

STUDY OF ADVANTAGES OF MINILAP-CHOLECYSTECTOMY

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Background- In the current era, cholecystectomy is the safest, most effective and widely recommended treatment for gall stone disease. Different methods available are: standard conventional cholecystectomy (CC), laparoscopic cholecystectomy (LC), minilap- cholecystectomy (MC), and natural orifice transluminal endoscopic cholecystectomy (NOTE-C). NOTE-C is in its infancy. LC has overtaken open cholecystectomy as the method of choice. However, laparoscopic facility is not available in large parts of third world countries due to deficiency of money, man, machine at many district hospitals and some tertiary level hospitals. Methods- Between September 2008 and February 2013, in a tertiary care hospital this study was carried out in two groups (CC and MC) of 40 patients each. Our surgical access for MC was by using average 5.5cm (4.5 to 6.5cm) transverse incision involving the Murphy's point with rectus retracting technique. The incision for CC was either standard Kocher's subcostal incision or right paramedian incision. Cholecystectomies were done either by fundus first or by retrograde method. Different perioperative and postoperative observations and postoperative complications were noted in both groups and compared. A review of relevant data of LC from the available literature was made so as to infer the validity of MC over CC and LC. Results- MC could be completed successfully although two cases needed extension of incision- one for morbid adhesion and one for CBD exploration. The average operating time was 70min, 60min; blood loss 90ml, 110ml; dose of analgesia 3.5, 7; duration of iv fluid 24-48 hrs, 36-72 hrs; hospital stay 3.5 days, 7 days; and return to work 2 weeks, 3 weeks in MC and CC respectively. The recovery was faster and the cosmetic result was acceptable in MC group but not in CC group. Postoperative complication was more in CC group. Mortality was nil in both the groups. The data on LC from literature are almost similar to that of MC. Conclusion- The advantages of MC scores over CC and the benefits come close to that of LC for which minilap-cholecystectomy can be considered as a good and feasible option for cholecystectomy in centers where money, man and machine are constraints to laparoscopic cholecystectomy.

KEYWORDS

Minilap Cholecystectomy, Micro-Cholecystectomy, Conventional Cholecystectomy, Laparoscopic Cholecystectomy.

INTRODUCTION:

Till today cholecystectomy is the treatment of choice for symptomatic cholelithiasis. Since first successful cholecystectomy performed by Carl Langenbuck of Berlin in 1882 open cholecystectomy had been the gold standard for over a century. The need for minimal access could lead to minilap cholecystectomy, the term first coined by Dr Samuel R Goco and first described by Dubois and Berthelot in 1982, which is virtually the same as conventional cholecystectomy except for a smaller incision (4-6cm) through right transverse subcostal approach. With technology advancement Prof (Dr) Med Erich Muhe of Boblingen in 1985 performed the first laparoscopic cholecystectomy which gradually overtook open cholecystectomy as the method of choice. In the current era different methods of cholecystectomy available are: standard conventional cholecystectomy (CC), laparoscopic cholecystectomy (LC), minilap-cholecystectomy (MC), and natural orifice transluminal endoscopic cholecystectomy (NOTE-C). NOTE-C is in its infancy. Laparoscopic facility is not available in large parts of third world countries due to high cost of treatment (money), lack of technical expert (man) and non-availability of technology (machine) at many district hospitals and some tertiary level hospitals. The hospital selected although a tertiary care one, was also not having a laparoscopic set during the period of study. This study was, therefore, undertaken to substantiate the claim of superiority of minilap cholecystectomy over conventional cholecystectomy and to assess whether this is sustainable or not in this laparoscopic era.

PATIENTS AND METHODS:

From September 2008 to February 2013 a comparative prospective study was carried out in the department of General Surgery, V.S.S. Medical College, Burla, Sambalpur, Odisha after prior approval of our Institutional Ethics Committee. The patients were divided into two groups of 40 patients each: the standard conventional choecystectomy group (CC) and minilap-cholecystectomy group (MC).

Inclusion and exclusion criteria:

1. Patients of all ages having calculous acute and chronic

cholecystitis with no other surgically correctable gastrointestinal disorder were selected. To rule out the associated upper gastrointestinal disorder, upper GI endoscopy was done in suspicious cases.

2. Patients with obstructive jaundice due to CBD stone were selected excluding that due to malignant condition by USG or CT scan of abdomen.

3. Very obese patients were not included in either of the groups to avoid sampling bias as we did not select those patients for MC. But preobese (BMI 25-29.99) and class I obese (BMI 30-34.99) patients were selected.

4. For fair comparison, patients with cardiovascular disorder with ECG changes or associated other severe co-morbid conditions were excluded.

After thorough history taking and specific investigations, all selected patients were subjected to targeted investigations for preanaesthetic check up. Routine preoperative preparation was done in all patients and additional vitamin K, 10% Dextrose and adequate hydration to ensure optimal urination in obstructive jaundice patients.

All the patients were operated under general anaesthesia. The CC group of patients was operated by making traditional 10-15cm Kocher's incision. For MC group, a transverse 4.5-6.5cm incision was made 2 finger right to midline and 2 fingers below right subcostal margin. Rectus muscle was retracted medially with a Langenbuck retractor. Distended gall bladder was aspirated before dissection. Single sponge holder was used to hold the gall bladder. If required, a stay suture was applied to the fundus of gall bladder for traction and brought out through a separate puncture in an appropriate location on the pariety. Rest of the steps remained same as for CC. Patients were followed up initially after 1 month and 6 monthly thereafter upto 2 years.

Relevant preoperative, perioperative and postoperative data were recorded and analysed in terms of range, mean and percentage. As the laparoscopy facility was not available in our institution during the period of study, a review of relevant data of LC from the available literature was done and discussed to know the sustainability of MC in this laparoscopic era.

RESULTS:

Overall, 80 cholecystectomies were done during the period of study in two groups; 40 CC and 40 MC. Maximum incidence of symptomatic cholelithiasis was between 31-40 years of age (45%) and another 30% belonged to 41-50 years of age; youngest being 14 years and oldest 65 years old. Male to female ratio was 1:3. USG and LFT were done in all cases, UGI endoscopy in 75% of cases and Plain X-ray KUB in 67.5% of cases. CT scan was required only in 7.5% of patients. Biliary tract conditions diagnosed preoperatively were: Chronic calculous cholecystitis (58 cases, 72.5%), Chronic cholecystitis with choledocholithiasis (6, 7.5%), Mucocele gall bladder (4, 5%), Acute calculous cholecystitis (8, 10%) and Empyema gall bladder (4, 5%). MC was performed alone in 38 patients and combined with CBD exploration in 2 patients. CC was done alone in 37 cases and combined with CBD exploration in 3 cases.

In MC the mean operating time was 70 min (60-85 min), average blood loss was 90 ml (80-100 ml), average dose of analgesic was 3.5 (3-4) and iv fluid was required upto 24-48 hrs after operation, all were ambulatory after 24 hrs, mean hospital stay was 3.5 days (2-6 days), all returned to work after 2 weeks and the cosmetic result was acceptable to young females. MC could be completed successfully in all cases except two (5%) that needed extension of incision- one for morbid adhesion and one for CBD exploration.

In CC the mean operating time 62 min (50-80 min), average blood loss was 110 ml (100-120 ml), average dose of analgesic was 7 (6-8) and iv fluid was required upto 36-72 hrs after operation, all were ambulatory after 48 hrs, mean hospital stay was 7.3 days (5-9 days), they returned to work after 3 weeks and the long scar was not acceptable to young females.

In acute cholecystitis cases (3 in MC and 5 in CC group) there was no difficulty in either group; mean operating time was 75 min vs. 70 min and no bile duct injury was observed in any. In MC group all were operated in retrograde manner.

Post-operative symptoms were more common in CC than in MC viz. vomiting 30% vs.15%, pain 35% vs. 10%, prolonged (>3 days) ileus 5% vs. nil, bile leakage 5% vs. nil and wound infection 10% vs. 5%. Late complications in CC compared to MC are anaesthesia at or below the site of incision 25% vs. 5%, painful scar 20% vs 5%, hypertrophic scar 5% vs. nil. Post-cholecystectomy syndrome was 5% in both cases and neither bile duct stricture nor incisional hernia was not observed in either group during follow up period.

DISCUSSION:

The gall stone disease is second most common abdominal problem after acute appendicitis. Symptomatic gall stone disease requires cholecystectomy. Carl Langenbuch performed first cholecystectomy through a T- shaped incision; subsequently Kocher modified the incision to a right subcostal form of 10-30cm long^{1,2}. The dicta "The way to hell is paved with small incisions", "I do not enter through windows, I enter through doors" and "Big surgeon always give big incisions" are replaced in the present era by minimally invasive surgery. Now patients want less discomfort, less hospital stay, better results and best cosmesis with less expenditure. To reduce the morbidity and to avoid ugly scar the surgeons decreased the length of visible scar from 5-6 inches (CC) to 5-6 cm (MC) to 1 cm (LC) or even to a totally scar-less surgery (NOTE-C). NOTE-C has not yet gained popularity. The gold standard LC is costly and needs expertise and is not available in many district centres and some medical colleges including ours during the study period. The present study was undertaken with intent to judge the results of this minimally invasive technique MC.

Mini-lap cholecystectomy can be offered to any symptomatic gallstone case even with CBD stones and high-risk medical problems in any general hospital where surgical facilities are available. In this randomized controlled study MC was compared with CC and literatures on LC was reviewed.

The age and sex incidence of present series is comparable to studies by other Indian authors³. No difficulty was faced with 4.5-6.5 cm transverse rectus splitting incision similar to study by Dedawoo et al.³ except two that needed extension of incision only. Chalkoo modified the incision to a 3-5 cm oblique muscle cutting incision⁴. Some have used self illuminating narrow but deep retractors and clips instead of sutures⁵.

MC required little more operating time than CC (in contrast to observations by other authors^{6,7}) which improved over time of learning, but has significant advantages over CC as regards the blood loss, dose of analgesic and antibiotic, intravenous fluid requirement, early ambulation, hospital stay, return to active life, cosmesis and post-operative complications are concerned comparable to observations by many ^{3,8,9}.

In acute cholecystitis, MC and CC showed no significant differences with regard to operating time, operative difficulty and complication rate was observed similar to the findings by Watanapa¹⁰. MC can also be undertaken under local anaesthesia in selected patients with no acute inflammation in patients with BMI <24 and with no history of previous abdominal surgery¹¹.

Although LC is gold standard but having limitations in acutely inflamed gall bladder, frozen Callot's triangle and associated choledocholithiasis¹². LC takes longer time to perform than MC and has no significant advantage in terms of hospital stay or postoperative recovery and both have been accepted as effective minimally invasive procedures for non-acute gall stone disease as reported by Majeed¹³. Avoiding the need for a special instrument improves the cost-effectiveness of MC10. Non-availability of equipment and trained man power with risk of iatrogenic complications further limits the LC. Sharma AK et al reported in 737 cases of MC the mean operating time (61.6 min), conversion rate (4%), postoperative complications (3.6%), bile duct injuries (0.3%), analgesic doses (3.4), postoperative hospital stay (1.4) and the time off work (13.3days) and no biliary stricture after 28.4 months of 93% of patients suggesting MC to be considered safe, viable alternative to LC in the third world $^{\rm 14}$. Rozsos in his study on 2400 cases concludes that outcome measures regarding mortality (0.12%), common bile duct injuries (0.8%), conversion to incision longer than 8cm (only 0.29%) and synchronous choledocholithotomy (5.5%) as well as complete cholecystectomy (98.1%) indicate MC to be safe and less expensive than either LC or CC¹⁵.

CONCLUSION:

Minilap cholecystectomy is superior to conventional cholecystectomy with regards to early postoperative recovery, cosmetic value, lesser postoperative complications, feasibility, safety, cost effectiveness, possibility under local anaesthesia, early resumption to work and benefit to majority who cannot afford for laparoscopic surgery. Although laparoscopic cholecystectomy has better cosmesis, postoperative recovery and early return to work but possess serious complications and requires special equipments and training as even its proponents confess.

Hence, minilap cholecystectomy is definitely a better option to conventional cholecystectomy and a viable alternative to laparoscopic cholecystectomy particularly for rural population in developing countries like India and in urban areas where laparoscopy set is yet to be available or where the patients cannot afford for it or where there is dearth of properly trained surgeons.

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