COMPARISON OF OUTCOME IN HOT VS COLD CHOLECYSTECTOMY.

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Abstract: Objective: Comparison of outcome in term of intra-operative and postoperative complications including intraoperative bleeding, mean operative time, need of conversion to open technique, postoperative pain, vomiting, infection, start and tolerance to oral diet and socioeconomic impact of both procedures. **Material and Methods:** A Prospective study was conducted. Patients were randomly divided into 2 groups. First group(group A) included patients who underwent surgery within 72 hours of presentation with acute symptoms and second(group B) group included patients who received conservative treatment and were discharged after resolution of symptoms and surgery was performed on readmission after about 6 weeks of initial episode. **Results:**No statistical difference was observed in both approaches in regard to need of conversion to open cholecystectomy, post operative pain and complications. As far as blood loss and intraoperative time was concerned it was significantly more in group A and mean hospital stay was far less in group A. **Conclusion:** Surgical intervention performed within early 72 hours of presentation is more beneficial both clinically and economically and should be preferred approach for management of patients with acute cholecystitis.

Key words: Cholecystomy, Gall Stone, VAS, Cholecystitis

INTRODUCTION:

A considerable section of digestive tract disease comprise of biliary tract disease which include stones in gallbladder termed as cholelithiasis. Gallbladder stones may be symptomless or they may be symptomatic because of inflammation of gallbladder generally known as cholecystitis which require surgical intervention for removal of gallbladder for complete resolution of symptoms.(1) Epidemiologically cholelithiasis has three times more incidence in women than men. Commonly known as the disease of 4F's, Female, Forty, Fertile, and Fat. The forty in these 4F'implies to age because the incidence of gallstones increases with increasing age as stated by meta nalysis that prevalence of gallstones disease increases from 4% in 3rd decade of life to as high as 27% in 7th decade of life.(2)

Cholecystitis is further divided into acute and chronic cholecystitis. Chronic cholecystitis is explained as swelling and irritation of gallbladder that continues over time most of the time caused by repeated attacks of acute cholecystitis due to gallstones. These attacks cause the wall of gallbladder to thicken, the gallbladder begins to shrink and lose its ability to concentrate, store and release bile. Acute cholecystitis on the other hand is sudden onset of symptoms due to inflammation

Article Citation: Raees A, Tariq A, Raees I, Saeed AB. Comparison of Outcome in Hot Vs Cold Cholecystectomy. Indep Rev Oct-Dec 2017;19(10-12): 172-178.

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Date received: 22/04/2017
Date Accepted: 22/02/2018

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most commonly caused by obstruction of gallbladder at its neck. A lot of research conducted in recent years for development of non-surgical approach to treatment of gallstones including pharmacological agents given orally to dissolve gall stones, contact dissolution agents and Extra Corporeal Shock Wave Lithotripsy(ECSWL) didn't provide promising results because of less acceptable results and an increase in complications like choledocholithiasis further intensifying the disease magnitude and leaving pathological gallbladder which have lithogenic bile inside body which is prone to make new stones. Therefore these methods were not included in practice. (3) Thus cholecystectomy is gold standard treatment for gallstone disease up to date.

Previously cholecystectomy was performed by open surgical approach by either upper right subcostal incision, Kocher's incision or modified Kocher's incision and it remained treatment of choice for more than 100 years. Laparoscopic cholecystectomy known to be first performed in 1985 by Muhe and later modified by Reddick and Oslan to the present technique in 1988 has brought revolution in treatment of cholecystitis. (4) Previously laparoscopic procedure was limited to elective cases to achieve objectives like earlier recovery, less pain and exceptionally good cosmetic results(5) in comparison to open cholecystectomy. In the introductory years of laparoscopy acute cholecystitis was considered to be a relative contraindication to laparoscopic cholecystectomy due to edematous changes because of inflammation increasing susceptibility to intraoperative complications. After revolution of laparoscopic procedures and with experience gained in cases of chronic cholecystitis surgeons introduced this technique to patients with acute cholecystitis and laparoscopic procedure became a normal practice in patients of acute cholecystitis with symptomatic disease.

Repeated episodes of acute cholecystitis lead to formation of new blood vessels, chronic inflammatory infiltrate including fibroblasts and myocontractile cells make adhesions and contractions creating difficulty in removal of gallbladder from its bed. Considering these changes patients presenting with episode of acute cholecystitis should be operated within 72 hours of presentation because the potential risks balance off in both approaches when considered with chronic inflammation. Thus the usual followed approach of cold cholecystectomy is under debate with more reasons against it and more reasons favoring hot cholecystectomy both in laparoscopic and non laparoscopic approach. (2)

Laparoscopic cholecystectomy for cases presenting with acute episode is usually deferred in present era because lack of convenient studies claiming superiority of cholecystectomy in acute presentation and because this matter is under controversy. (6) at the same time several studies in very recent period concluded that patients presenting with acute onset of symptoms should be operated as earlier as possible (7,8) which not only decreases morbidity but also lessen mortality which result from further complications because of pathological gallbladder with stones inside it.

This study was conducted to assess the safeness and expediency of laparoscopic cholecystectomy for patients presenting with acute episode of cholecystitis and conduct a comparison in terms of outcome in patients who underwent cholecystectomy after

resolution of acute attack by conservative management and then underwent cholecystectomy after 72 hours of acute episode usually on readmission to hospital for elective surgery after about 6 weeks. Factors which were made part of this study for comparison were safety, mean operative time, total blood loss, intraoperative complications, post operative pain and need of analgesia, mean duration of hospital stay, conversion to oral diet, cosmetic results and cost effectiveness of both procedures including return to normal activities defined in our studies as return to work and total days away from work.

Materials and Methods:

A prospective study was conducted in Faisalabad in both government and a few private setup hospitals from 1st March 2016 to 29th Feb 2017(total duration 1 year). No ethical issues were faced during this study.

The research included 70 cases (35 cases in each group). Patients were taken into confidence and decision to be classified in any group was left upon the patient with prior information about both approaches and their advantage and possible complications. Comparable characteristic patients were selected from both groups to make 35 patients in each group. All patients underwent laparoscopic procedure. Diagnosis of acute cholecystitis was confirmed after detailed history, physical examination, laboratory findings and ultrasonographic evidence of acute cholecystitis. Other investigations conducted were CBC, LFT's, RFT's, HBsAg, anti HCV antibodies, and ECG as part of protocol before surgery. Patients were managed according to their consent for early or delayed cholecystectomy. Patients with early procedure were operated within 72 hours of presentation and delayed group was managed conservatively and surgery was performed after 6 to 10 weeks. Initial management was same for both groups including NPO, intravenous fluid and intravenous antibiotics.

Inclusion Criteria:

- Patients with 1st episode of symptoms
- Patients with evidence of acute cholecystitis on history examination and USG.
- Patients with otherwise normal health having no other known chronic disease.

Exclusion Criteria:

- Patients with repeated episodes or presentation after 72 hours of onset of symptoms.
- Patients with clinical and laboratory evidence of jaundice due to increase bilirubin level or USG evidence of dilated bile duct due to obstruction by stone in bile duct.
- Age above 70 years and below 30 years.
- CA gallbladder or any other malignancy of surrounding structures.
- Clinical and investigations suggestive of pancreatitis including increase serum lipase and USG and CT suggesting edematous and inflamed pancreas.
- Previous abdominal surgery.
- Patients who did not give consent to undergo surgery or being part of study.

All patients were operated under general anesthesia with laparoscopic procedure. Mean Intra-operative time was noted, complication and need to convert to open cholecystectomy was recorded. Post operative pain was assessed by visual analogue score and need of analgesia, oral diet was introduced as soon as possible and time was noted and oral antibiotics were

prescribed in place of I.V antibiotics. Patients were discharged after they were vitally and clinically stable.

Clinical Presentation and laboratory findings of patients:

50 out of 70 patients presented with pain in Right Hypochondria (RHC), 20 patients had pain Epigastria. 26 patients were having Nausea and Vomiting in group A and 30 patients in Group B were having Nausea and Vomiting. Increase body temperature or hyperpyrexia was noted in 14 patients of group A and 13 patients of group B, therefore presenting complaints were statistically not significant and were comparable in both groups (p>0.05)

On Examination following findings were observed

Operative Details and Complications

A statistically prominent difference was observed regarding need to decompress gallbladder and placement of drain in sub-hepatic area but conversion rate to open procedure was comparable in both groups. Conversion were observed due to different reasons, as in group A conversion to open technique was deemed due to fragile gallbladder which ruptured when grasped and due to obscured anatomy because of inflammatory edema while in group B most conversions were due to adhesions making it difficult to identify structures in Calot's Triangle.

Visual Analogue Score for assessment of

Examination	Group A (Early Group)	Group B (delayed group)	P value
Tender RHC	35	35	1.000
Murphy's Sign	14	16	0.795
Fever	14	13	1.000
Jaundice	0	0	-

Comparison of Blood investigations revealed:

Investigations	Group A	Group B	P value
Hb < 10gm/dl	3	4	1.000
TLC >10,000/cumm*	15	17	0.796
Bilirubin >1mg/dl	7	3	0.472
Deranged AST**	6	6	1.000
Deranged ALT***	6	6	1.000
ALP****	5	3	0.706
Serum Lipase	0	0	-

*TLC : total Leukocyte count ** Aspartate transaminase *** Alanine Transaminase **** Alkaline Phosphatase

Radiological Findings in both groups:

Ultrasonographic Parameter	Group A	Group B	p value
Gallstones	35	35	1.000
Single	23	20	0.596
Multiple	12	15	0.596
Wall Thickness	35	35	1.000
Pericholecystic Fluid	9	9	1.000

Operative Modifications:			
Modifications	Group A	Group B	p value
Gallbladder Decompression	25	16	0.035
Subhepatic Drain	22	11	0.019
Need to Convert to Open Technique	4	5	1.000

post operative pain after 48 hours without opoid analgesic.

Post-Operative pain using Visual Analogue Scale was 7.34±2.014in group A and3±1.94 in group B. Male patients in group A had a pain of 7.36±1.63while the males in group B had a pain score of 3.52±2.11. Female patients in group A had a pain of 7.33±2.2 while the females in group B had a pain score of 2.21±1.37.

Mean operative time in group A was 92.32 minutes and in group B it was 72.16 minutes ($p<0.05$). Mean blood loss in group A was 165.10 ml and in group B it was 92.70 ml ($p<0.05$). Blood loss was approximated by measurement of suction chamber and deducting quantity of irrigation used during procedure. Oral diet was introduced at average of 12 hours in group A and 9.30 hours in group B. Total mean Hospital stay in group A was 4 days while in group B it was significantly higher of 10 days. Return to normal activities was observed at average of 14 days in group A and 21 days in group B (time included for duration of 1st admission to return to daily activities).

Result:

This research consisted of 70 cases (35 in group A and 35 in group B). Group A underwent cholecystectomy within 72 hours while group B underwent surgery after about 6 weeks. Both groups comprises of proportionate about age distribution. The mean age for patients in group A and group B was 37.83+-10.25 and 36.27+-10.82 years correspondingly. Gender distribution in both groups was 14 males and 56 females. Ratio 1:4. Distribution of gender in both groups was statistically not significant ($p>0.05$). No statistical difference was observed in both approaches in regard to need of conversion to open cholecystectomy, post operative pain and complications. As far as blood loss and intraoperative time was concerned it was significantly more in group A and mean hospital stay was far less in group A.

Discussion:

Laparoscopic procedures have brought revolution to the field of not only general surgery but also with gain of experience its application on specialties is increasing with every new day. As with many other procedures cholecystectomy is performed laparoscopically as part of standard treatment of symptomatic cholecystitis. In early days use of laparoscopic approach was not considered for emergency cases of acute cholecystitis [9] due to fear of increase risk of complications including injury to hepatic artery and CBD due to obscured anatomy by edematous structure by inflammation in triangle of calot's. After its common application in cases of chronic cholecystitis and in delayed approach cholecystectomy and gain of experience and expertise is application started in cases of acute cholecystitis and it was observed

that it is not contraindication to perform laparoscopic cholecystectomy in acute cases who undergo hot cholecystectomy. With time more reports emerged showing acceptability of laparoscopic procedure for cases of acute cholecystitis undergoing hot cholecystectomy with acceptable morbidity. [9,10]

In many studies it was concluded that laparoscopic cholecystectomy should be the preferred approach for cases of acute cholecystitis with advantage of early recovery, early return to normal activities without any additional morbidity. However in present era it has not gained application as a preferred approach towards cases of acute cholecystitis because of controversy of best time to embark on surgical intervention which is still under debate.[6]

In some studies rate of conversion to open procedure is reported to be higher ranging from 6% to as high as 35%[11,12,13,14,15] in cases of hot cholecystectomy. These results cover the advantages of early approach and direct to observations urging to perform cholecystectomy after conservative treatment or after resolution of acute inflammation making surgery easier and thus preventing high conversion rate making it a more acceptable approach for cases of cholecystitis. In our research these observations were not found and it was established that conservative management and later surgical approach is not associated with significant difference in conversion rate it was comparable in both groups with different reasons of conversion in both groups. In patients with acute cholecystitis who underwent early cholecystectomy by laparoscopic approach need of conversion was due to inflamed and edematous structures making it difficult to identify structures and due to rupture of fragile gallbladder when grasped. In patients in which acute episode was managed conservatively and delayed surgical approach was opted causes of conversion was obscured anatomy due to extensive fibrosis and adhesions.

An important consideration in study was incidence of bile duct injury during procedure which was not observed in both groups. 2 patients (6.66%) in group B were found to have complicated disease found at time of surgery due to stone slippage into CBD and it was later managed by ERCP. Modification in procedure were made according to situation, decompression of gallbladder should be considered when inflammation and edema obscure normal anatomy of surrounding structures. Similarly sub-hepatic drain may be used when required. In our study 25 patients in group A and 16 patients in group B underwent decompression to reduce distension and to visualize proper anatomy of calot's triangle.

Mean operative time was found to be significantly higher in group A as compared to group B in our research which is in alignment to studies conducted in past which may be explained due to operational modifications required in group A including decompression and suction and to remove omentum adhesions. The increase in blood loss in group A may be explained due to inflammation in case of acute cholecystitis however no patient required blood administration due to excessive loss. Mean hospital stay was significantly higher in group B as compared to group A because of need of readmission for surgery after prior admission treatment and discharge. Overall socioeconomic benefits in group A can be assessed with fewer days away from work, shorter hospital stay and early return to work and decrease requirement of pharmacological agents.

Conclusion:

The acceptability and effectiveness of both

approaches is equipollent in cases of acute cholecystitis in terms of complications and outcome. Both procedures have positive and negative factors with them. In patients with cholecystitis operated within 72 hours of admission have shorter mean hospital stay and earlier return to work with socioeconomic benefits but it comes at a cost of increase duration in surgery , increase blood loss, moreover it prevent repeated episodes of symptoms and reduce morbidity and reduce incidence of preoperative complications. Thus it can be deducted that hot cholecystectomy have comparable outcomes when compared in different regards with cold cholecystectomy therefore it should be considered a preferred advent in treatment of patients with acute cholecystitis by experience surgeons in laparoscopy.

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