

# A Comparative Study of Laparoscopic vs. Open Cholecystectomy in a Suburban Teaching Hospital

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## Abstract

**Background:** Gallstones are common in Indian population and its treatment has shown a decisive shift from open to minimally invasive route. There is no doubt that laparoscopy require longer and steeper learning curve and incur higher cost, especially in the absence of health insurance to majority of suburban and rural Indian population. However, preferences of patients are changing rapidly due to better level of awareness and availability of healthcare facility. The guidelines issued by Medical Council of India on laparoscopic training for postgraduate surgical residents has shown favorable results for patients, junior faculties and residents.

**Aims:** To study safety and efficacy of laparoscopic cholecystectomy in patients of cholelithiasis by comparing with results of open cholecystectomy by comparing use of Post-operative analgesia, Operative Time, Post-operative hospital stay, morbidity and mortality.

**Material and Method:** It is a prospective randomized study of 100 Patients of cholelithiasis aged between 25 years to 65 years operated during 2011-2012 at a suburban teaching hospital. They were divided into open and laparoscopic cholecystectomy group by draw a lot method. 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. This study was done after due clearance of Ethical committee.

**Results:** The median (range) operation time for laparoscopic cholecystectomy was 50-175 min (mean=103.98 min) and 35-95 min (mean=70 min) for open cholecystectomy ( $p < 0.001$ ). 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 (Mean no. of days=1.5) is considerably less than open cholecystectomy (Mean no. of days=3.36). Conversion rate in literature in laparoscopic cholecystectomy ranges from 3% to 15% in well trained

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(Chenodexychoic acid and Ursodexychoic acid) and Extracorporeal Shock Wave Lithotripsy (ESWL) have not shown promising results [6-8].

To study safety and efficacy of laparoscopic cholecystectomy in patients of cholelithiasis by comparing with results of open cholecystectomy by comparing use of Post-operative analgesia, Operative Time, Post-operative hospital stay, morbidity and mortality.

Our study is a prospective randomized study included 100 patients with gall stones which were admitted to a suburban teaching hospital of India. Randomization was done by draw of lots. The selection of procedure of open cholecystectomy or laparoscopic cholecystectomy.

Nature of operation	Range of pain duration in days	Pain duration in days (mean)	Standard deviation
Laparoscopic cholecystectomy	1-4 days	1.5 days	1.4743
Open cholecystectomy	2-8 days	3.36 days	2.048

**Table 2** Pain duration for both open and laparoscopic cholecystectomy groups are as follows.

The mean post-operative hospital stay was 3.7 days after laparoscopic cholecystectomy and 5.46 days after open cholecystectomy. The independent samples 't' test applied to number of days (duration) of post-operative hospital stay required to type of surgery. {The sample size (n) is equal i.e. 50 Independent sample t test: t statistics -3.3142 degree of freedom 98 critical value 2.6259 99% confidence interval (-1.3581 4.8781)} Result shows rejection of null hypothesis. Therefore, Open cholecystectomy group had significantly less hospital stay than laparoscopic cholecystectomy group (t

(98)=-3.3142, p<0.001) and had the mean difference lies between -1.3581 and 4.8781.

Conversion of laparoscopic to open cholecystectomy occurred in three (3) of the fifty (50) patients i.e. 6% of initially scheduled to undergo laparoscopic cholecystectomy. Two cases of laparoscopic cholecystectomy were converted to open surgery due to common bile duct injury and one due to intra operative hemorrhage.

Complications	Open cholecystectomy	Laparoscopic cholecystectomy
Wound infection	9	3 (Difficult laparoscopic cholecystectomy cases).
Intra operative bleeding	0	1
Wound dehiscence	1	0
Abdominal infection	2	0
Bile duct injury	0	2
Pancreatitis	0	0
Postoperative ileus	5	3
Pulmonary problems	1	2
Cardiac problems	0	0
Death	0	0

**Table 3** Complications of open and laparoscopic surgery.

Various series.	Mean operative time open cholecystectomy (min)/ Postop hospital stay(Days)	Mean operative time laparoscopic cholecystectomy (min)/Postop hospital stay (Days)
CH Chau et al.	84.8 minutes/10.1 days	92.2 minutes/7.1 days
Lujan et al.	77 minutes/8.1 days	

laparoscope. The extent to which the surgical incision contributes to morbidity and mortality is well established. Sufficient time has elapsed since the first laparoscopic cholecystectomy was performed. Indeed explosive growth of minimally invasive surgery of which laparoscopic cholecystectomy is prototype mandates the need for comparisons with respect to morbidity and mortality. Most surgeons have passed through the learning curve phase of their experience and have now settled into established patterns of activity [11,12]. There has been a lot of debate whether to operate asymptomatic gallstones or not. A century ago, in 1904, Mayo wrote 'there is no innocent gallstone', but today we know there are plenty of evidences to support that not only there are asymptomatic gallstones but most of these incidentally found stones remain asymptomatic throughout life, and do not require treatment. 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 at least one episode of biliary pain. 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. 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 [13-16]. Has laparoscopic cholecystectomy changed the view of the surgeons or physicians and the patients towards asymptomatic gallstones? Unfortunately, the answer is 'Yes'. After the introduction and widespread use of laparoscopic cholecystectomy, a significant change has been observed possibly due to the attitude of surgeons to relax the indication of surgery, including for asymptomatic gallstone, resulting in an increase (of up to 60%) in cholecystectomies worldwide. Laparoscopic cholecystectomy in young patients with uncomplicated, asymptomatic gallstones is safe with greater patient acceptance, and this approach in early age eliminates the need for problematic surgery at a later date when the patient is older, with associated diseases or with complications [17,18].

The indications of surgery for asymptomatic gallstones are presence of

studies whereas it is 3 or less in cases of laparoscopic cholecystectomy patients [28-30].

Worldwide many case series have been published regarding comparison between laparoscopic cholecystectomy and open cholecystectomy and results are in favor of laparoscopic cholecystectomy. However, open cholecystectomy is preferred method for Surgeons in the beginning of the laparoscopic cholecystectomy.