



A Comparative Study of Open Versus Laparoscopic Cholecystectomy

KEYWORDS

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ABSTRACT *Background: In recent time laparoscopic cholecystectomy has been established as the popular alternative to open cholecystectomy, but it should have a safety profile similar to or better than that of open procedure. The purpose of present study was to compare the safety and efficacy of laparoscopic cholecystectomy in comparison with open cholecystectomy. Methodology: The present study comprised of 80 patients who underwent open and laparoscopic cholecystectomy. All cases underwent detailed preoperative assessment, their preoperative findings and post-operative data was meticulously recorded as per protocol. Results: The age and sex distribution of the whole series corresponds fairly well with the usual age and sex affection of gallbladder disease. Overall there was a female preponderance and the peak age group of patients involved was of 3rd and 4th decade. Two cases were converted from laparoscopic to open cholecystectomy, as the anatomy of calot's triangle was not delineated. The mean operative time in laparoscopic group was 97.53 min compared to 70.08 min in open cholecystectomy group. Conclusion: Laparoscopic cholecystectomy reduces the number of antibiotic and analgesic requirement, hospital days, wound infection except for the prolonged operative time, which can be minimized in due course of time as the learning curve progresses.*

INTRODUCTION

Gastro-intestinal surgery has undergone a revolution in the recent years by the introduction of laparoscopic techniques. The revolutionary nature of this procedure has been unprecedented in surgical history, and has been compared to such surgical mileposts as the development of vascular surgery and organ transplantation. The concept of "keyhole surgery" created an immediate disparity between the potential of the new technique and training of surgeons to perform it. Now modern surgical methods are aimed at giving cure along with minimal invasive techniques with patient in mind, safety never being compromised¹.

Archaeological studies demonstrating the presence of gallstones in Egyptian mummies have confirmed that cholelithiasis has plagued mankind for over 2000 years and which continues to be one of the most common digestive disorders encountered. Since ages conventional or open cholecystectomy has been the gold standard for surgical management of cholelithiasis.

Karl Langenbuch in 1882 quoted, "The gall bladder should be removed, not because it contains stones but because it forms them". With the introduction of laparoscopic cholecystectomy, the surgical community witnessed a revolution in basic ideology and the importance of minimal access surgery¹.

Benefits of this approach include reduced hospitalization and associated cost, and reduced post-operative recovery

time with an early return to work. Although it showed early promising results, recent trials show an increase in the incidence of operative complications, especially biliary duct injuries, expensive instruments, specialized training that is mandatory for mastery of the technique and a long learning curve also limit the use of laparoscopy and the procedure inherently carries hazards and risks².

This has led to numerous attempts at comparing the merits and demerits of laparoscopic vis-a-vis open cholecystectomy as many questions regarding this procedure remain unanswered, particularly relative to the gold standard procedure of open cholecystectomy³. In our study, we have made an attempt to compare the advantages and drawbacks of both the procedures in our medical college

MATERIALS AND METHODS

This is a prospective study conducted in Padmashree Dr. D.Y. Patil Medical College, Pimpri, Pune from the duration of July 2012 to September 2014. Institute Ethics Committee clearance was obtained before the start of study. The patients were divided into 2 groups. Group A included 40 patients undergoing elective open cholecystectomy. Group B included 40 Patients undergoing elective laparoscopic cholecystectomy. First case was selected by lottery method and the next cases were allotted to each group alternately. Written and informed consent of patients was obtained before starting the treatment. All patients with cholelithiasis proven by USG in the age group 18 - 70 years were included in the study. Patients with age above 70 years, with Diabetes mellitus, Tuberculosis, AIDS, on immunosuppres-

sive therapy and steroids, with acute gallbladder perforation peritonitis, Carcinoma gallbladder.

A detailed history of each patient was obtained starting with history of presenting symptoms and any co-existing co-morbid conditions like, DM, HTN and TB were ruled out. A thorough general physical examination was done to rule out presence of pallor, icterus and cachexia.

All cases were elective surgeries. All operations were done under General anaesthesia.

Informed and written consent were obtained and intra operative procedures accordingly open & Laparoscopic cholecystectomies were performed. The wounds were closed with absorbable sutures. In open cholecystectomy muscles were closed with vicryl number 1. Ryle's tube number 16 was kept as abdominal drain in both groups. Skin was sutured with ethilon 2-0 in both groups. Duration of surgery noted in both groups. Intraoperative complications if any noted in both groups. Postoperatively patient were kept NBM for 24 hrs followed by starting oral liquids for both the groups. Nasogastric tube was removed after 24 hrs of surgery. Drain was removed after 48 hrs in both groups. Wounds were checked for infection on 3rd day in both groups and dressing done. If there was a discharge or collection at the suture site then a suture was opened according to site of collection and discharge collected in sterile container and sent for culture and sensitivity to microbiology department. Laparoscopic cholecystectomy patient's discharged on 7th post-operative day after suture removal. Open cholecystectomy patient's suture removal done on 11th post op day and patients were discharged after suture removal.

Data was collected prospectively and including patient's demographics, rate of conversion to open cholecystectomy, operating duration (from incision to closure), operative complications, postoperative pain, analgesia administration and length of hospital stay. The histopathology of the specimen was noted.

OBSERVATIONS AND RESULTS

In open cholecystectomy (Group-A) there were 14 males and 26 females. In lap cholecystectomy (Group-B) there were 13 males and 27 females. Maximum were females as compared to males.

In open cholecystectomy (Group-A) mean age was 39.03 yrs. In lap cholecystectomy (Group-B) mean age was 33.13 yrs. Maximum patients belonged to 3rd and 4th decade of life with 62.5% cases of open cholecystectomy. (Group-A) and 82.5% cases of lap cholecystectomy (Group-B) belonging to this period.

In open cholecystectomy procedure minimum and maximum duration was 50 minutes and 90 minutes with mean duration of 70 minutes. In lap cholecystectomy procedure minimum and maximum duration was 70 minutes and 140 minutes with mean duration of 97.45 minutes. The time taken was generally more in laparoscopic surgery than in open cholecystectomy. In open cholecystectomy patients, duration of analgesic requirement was minimum 3 days to maximum 5 days with a mean of 4.20 days. In lap cholecystectomy patients, duration of analgesic requirement was minimum 2 days and maximum 8 days with a mean of 2.23 days. The difference between use of post-operative analgesia in case of OC group compared to LC group is statistically significant. Minimum and maximum duration for

return to normal work in open cholecystectomy group patients was 12 and 18 days with mean of 14.10 days. Minimum and maximum duration for return to normal work in lap cholecystectomy group patients was 8 and 20 days with mean of 8.5 days. Both mean values are statistically significant.

Table 9.1:- Complications wise distribution of cases in Group A and Group B

Intraoperative complications	Group A (n=40)	Group B (n=40)	Z Value	P Value
Haemorrhage	6 (15%)	2 (5%)	2.61	<0.01
Bile spillage	4 (10%)	2 (5%)	1.51	>0.05

30% of patients who underwent open surgery had complications and 12.5% of patients who underwent laparoscopic surgery had complications.

Haemorrhage was from the GB fossa, bile spillage was during dissection in GB fossa due to accidental opening of gallbladder wall for which a thorough wash was given with normal saline. The overall percentage of complications was lesser in laparoscopic surgery than open surgery.

DISCUSSION

Retrospective randomized studies were done by Supe AN et al using 50 patients in each category⁴. Other retrospective randomized studies were also done by Carbajo Caballero MA et al, Verma GR et al and Stevens HP et al^{5,6,7}. Prospective studies were conducted by Foster D.S et al, but not taking acute and emergency cases into account.⁸

In our study 40 cases each for laparoscopic and open surgery were selected in such a way that none of the patients suffered from emergency conditions like empyema etc and none of them had jaundice.

The time taken for laparoscopic surgery was found to be more than open cholecystectomy according to Supe AN et al.⁴

According to Waldner H et al there was no significant time difference between both the procedure⁹.

According to our study the overall time taken for laparoscopic surgery was found to be more than for open surgery. In this study, the laparoscopic procedure was found to be associated with a longer operating time than open procedure (Mean of 97.5 minutes for laparoscopic against 70 minutes for open method). The more time required in LC was due to difficult adhesions and delivery of gall bladder through the port site. This is comparable with that of studies of Trondsen¹⁷ and Porte²⁹. As experience is gained, the operating time is decreased. This "learning curve" represents adapting to operating in the 2-D screen, becoming familiar with the instrumentation and becoming accustomed to the technique. The surgeon gets trained in dealing with challenging cases in the course of learning curve.

Patients who underwent open cholecystectomy need antibiotics coverage for at least 4 to 5 days more than the patients who undergo laparoscopic cholecystectomy according to Supe AN et al⁴.

Antibiotic requirement was found to be less in laparoscopic surgery according to Foster D.S et al and Phillips E et al^{10,11}. In the author's study all patients who underwent surgery were given antibiotics for 5 days whereas all patients

who had wound infection required antibiotic for more than 5 days.

All patients in our study were assessed for dosage of analgesics for 5 days and requirement for analgesics was assessed according to self-assessment pain score of patients. In the open surgery analgesic requirement was more. Two patients even required analgesics for up to 15 days. Need for analgesic was more in open than in laparoscopic surgery according to Waldner H et al and Supe AN et al^{4,9}.

In Carbajo Caballero et al's study the rate of complications was more in the open procedure than in laparoscopic cholecystectomy⁵. Complication rate is higher in open than in laparoscopic surgery^{4,6}. In our study 25% of patients who underwent open cholecystectomy had excessive bleeding, 5% had wound infection. In laparoscopic surgery the rate of complications was found to be 5% for bleeding, 2.5% for wound infection and 0% for common bile duct injury.

The conversion from laparoscopic procedure to open procedure was necessary in 2 patients out of 40. Both patients required conversion due to difficult dissection in view of thick adhesions and due to excessive fat in Calot's triangle. Conversion rate was 5%. Conversion rate was also found to be higher in acute cases in other studies (0-45%)^{31,32,34}. The mean duration of postoperative in-hospital stay was 7.3 days in laparoscopic surgery and 11.625 days in open cholecystectomy⁷. Patients who underwent open cholecystectomy had longer in-hospital stay than those who underwent laparoscopic cholecystectomy. According to Verma G et al^{6,9}; 96% of patients in study had an in-hospital stay of less than 5 days but all patients who underwent open surgery were hospitalized postoperatively for more than 5 days.

In the studies conducted by Carbajo et al, Supe AN et al and Verma GR et al patients who underwent laparoscopic cholecystectomy could get back to their routine work faster^{4,6,7}. The mean time taken for laparoscopic patients to resume routine activity was 12.8 days and 34.8 days in open surgery as seen in Steven HP et al's study⁸.

In our study only 2 patients who had laparoscopic surgery took more than 7 days to resume routine work whereas all patients who underwent open surgery took up to 14 days and more to resume routine work. The Open cholecystectomy group had larger wounds, which healed by primary intention with a single big scar. The Laparoscopic cholecystectomy group had port incisions of <1.5 cm, which healed by primary intention without much visible scar. Thus the cosmesis is the greatest advantage after lap cholecystectomy compared to open cholecystectomy.

The results support the view that laparoscopic cholecystectomy is a safe and justified replacement for open cholecystectomy. There is a definite learning curve for surgeons who are newly exposed. The complication rates were reduced as the surgeons become more experienced in this procedure to a level comparable with that of open cholecystectomy. Though there were a few conversions to open cholecystectomy, this reflects the good judgement keeping in view the safety of the patient as the priority. Laparoscopic cholecystectomy was safe with faster patient recovery and satisfaction earlier full mobilization and discharge, as well as early return to work.

In conclusion, the study supports the view that laparoscopic cholecystectomy is safer and efficacious and offers de-

finite advantages over open cholecystectomy and should be an available option for all patients requiring elective cholecystectomy.

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