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A Comparative Study of Laparoscopic Versus Open Cholecystectomy in Patients Having Cholelithiasis (Gall Stones)

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Abstract

Background: Cholelithiasis is a common cause of morbidity among Indians with female predominance and its treatment has shown a decisive shift from open to minimally invasive surgery, prevalence rate ranging from 10 to 20%[1] most of them are asymptomatic for a long time. With advent of laparoscopic cholecystectomy (LC) apart from shift from open cholecystectomy (OC) to laparoscopic cholecystectomy (LC) is benefit of decreased hospital stay, lesser postoperative pain and early return to normal activity. LC is cosmetically better when compared to OC. But some difficulty of LC in early phase of surgical practice is long operative time and increased incidence of biliary leakage.

Methods: A prospective study of 50 cases of gall stone carried out in district hospital Kalaburgi which was attached to ESIC Medical College Kalaburgi, between October 2017 and November 2018 with aim of comparing open cholecystectomy and laparoscopic cholecystectomy. Patients are divided randomly into two groups: group A underwent laparoscopic cholecystectomy and group B underwent open cholecystectomy. Pros and cons of both procedures is explained in detail to the patient.

Result: Duration of surgery is longer in OC than LC, 75.10 minutes versus 45.15 minutes, mean duration of postoperative pain 18 hours in group A and 30 hours in group B patients, the mean period of hospital stay was 1.8 days in group A and 4.5 days in group B patients, and postoperative food resumed in 1.2 days in group A and 2.5 days in group B and surgical site infection is higher in group B than group A.

Conclusion: Minimal invasive surgery laparoscopic cholecystectomy (LC) is better than open cholecystectomy (OC) as first choice interms of less postoperative pain, less hospital stay and fewer incidence of surgical site infection and early return to work.

Keywords: Cholelithiasis; LC (laparoscopic cholecystectomy); OC (open cholecystectomy); Minimal invasive surgery.

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Introduction

Gallstones are occurrence in north India, but the trend is now showing pan India, presence probably because of migration and blending of culture and life style. The prevalence ranging from 10 to 20%.[1]

Open cholecystectomy has been gold standard surgical treatment of cholelithiasis, with advent of laparoscopic cholecystectomy the scenario of surgical management of cholelithiasis has changed drastically. It has opened new horizons in the management of gallstones.

OC is the mainstay treatment for cholelithiasis and was first performed in 1882 by German surgeon Carl August Langenbuch.[2,3]

Various alternative methods like oral dissolution agents and lithotripsy exists but lack of desired impact in treatment of gallstone and rarely used in clinical practice.[4,5]

But with advent of LC there has been gradual shift in treatment and most of the surgeons are preferring LC over OC. The first LC was performed by Philleppe mouret in Lyon, France and now the most common laparoscopic surgery performed world wide.[6-8]

LC is associated with many advantages for the patient, provides early postoperative pain relief, decreased hospital stay, early return to normal activity, reduced cost, and cosmetic advantage.[9]

Though the benefit of LC is significantly more it has got its drawback, increased bileduct injury and initially longer duration of operation.[10]

As focus is three-dimensional depth perception is limited and some times it is difficult to visualise internal structure properly.[11] OC is preferred over LC in cardiac patients as CO_2 insufflation can lead to cardiac arrhythmias.[12]

Aims and Objectives

To study safety and efficacy of LC in patient of cholelithiasis by comparing results of OC, by comparing use of postoperative analgesics, operative time, postoperative hospital stay, morbidity and mortality.

Materials and Methods

A prospective study of 50 cases of gall stones carried out in district hospital Gulbarga which was attached to ESIC Medical College Gulbarga between October 2017 and November 2018 by comparing with result of OC versus LC, by comparing use of postoperative analgesia, operative time, postoperative hospital stay, morbidity and mortality.

Patients divided randomly into two groups: group A underwent LC and group B underwent OC. Pros and cons of both procedure is explained in detail to the patient. The study include all symptomatic with cholelithiasis who were admitted in surgery ward, complete history taken from the patient and properly physical examination done for diagnosis of gall stones, the following investigations done before operation, complete blood count, blood sugar level, liver function test, routine urine examination, serum electrolytes, kidney function test, HbsAg and HIV, chest X-ray ECG, abdominal ultrasound. First dose of antibiotic is administered 2 hours before surgery and nasogastric tube inserted, Foley catheter inserted in all group of patients.

Postoperative management includes nill by mouth till bowel sound is heard, IV Fluids administrated, broad spectrum antibiotics given (cefotaxim). In case of bile leak injection amikacin and injection metronidazole given, analgesics like tremadol and topup injection diclofenac sodium given when ever required. Patient is discharged after oral diet starts. Any sign of postoperative infection is present, then dressing done and pus sent for culture and sensitivity, appropriate antibiotics started after reports. Care to be taken accordingly followup in OPD in 7–10 days.

Inclusion criteria: patients with cholelithiasis proved by USG and symptomatology consistent with cholelithiasis fit for elective cholecystectomy will be included in the study.

Exclusion criteria: Patients with the following conditions will be excluded.

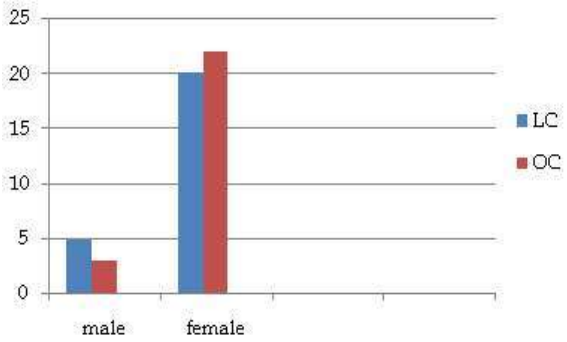
1. History or investigations suggestive of CBD stones.
2. History of previous abdominal surgeries.
3. Patient above the age of 75.

Results

Most of the patients in study were female (80%) there were 42 females and 8 males in randomly both groups the age ranging from 25 years to 74 years. Majority of patients belong to the age group of 40-60. Pain in right hypochondrium was the most common complaint followed by fullness after food associated with nausea, vomiting, dyspepsia, belching and fever. These are commonly present in each group.

Table 1: Sex distribution

Sex	LC (group A)	OC (group B)
Male	5	3
Female	20	22



Graph 1: Sex distribution

Table 2: Age distribution

Age group	LC (group A)	OC (group B)
21–40	9	8
41–60	8	7
61–80	8	10
Total	25	25

Table 3: Operative time

Operative time	LC (group A)	OC (group B)
41–50	-	-
51–60	2	1
61–70	17	4
71–80	6	20

Time taken completion of surgery was significantly higher in OC than LC, duration of surgery for OC was 71-80 minutes (mean is 75.5 minutes) while in LC 61-70 minutes (mean is 65.5 minutes) (Table 3 and Graph 2). The patient who has undergone LC has Pain relief earlier than those who underwent OC. It was observed mean duration of postoperative pain 18.3 hours in LC (group A) as compared to mean duration of postoperative pain 30.7 hours in OC (group B) (Table 4).

Table 4:

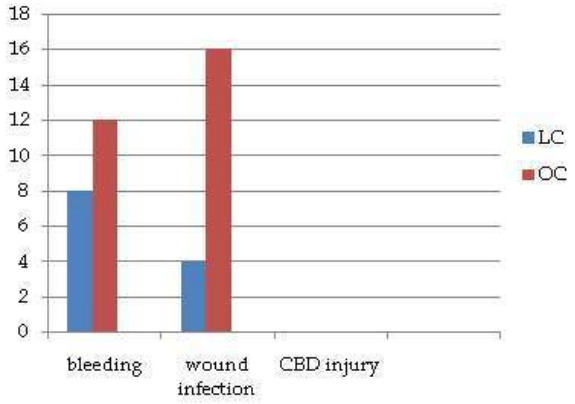
Laparoscopic cholecystectomy				Open cholecystectomy			
< 1 1/2	%	>1 1/2	%	< 1 1/2	%	>1 1/2	%
22	88	3	12	17	68	8	32

Twnety eight percent of patients who underwent OC had complication and 16% of patients who underwent LC had complications, the overall percentage of complications is less in laparoscopic surgery than open surgery (Table 5).

Table 5: Complications

Complications	LC	%	OC	%
Bleeding	2	8%	3	12%
Wound infection	1	4%	4	16%
CBD injury	0	0	0	0
Total		12%		28%

P value = <0.05



Graph 2: Operative time

Twenty three patients who underwent LC had analgesics only for 5 days and all the patients who underwent OC had analgesics for more than 5 days (Table 6).

Table 6: No of days of analgesics.

Surgery	<5 days	%	>5 days	%
LC	23	92	2	8
OC	0	0	25	100

p value: < 0.001

Discussion

As Supe AN *et al.*[13] the time taken for laparoscopic surgery is more than open surgery.

According to Walder H *et al.*[14] there is no significant difference between LC and OC. According to author's study laparoscopic surgery time taken is less than open cholecystectomy. 8% of patients according to author in study who underwent LC only had minimal bleeding (< 50 ml), whereas 12% of patients who underwent OC had about 100–150 ml of bleeding.

Patients who underwent OC require more than 4-5 days of antibiotics than those who undergo LC according to Supe *et al.*[13] Antibiotics requirement is found to be less in LC according to Foster DS *et al.* and Phillips E *et al.*[15,16]

In author's study 92% of patients who underwent LC required antibiotic maximum for 5 days and OC all the patients required antibiotics for more than 5 days.

23 of LC patient in author's study require analgesics for less than 5 days and in OC analgesic requirement is at least 7–10 days.

Need of analgesic is more in OC than in LC. Waldner H *et al.* and Supe AN *et al.*[13,14]

In Carbajo Caballero *et al.*'s study the rate of complication was more in OC than in LC.[17]

Complication rate is higher in open than in LC.[13,18]

In author's study 12% of patients who underwent OC had excessive bleeding, 16% had wound infection.

In LC the rate of complication was found to be 8% for bleeding which was minimal, 4% for wound infection.

Patients who underwent OC had longer hospital stay than those who underwent LC. According to Verma GR *et al.*[18] 96% in author's study had a hospital stay of less than 5 days but all patients who underwent OC were hospitalised for more

than 5 days.

In study conducted by Carbajo *et al*.[17] Supe AN et al.[13] and Verma GR *et al*.[18] patient who underwent LC could get back to their routine faster. The mean time taken for the patient to resume to routine work is 12.8 days and 34.8 days in OC as seen in Steven HP *et al*.'s study.[19]

In our author's study only 3 patients took more than 1 week to resume routine work. All patients who underwent OC took more than 2 weeks and more to resume routine work. By and large LC cost involved is more than the open surgery.

Conclusion

LC is a considerable advancement in the treatment of gall bladder disease. The following are the advantages of LC:

1. Technically the cleavage and dissection of cystic artery and cystic duct is very precise and bleeding can be controlled easily without much blood loss.
2. LC is associated with less chances of wound infection and no chance of wound dehiscence.
3. The pain is less and duration also less.
4. Duration of hospital stay is less.
5. Has a cosmetic advantage apparently.

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Conflict of interest: None declared.

Ethical approval: The study was approved by institutional ethical committee.

References

1. Doke A., Gadekar N., Gadekar J., Dash N., Unwane S.A., Comparative study between open vs laparoscopic cholecystectomy. Sch. J. APP Med Science. 2016;4(1):57–61.
2. Traverso LW (1976) Carl Langenbuch and first cholecystectomy (internet). Am Journal of Surgery 81–82.
3. Gadaez TR, Talamini MA. Traditional versus laparoscopic cholecystectomy. Am J. Surg. 1999;161.336–8.
4. Villanova N., Bazzoli F., Tarouni F, Frabboni R., Mazella G., Festi D., *et al*. Gallstone recurrence after successful oral bile acid treatment A 12-year follow up study and evaluation of long-term post- dissolution treatment Gastro Enterol. 1989;97:726–31.
5. Della Bianca P., Bonvin B., Lithotripsy of biliary calculi by shockwaves current possibilities and prospective Helv Chir Acta. 1990; 56:913–6.
6. Mcsherry CK open cholecystectomy. Am J Surg. 1993;165:435–9.
7. Jiw Li., LT, Li JS role of laparoscopic subtotal cholecystectomy in treatment of complicated cholecystitis. Hepatobili pancreat DIS Int. 2006;5(4): 584–9.
8. Cushier A. Laparoscopic cholecystectomy JR Coll Surg: Edinb. 1999;44:187–92.
9. Starasberg SM. Clinical practice acute calculus cholecystitis. New England Journal. 2011;358(26): 2804.
10. Paulino-netto A. A view of 391 selected opened cholecystectomies for comparison with laparoscopic cholecystectomy. Am J Surg. 1993;166:71–3.
11. Lurd Burg O Kristofferson A, open versus laparoscopic cholecystectomy for gall bladder carcinoma. J Hepatobiliary Pancreat Surg. 2001;8(6): 525–9.
12. Pessaux P., Regent N., Tuech JJ., Rouge L Bergamasschi R., Amand JP Laparoscopic versus open cholecystectomy, a prospective comparative study in the elderly with acute cholecystitis. Surg. Laprosc Endosc Percutaneous Tech. 2001;11:252–5.
13. Supe AN, Bapal VN, Pnadya SV, Dlavi AN , Bepat RD. Laparoscopic versus open cholecystectomy. Indian. J: Gastroenterology. 1996;15(3):94–6.
14. Waldner H., Laparoscopic versus open cholecystectomy in acute cholecystitis. Langen Becker Arch Chir Suppl Kongress bd. 1997;144:1177–9.
15. Prospective comparison of laparoscopic cholecystectomy in community hospital. Foster DS WV Med J. 1995;91(6):270–272.
16. Phillips E., Carroll B. Laparoscopic cholecystectomy in acute cholecystitis. Am Surg. 1992;58:273–276.
17. Carbajo CM, Martin DOJ, Blanco AJ, Cuesta DLLC, Atienza SR, Inglada GL, Va Quero PC, Surgical treatment of acute cholecystitis in laparoscopic age a comaparative study laparoscopic against laparotomy Rev. ESP. Enfem Dig. 1998;90(11): 788–93.
18. Verma GR, Laproscopic versus open cholecystectomy. Indian J. Gastroentrology. 1997.
19. Steven HP, Van De Berg M, Ruseler CH, Wereldsing JC, clinical and financial aspect of cholecystectomy. Laparoscopic versus open technic world. J. Surg. 1997;21(1):91-6 discussion 96–7.