

Retrospective Evaluation of Laparoscopic Cholecystectomy Versus Open Cholecystectomy in Geriatric Patients with Acute Cholecystitis: A Comparative Study

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ABSTRACT

Background: Cholecystitis is inflammation of gall bladder. More than 90% of acute cholecystitis is from blockage of cystic duct by a gallstone. The main objective of this study is to compare the result of laparoscopic with open cholecystectomy in treatment of acute cholecystitis.

Materials and Methods: It is a retrospective study of 90 Patients of cholelithiasis aged 55± 10 years operated during 2013-2015 in Department of Surgery, Rama Medical College Hospital & Research Centre, Hapur, Uttar Pradesh, India. They were divided into two groups, first group consists of 48 patients who underwent laparoscopic cholecystectomy (LC) and second group includes 42 patients who underwent open cholecystectomy (OC) for acute cholecystitis. Patient's written valid informed consent for the particular procedure was taken and the pros and cons of both the procedure were explained in detail to the patient.

Result: The data and co-morbidities were comparable between the two groups. The postoperative hospital stay was significantly shorter for patients undergoing laparoscopy (P=0.03). The overall morbidity rate was lower for patients undergoing laparoscopy (P<0.05). There was no statistical significant difference in the mortality rate. There was no major bile duct injury for patients in either group. During the study period operation time for laparoscopic cholecystectomy showed a tendency to become shorter. The use of injectable

analgesics in case of laparoscopic cholecystectomy is less than open cholecystectomy.

Conclusion: Laparoscopic cholecystectomy is better than open cholecystectomy in terms of post-operative pain, analgesic requirement and early return to work and is safe procedure for acute cholecystitis in elderly patients, resulting in fewer complications and shorter stay hospital than open cholecystectomy. LC is safe procedure in both adult and middle aged patients causing less pain and hospital stay along with speedy recovery.

Keywords: Laparoscopy, Cholecystectomy, Elderly, OC, LC.

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INTRODUCTION

Cholecystectomy is the surgical removal of the gallbladder. It is a common treatment of symptomatic gallstones and other gallbladder conditions. Surgical options include the standard procedure, called laparoscopic cholecystectomy, and an older more invasive procedure, called open cholecystectomy. About 600,000 people receive a cholecystectomy in the United States each year.¹ In Italian survey of cholecystectomies showed that about 100,000 people undergo the procedure in Italy each year,¹ with a complication rate between 1 and 12%. In a study of Medicaid-US covered hospital in 2012, cholecystectomy was the most common operating room procedure.²

Indications for cholecystectomy include:

1. Inflammation of the gall bladder
2. Biliary colic
3. Gall bladder cancer
4. Pancreatitis caused by gall stones
5. Biliary dyskinesia
6. Choledocholithiasis
7. Prophylactic cholecystectomy during intraabdominal procedures
8. Parasitic infestation of gall bladder like in Ascariasis
9. Perforated or gangrenous gallbladder

Cholecystectomy is the recommended treatment the first time a person is admitted to hospital for cholecystitis.³ Cholecystitis may be acute or chronic, and may or may not involve the presence of gall stones. Some common indications for forgoing laparoscopy and proceeding with open operation are as follows:

1. Suspected or confirmed gall bladder cancer
2. Type 2 Mirizzi syndrome (cholecystobiliary fistula)
3. Gallstone ileus
4. Severe cardiopulmonary disease.

The main objective of this study is to compare the result of laparoscopic with open cholecystectomy in treatment of acute cholecystitis.

MATERIALS AND METHODS

It is a retrospective study of 90 Patients of cholelithiasis aged 55± 10 years operated during 2013-2015 in Department of Surgery, Rama Medical College Hospital & Research Centre, Hapur, Uttar Pradesh, India. 48 patients aged 55 years or older with acute cholecystitis undergoing LC were selected. 42 Patients in the same age-group undergoing OC for acute cholecystitis during the same period were selected for comparison.

The diagnosis of acute cholecystitis was confirmed by ultrasound study with evidence of a thickened gallbladder wall and pericholecystic fluid. All patients who were treated with intravenous antibiotics at the time of admission to hospital, once the diagnosis was made, were selected for the study. Laparoscopic cholecystectomy was performed using a standard four-port technique and an additional port was used when

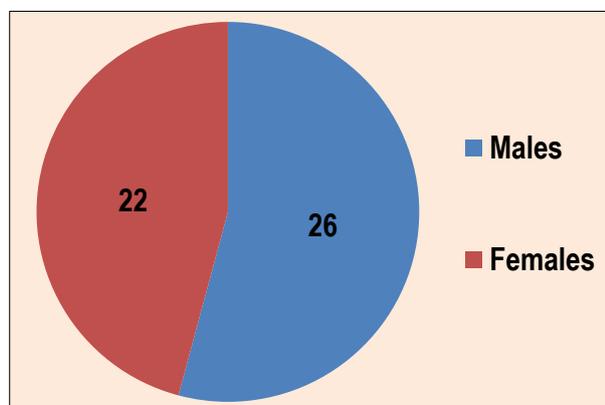
indicated. Diet was resumed when bowel sounds return⁴ The selection of patients for laparoscopic or open surgery entirely depended on the experience of the operating surgeon at performing laparoscopic surgery—the age and medical condition of the patients had no influence on the treatment approach. Procedures such as omental patch repair of perforated peptic ulcer or truncal vagotomy and pyloroplasty.

Patients were admitted a day prior to surgery and complete investigations performed required for general anesthesia. Investigations performed in these patients include Haemogram, Blood sugar level, Urine examination, Liver function test, Blood urea and serum creatinine level, Chest x-ray, ECG and Ultrasonography of abdomen.⁵

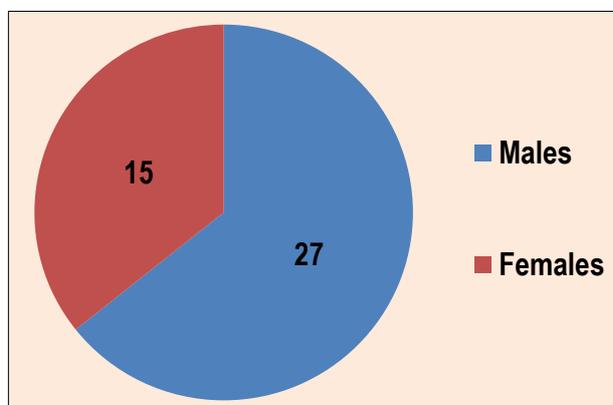
After complete investigations and after satisfying the inclusion and exclusion criteria for our study patients were subjected to either open or laparoscopic cholecystectomy depending upon draw of lots. First dose of antibiotics administered to the patient just prior to incision, immediately after intubation. Nasogastric tube is inserted routinely irrespective of the nature of operation. General anesthesia was administered to all the patients. Foleys Catheterization and Ryle’s tube insertion was done in all patients. Broad spectrum antibiotics (Inj cefotaxim). Injection amikacin and Injection Metronidazole were added in cases of bile leak. Analgesics in the form of Injection was given. Discharge after start of oral diet and without any signs of postoperative wound infection after first dressing change. Appropriate antibiotics started after reports and wound care taken accordingly. Follow up in OPD for stitch removal after 7 days, if operative wound is healthy.

Table 1: Patient characteristics

| Characteristics | Laparoscopic cholecystectomy | Open cholecystectomy |
|------------------------------|------------------------------|----------------------|
| Mean age (SD) [years] | 62.5 | 57.4 |
| Number of patients | 48 | 42 |
| Post-operative hospital stay | 3 days | 5 days |
| Medical condition present | 28% | 14% |
| Duration of surgery | 58.4 mins | 49.5 mins |
| Post-operative complication | 2 | 12 |



Graph 1: Gender Distribution in Laparoscopic cholecystectomy



Graph 2: Gender Distribution in Open cholecystectomy

RESULTS

Out of 90 patients; 48 undergo LC and 42 undergo OC. In LC group male: female is 26:22 and OC group it is 27:15. The mean age of patients in LC group was 62.5 and in OC group was 57.4. The mean operation time for Laparoscopic cholecystectomy was significantly longer than for Open cholecystectomy. (table 1)

The median (range) operation time for laparoscopic cholecystectomy was 58.4 min and 49.5 min for open cholecystectomy (p<0.001). During the study period operation time for laparoscopic cholecystectomy (LC) showed a tendency to become shorter. It has been observed that post-operative pain and analgesia required were significantly less in LC group

than OC group. The mean post-operative hospital stay was 3 days for LC and 5 days for OC. Therefore, OC group had significantly less hospital stay than LC group. Conversion of laparoscopic to open cholecystectomy occurred in 4 of the total number of patients i.e. 6% of initially scheduled to undergo LC. Two cases of LC were converted to open surgery due to bile duct injury and one due to intraoperative hemorrhage. In open cholecystectomy group largest number of complications were due to wound infections number is higher as compared with LC. Postoperative ileus was present in 5 patients of OC group necessitated the need for continuation of nasogastric decompression. Three patient from open group developed chest infection post operatively. The Post-operative pain and use of analgesics in case of LC (Mean=2 days) is considerably less than OC.

DISCUSSION

The prevalence of cholelithiasis and the incidence of complications would be expected to increase with age, therefore biliary surgery is performed more frequently for elderly patients. There is no doubt that LC is the treatment of choice for elderly patients with symptomatic cholelithiasis since the outcomes are better than those of OC in terms of lower morbidity rate and shorter hospital stay.⁶ In clinical practice, patients with acute cholecystitis are less likely to undergo LC than those with non-acute disease. Such a low LC rate may be a reflection of the technical difficulty of the procedure, concern about increased risks of bile duct injury, and inexperience with advanced laparoscopic surgery.⁷ High prevalence of co-morbidity, elderly patients admitted in an emergency are less likely to undergo LC. Benefits of minimally invasive or laparoscopic procedures include less post-operative discomfort since the incisions are much smaller, quicker recovery times, shorter hospital stays, earlier return to full activities and much smaller scars. Furthermore, there may be less internal scarring when the procedures are performed in a minimally invasive fashion compared to standard open surgery.⁸

Since laparoscopy surgery results in less pain and a speedy recovery, more and more patients without symptoms are advised to have a cholecystectomy to prevent possible later complications. For this button-hole surgery, an optical instrument, like the periscope on a submarine, is inserted through a small cut in the abdomen.⁹ This allows the surgeon to view the abdominal organs directly and he can also see the whole operative area on a TV screen. The problem is that little holes in the abdomen can, on occasion, trigger catastrophic problems for patients. The most devastating complication is injury to the common bile duct, the small tube that carries bile from the gallbladder to the small bowel. Injury to the CBD means jaundice, and if it's not treated, results in death.¹⁰

Gallstone disease is a benign condition because 70-90% of patients remain asymptomatic. Several studies have shown that the natural history of incidentally discovered gallstone is not only benign but even when they do develop complications; it is usually preceded by biliary pain.¹¹ Studies on long-term follow-up of individuals with asymptomatic gallstones have shown that over a 20-year period only 20% will develop biliary pain and the mean probability of developing pain is only 2% during the 1st five years, 1% during the 2nd, 0.5% in the 3rd and 0% during the 4th five years.¹² In other words, the longer the stones remain

asymptomatic, the less likely it is that complications will occur. In about 30%, patients who have had pain do not have further episodes of pain. Thus, for persons with asymptomatic gallstones, the natural history is so benign that not only treatment but also a regular follow-up is not recommended, resulting in an increase (of up to 60%) in cholecystectomies worldwide.¹³ Laparoscopic cholecystectomy in young patients is safe with greater patient acceptance.¹⁴

There are very few instances when laparoscopic surgery is not preferable to conventional surgery for cholecystectomy.¹⁵ The only real contraindication is if the anaesthetic risk is too high. Other lesser contraindications - such as during the first trimester of pregnancy - need not pose a problem to the experienced laparoscopic surgeon.¹⁶⁻¹⁹

It has been stated that diabetic patients are particularly prone to biliary complications from their stones.²⁰ This led some authors to advocate prophylactic cholecystectomy in asymptomatic diabetic patient. Sometimes consideration is given to perform an incidental cholecystectomy in addition to the planned operation in patients with asymptomatic gallstones.²¹ The purpose would be to prevent postoperative cholecystitis or the later development of symptoms. Patients having multiple gallstones Conversion rates in laparoscopic cholecystectomy ranges from 3% to 15% in well trained hands. In our series conversion rate is 6%; only 2 cases were converted to open because of common bile duct injury and and intraoperative hemorrhage.²² Common risk factors for conversion are male gender, obesity, cholecystitis (especially after 2 to 3 days after onset of symptoms) and choledocholithiasis.

Wound infection in open procedure is 3 times the laparoscopic procedures. Jatzko et al. in their study observed that grade I complications rate is lower in laparoscopic cholecystectomy group (0.3%) as compared to open cholecystectomy group (5.1%).²³ Butt AU et al conducted a study on twelve LCs (4.0%) required conversion. History of acute attack for more than 72hrs was a strong predictor of conversion even if patient has minimal signs and symptoms. The conversion rate was only slightly changed. The conversion rate over the last 6 years has decreased with no incidence of intraoperative complications. Age \geq 50 years, male patients and acute cholecystitis are the major predictors of conversion.²⁴ Barone JE et al. in Toronto group study also observed that number of complications in laparoscopic cholecystectomy were significantly less than number of complication in open cholecystectomy.²⁵ Siddiqui et al. in their study observed that frequency of wound infection was three times common in open cholecystectomy as compared to laparoscopic cholecystectomy in acute cholecystitis.²⁶ For elderly patients, many of whom have limited cardiopulmonary reserves, laparoscopic surgery could increase the morbidity and mortality of surgery. Laparoscopic surgery has been theoretically associated with compounding cardiac problems because the intra-abdominal pressure coupled with head up position results in pooling of blood in legs, reduced venous return, hypotension and increased tendency to develop venous thrombosis. Pressure effects of Carbon dioxide gas insufflated, may have effect on venous return, the heart rate and rhythm, basal lung expansion, carbon dioxide retention and acidosis. One of the possible disadvantages of laparoscopic cholecystectomy in acute cholecystitis is longer operating time when compared with open cholecystectomy.²⁷

CONCLUSION

Laparoscopic cholecystectomy is a safe procedure for acute cholecystitis in geriatric patients with a lower morbidity rate and shorter hospital stay than OC. However, OC is preferred method for Surgeons in the beginning of their career and in cases of difficult cholecystectomy.

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