early group		Delayed group		p-value
	Mean	SD	Mean	SD	
1 hour	2.96	0.88	1.94	0.74	0.001*
12 hours	6.52	0.93	3.48	1.26	0.028*
24 hours	2.96	0.75	2.78	1.11	0.836
48 hours	1.54	0.65	1.28	0.85	0.141

*: Significant

Among patients of early group, mean VAS at postoperative 1 hour, postoperative 12 hours, postoperative 24 hours and postoperative 48 hours was 2.96, 6.52, 2.96 and 1.54 respectively while among patients of delayed group, mean VAS at postoperative 1 hour, postoperative 12 hours, postoperative 24 hours and postoperative 48 hours was 1.94, 3.48, 2.78 and 1.28 respectively. Mean VAS among patients of the early group was significantly higher at 1 hours postoperatively and 12 hours postoperatively in comparison to patients of the delayed group.

Table 6: Hospital stay

Hospital stay (days)	Early group	Delayed group
Mean	5.9	11.6
SD	0.86	1.19
p-value	0.001 (Significant)	

Mean hospital stay among patients of the early group was 5.9 days and was significantly lower in comparison to the patients of the delayed group (11.6 days).

Table 7: Postoperative complications

Postoperative complications	Early group		Delayed group		p- value
	Number	Percentage	Number	Percentage	
Fever	4	8	3	6	0.227
Bile leak	2	4	2	4	1
Basal pneumonia	1	2	1	2	1
Intra-abdominal collection	0	0	1	2	0.192
Wound site infection	1	2	0	0	0.896

Among the patients of the early group, fever, bile leak, basal pneumonia and wound site infection was seen in 8 percent, 4 percent, 2 percent and 2 percent of the patients respectively. Among the patients of the delayed group, fever, bile leak, basal pneumonia and Intra-abdominal collection was seen in 6 percent, 4 percent, 2 percent and 2 percent of the patients respectively. Non-significant results were obtained while comparing incidence of postoperative complications among the two study groups.

DISCUSSION

A significant fraction of digestive tract problems are biliary diseases. Among these is cholelithiasis, which need surgical intervention for a complete treatment since it causes generalized illness. Women are three times as likely than males to have gallstones. Prevalencerises with age, rising from 4% in the third to 27% in the seventh decade of life. Gallstones can have a serious side effect called acute cholecystitis. Research has been doneover the last few decades in a number of areas to provide less intrusive, unpleasant, and costly ways to treat gallstones. The quantity, size, and substance of the stones affect the effectiveness of such treatments as extracorporeal shock wave lithotripsy, contact dissolving agents, and oral desaturation agents. They also leave an undamaged gallbladder, which is known to contain lithogenic bile. Therefore, these nonoperative techniques cannot guarantee a long-term recovery from gallstone disease and are insufficient for a significant percentageof gallstone patients. Therefore, the preferred course of therapy for gallstone disease is still cholecystectomy. For more than a century, open cholecystectomy has been the preferred treatment for symptomatic cholelithiasis. Nonetheless, the development of the laparoscopic method for cholecystectomy in the past ten years has completely changed this process.[5-7]

Even acute patients were evaluated for laparoscopy since it was the gold standard therapy for chronic cholecystitis with cholelithiasis and surgeons were very skilled at conducting the procedure. On the liver bed, an edematous plane is produced by the acute inflammationlinked to acute cholecystitis. Either the

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edema extends into the Calot triangle or it ends at the gall bladder fundus, leaving the Calot triangle mostly free of inflammation. Neovascularity, fibrosis, and contraction occur when acute inflammation progresses to chronic inflammation, making laparoscopic cholecystectomy far more challenging and perhaps risky. Generally speaking, laparoscopic cholecystectomy should be carried out as soon as possible, ideally within the first 72 hours, for individuals who have acute cholecystitis. Trying to "cool off" the gallbladder before going into the surgery room is notbeneficial. The advice for treating acute cholecystitis is the same whether or not a laparoscope is used: receive treatment while it's still early. [5-7]

On assessing the intraoperative findings, drain was used in 72 percent of the patients of the early group and was significantly higher in comparison to delayed group where drain was used in 46 percent of the patients. In 12 percent of the patients of the early group and in 14 percent of the patients of the delayed group, surgical procedure was converted to open technique. Both the groups were comparable in terms of conversion rate to open technique.In the study by **Gupta G et al[8],** drains were used in 23 and 7 subjects of early and delayedgroup,respectively. In the study by **Goh et al[9],** conversion rates were higher in the early than that in the delayed group (early, 21.4% vs. delayed, 4.9%; p = 0.048). In the study by **Gupta G et al[8],** two patients in the early group (6.7%) and none of the delayed group required conversion to open surgery. In the study by **Madhura G et al[10],** delayed had more conversions to open surgery when compared with early. 32% of subjects in delayed had conversion to open where as in Early only 20% had conversion to open. **Gul R et al[11]** conducted a study in which drains were used in 19 and 9 subjects of early and delayed group, respectively. Conversion to open technique was seen in 3 and 4 cases of early and delayed group, respectively.

CONCLUSION

The safety and efficacy of early and delayed laparoscopic cholecystectomy for acute cholecystitis were comparable in terms of mortality, morbidity, and conversion rate. Delayed laparoscopic cholecystectomy should be preferred by surgeons for treatment of acute cholecystitis with the advantage of lesser drains, comparatively lesser blood loss, shorter duration of surgery and less pain in comparison to early laparoscopic cholecystectomy.

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