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Research Article

AN ANALYSIS OF CONVERSION FROM LAPAROSCOPIC TO OPEN CHOLECYSTECTOMY

Dr. Bijit Gogoi,

Associate Prof. of Surgery, Jorhat Medical College and Hospital

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ABSTRACT

Background: Gallstones are a common disease affecting mankind since time immemorial and surgical removal of the gallbladder by laparoscopic method has become the common procedure and the gold standard. Our study is to have an insight into the reasons for conversion of laparoscopic cholecystectomy to open cholecystectomy.
Materials and methods: A series of 236 cholelithiasis patients who underwent laparoscopic cholecystectomy and those converted to open cholecystectomy were evaluated.
Results: 236 consecutive patients of cholelithiasis were studied. Age of the patients ranged from 14 years to 72 years. The mean age of the patients was 36.31 ± 12.95. The common reasons for conversion were dense adhesions in the calot's triangle and bleeding.
Conclusion: The conversion rate was 2.5% in our study. There should be a low threshold for conversion from laparoscopic to open cholecystectomy in difficult situations.

INTRODUCTION

The oldest presence of gall stones were that found in the mummy of an Egyptian priestess around 1500 BC[1]. By the seventh decade 20% males and 35% females usually develop stones in the gall bladder and the most effective way to remove the pain and the suffering is the surgical removal of the gall bladder as then the chances of recurrent pain and complications like gallstone pancreatitis will no longer be there. Philippe Mouret did the first laparoscopic cholecystectomy in 1987 in France[2]. Though there were some initial hiccups in doing a safe laparoscopic cholecystectomy with the new instruments, it soon became the gold standard for surgical removal of the gall bladder in the rest of the world in a very short time. And the reasons were a faster recovery time for the patient, minimal pain, shorter hospital stay and minimal scar.

MATERIALS AND METHODS

A series of 236 consecutive patients of cholelithiasis admitted and treated at Jorhat Medical College during the period from December 2018 to November 2019, were evaluated. All the patients had gallstones on ultrasound and all the patients underwent laparoscopic cholecystectomy. All the operations were done with the routine four ports procedure. Patients having gallbladder polyps were not included in the study. Clinical profile of the patients were recorded which included age, sex, disease, post operative pain, associated medical illness, hypertension and diabetes mellitus. In the USG, the number of stones, presence of sludge, thickness of the gallbladder wall, shrunken / distended gallbladder, any pus content in the GB (empyema), were noted. Patients were taken up for surgery after the necessary pre anaesthetic checkup. Laparoscopic cholecystectomy was done in all the patients except those where difficulty was encountered peroperative and were subsequently converted to open cholecystectomy. The patients received preoperative and post operative antibiotics, IV fluids and proton pump inhibitors. Patients outcome was recorded at discharge and at three weeks followup. Suspicious specimen were sent for histopathological examination. All records were scrutinised and the clinical findings, radiological findings and the management were analysed with the outcome. SPSS Statistics was used to analyse the data. Also t- test, Chi- square test and Fischer's exact test were used to find the p value, and p value <0.05 is considered to be significant under 95% confidence interval.

RESULTS

The study consisted of 236 consecutive patients of cholelithiasis. Age of the patients ranged from 14 years to 72 years. The mean age of the patients was 36.31 ± 12.95. The mean age in the LC group was 36.16 ± 13.02 and the mean age in the converted group was 31.2 ± 17.69.

Corresponding author:* **Dr. Bijit Gogoi,
Associate Prof. of Surgery, Jorhat Medical College and Hospital

Table 1 Age distribution

Age group	Patients	%
14-23	39	16.5%
24-33	72	30.5%
34-43	69	29.1%
44-53	31	13.1%
54-63	16	6.7%
64-73	9	4.1%
Total	236	100%

The maximum incidence was seen in patients between 24-33 years of age. There were 52 males (22%) and 184 females (78%).

Table 2 Sex Distribution

Sex	Person	%
Male	52	22%
Female	184	78%
Total	236	100%

There were 6 conversions, of which there were 4 females (67%) and 2 males (33.3%) and p value is 0.457 which is not significant. The conversion rate was 2.5% in our study. The female male ratio was 2:1. Out of 52 males, 2 were converted(3.9%) and out of 184 females 4 were converted(2.2%) and this indicates a higher rate of conversion in males and and p value is 0.205 which is not significant. In the converted group, 5 patients were in the age range of 40-51 years. Of the 236 patients, 115(49%) patients had pain in the epigastrium and 121(51%) had pain in the right hypochondrium. Of the 6 converted patients, 4 had epigastric pain (67%) and 2 had pain in the right hypochondrium (33.3%). In comorbidities, 71(30%) patients were hypertensive and were on antihypertensive medications and 17 (7%)patients were diabetics on oral hypoglycaemics or insulin. Of the 71 patients who were hypertensive 2(3%) were converted and among the 165 non hypertensives, 4(2.4%) were converted and p value is 1.000 which is not significant and so hypertension is not a significant predictor of conversion. Among the 17 diabetics, none were converted, and among the non diabetics, 6(3%) were converted and p value is 1.000 which is not significant. In USG findings, 43(18%) patients had single calculus, 193 (82%) had multiple calculi, 23(10%) had adhesions over the gallbladder, 53 (23%) had GB wall thickening (>4mm) and 6(2.5%) had pericholecystic fluid. Of the 43 patients who had single calculus, 1(2.3%) had conversion, of the 193 patients with multiple calculi, 5(3%) had conversion, of the 6 patients with pericholecystic fluid 2(33%) had conversion, and of the 23 patients with GB adhesions 2(9%) were converted . Of the 53 patients with GB wall thickening, 6(11%) had conversion and of the 183 patients with normal GB wall, none were converted and p value is 0.0001 which is statistically very significant. In pre operative diagnosis, there were 230 cholelithiasis patients and 6 acute patients who were diagnosed by preoperative USG with inflammed and oedematous GB wall and pericholecystic fluid. Of the 230 cholelithiasis patients, 2(1%) were converted and 228(99%) not converted and of the 6 acute cholecystitis patients, 2(33%) were converted and 4(67%) not converted and p value is 0.0032 which is statistically significant. There was no history of previous upper abdominal surgery in the operated patients and in the converted group. The reason for conversion from LC to open cholecystectomy in our series were 1. *Bleeding* (33%) (a) from the cystic artery in one patient which was tightly hugging the short cystic duct. (b) bleeding from the liver bed in another patient and the site was just adjacent to the CHD. 2. *Obscure anatomy* (67%). (A) Mirrizi syndrome in one patient. In Mirrizi syndrome, surgery is difficult as the calot's triangle is usually obliterated and there is a high risk of injury to the CBD. (B) Dense adhesions in the calot's triangle in the rest three patients obscuring the anatomy. In post operative pain, mild pain was seen in 70(30%) patients who had lap. cholecystectomy and moderate pain in 5(2%) and severe pain in none. In the converted group, mild pain was seen in 4(67%), moderate pain in 2 (33%) and severe pain in none. In post operative complications, in LC patients , wound infection was seen in 1(0.4%) and is usually due to broken bits of calculi accidentally left behind in the port cavity during extraction, pleural effusion was seen in 1(0.4%), localised abdominal guard was seen in 2(0.9%) and minimal bile collection in Morrison's pouch was seen in 1(0.4%) probably due to partial slippage of the cystic duct clip as seen on USG and MRI abdomen and who recovered conservatively. In the converted group, no wound infection was seen in any patient but mild respiratory difficulty was seen in 1(17%) and she recovered later on nebulisation and was probably due to the cold blood transfusion which she had received peroperative. In post operative stay in hospital, in the LC group, 210 patients were discharged by 3rd day, 19 patients by 4-5 days, and 1 stayed beyond 6 days. In the converted group, all the patients were discharged by 6th day. The average post op. stay in LC cases was maximum of 91% stayed upto 3 days in LC group and in converted cases, all the patients stayed for 6 days and their p value is <0.0001 which is highly significant. No malignancy was reported in any specimen sent for histopathological examination. All the patients were well on followup. There was no mortality in our series.Thus it can be inferred from the results that patients whose age is >40 years, patients operated during acute cholecystitis and USG findings showing gallbladder wall thickness> 4mm, inflammed GB wall and presence of pericholecystic fluid are more likely to be converted to open cholecystectomy than otherwise. This leads to an increase in the operative time and a longer hospital stay due to the increased morbidity.

DISCUSSION

Laparoscopic cholecystectomy has now become the gold standard in the treatment of gallstones. However conversion to open cholecystectomy is still necessary in some patients and this ranges from 2-15% [3,4,5]. Laparoscopic cholecystectomy in acute cholecystitis, must be done by an expert surgeon with a dedicated team with a low threshold for conversion in case of difficulty as the gallbladder is highly swollen and oedematous and there is a lot of sanguineous ooze both from the gallbladder and the liver bed and this leads to a higher chance of conversion, so as to avoid injury to the CBD, as the patients wellbeing is foremost in the surgeons mind.[6,7] Gallstones can involve any age group but the incidence is more from the 3rd to 5th decades of life. In our series the minimum age was 14 years and the maximum age was 72 years and the incidence was more in the age range of 24-33 years. The mean age in our series was 36.31 ± 12.95. Daradkeh[8] showed a mean age of 47.2 years while Bingener *et al*[9] showed a mean age of 40 years. 236 patients had laparoscopic cholecystectomy and 6(2.5%) were converted to open cholecystectomy. In the converted group , most of the patients (5/6)83% were in the age range of 40-51 years. Volkan Genc *et al*[10] had a mean age at conversion of 52.5 years, Bingener *et al*[9] at 42 years and in our series the mean age at conversion was 31.2 ± 17.69. Our

series had 184(78%) females of gall stone disease compared to 52(22%) males and this showed a higher incidence in females compared to males and similar was the scenario by Bingener *et al*[9] who showed 76% females to 24% males and by Sakpal *et al*[11] who showed 74.7% females to 25.3% males. The high incidence in females of gallstone disease can be because pregnancy and childbirth with weight gain causes bile stasis leading to increased cholesterol in the blood. Sakpal *et al*[11] showed conversion rates at 9.1% in males and 3.5% in females while Volken Genc *et al*[10] showed conversion at 5.65% in males and 2.25% in females and similarly our study showed conversion rates at 3.9% in males and 2.2% in females and p value is 0.205 which is not significant. Though the cause of higher rates of conversion in male patients is unclear, it is seen that male patients have more severe inflammation and fibrosis making dissection in the calot's triangle extremely difficult. In comorbidities, Al –Mulhim AR[12] did not find any significant difference between the laparoscopic and the converted groups in his study of 18% diabetics and non diabetics. Volkan Genc *et al*[10] in his study of 5164 LC patients found that even though the comorbid diseases in the converted group was higher than the laparoscopic group, no statistically significant difference was found. Similar findings were reported by B A Abdulhussein *et al*[13]. Similarly in our series, no diabetic patient underwent conversion and p value is 1.000 which is not significant. In hypertensive patients, Raffaele Costantini *et al*[14] in his series of 906 LC patients did not find any statistical significance. In our series, out of 71 patients who were hypertensive, 2(3%) underwent conversion and p value is 1.000 which is not significant. On USG, our series showed GB wall thickening (>4mm) in 53(23%) patients and 6 (11%) patients underwent conversion and p value is 0.0001 which is statistically very significant. Similarly Liu *et al*[16] had a 13.07% conversion rate and Ercan *et al*[17] had a 14.35 % conversion rate with GB wall thickness >4mm. Our series showed pericholecystic fluid in 6(2.5%) patients and 2(33%) underwent conversion and a study by Grzegorz Cwik *et al*[15] also reported that pericholecystic exudates and GB wall thickening >5mm had increased conversion rates. In our series, of the 6 patients who had acute cholecystitis and underwent LC, 2 (33%) were converted and p value is 0.0032 which is statistically significant. Similarly Teixeira *et al* had[18] a conversion rate of 24%, while Rutledge *et al* had a conversion[19] rate of 26%.This shows that there is an increased rate of conversion in patients having acute cholecystitis.

In our series of post op. stay in hospital, for LC patients, 210 patients were discharged by 3rd day, 19 patients by 4-5 days, and 1 patient stayed beyond 6 days. In the converted group all the patients were discharged by 6th day. The average post op. stay in LC cases was maximum of 91% stayed upto 3 days in LC group and in converted cases all the patients stayed for 6 days and their p value is <0.0001 which is highly significant.The post op. stay for LC patients was 2.7 days for Haytham K *et al*[20], 1.89 days for S Ibrahim *et al*[21], 2.5 days for S.S.Sikora[22] and 1.3 days for Ercan[17] *et al* which is similar to our series. In post op. hospital stay for converted patients it was 5.4 days for Haytham K *et al*[20], 7.53 days for S Ibrahim *et al*[21], 4.2 days for S.S.Sikora *et al*[22] and 4.8 days for Ercan *et al*[17] and quite similar to our series. Thus it is seen that converted patients had a longer post op. stay in hospital than the LC group. The conversion rate was 2.5% in our study and similar is the conversion rate of B J Abdulhussein *et al* at 3.5%[13], Grzegorz Cwik *et al*[15] at 3.8%, R Costantini *et al*[14] at 2.76% and S Duca *et al*[23] at 1.9%. The reasons for conversion in our series were obscure anatomy (67%)due to dense adhesions in the calot's triangle and Mirrizi syndrome and and similar findings were reported by Bingener *et al*[9] with obscure anatomy(50%), S.S.Sikora *et al*[22] –Obscure anatomy/adhesions(62.1%), Y Ishizaki *et al*-Adhesions[24](62%). Second frequent cause for conversion in our series was bleeding(33%) from the cystic artery and from the liver bed and similar finding was reported by D collet *et al*[25](19%), S Ibrahim *et al*[21](27.2%). In post operative pain and complications, patients in our series who had conversion had more pain compared to the LC group due to the longer incision and injured nerves. Complications were more in the converted group like wound and pulmonary infection. Similar findings were reported by Haytham Kaafarani[20] for wound infections and by S Ibrahim[21]. The reason is that a large incision increases the pain which restricts the respiration, leading to lung infection and atelectasis, and a larger incision may also cause haematoma and fat necrosis with resultant wound infection.

CONCLUSION

236 cholelithiasis patients were studied. The mean age of the patients was 36.31 ± 12.95. The mean age in the LC group was 36.16 ± 13.02 and the mean age in the converted group was 31.2 ± 17.69. The conversion rate was 2.5% in our study. In case of difficulty, there should be a low threshold for conversion from laparoscopic to open cholecystectomy, which has to be done for the wellbeing of the patient, which is the primary concern of the surgeon. Patients aged >40 years, and USG showing gallbladder wall thickness > 4mm, inflammed GB wall, and dense adhesions at the calot's triangle are more likely to be converted to open cholecystectomy than otherwise, with an increase in the operative time and a longer hospital stay.

References

1. Art of laparoscopic surgery, vol 1, C. Palanivelu
2. Mastery of Surgery, 5th edition, Fischer, Kirby, 2007, pub: Wolters Kluwer, Lippincott Williams & Wilkins.
3. Livingstone EH, Rege RV, A nationwide study of conversion from laparoscopic to open cholecystectomy.Am j Surg 2004;188:205-11. (PUBMED)(FULLTEXT).
4. Kama NA, Kologlu M, Dogonay M, Reis E, Atli M, Dolapei M. A risk score for conversion from laparoscopic to open cholecystectomy. Am J Surg 2001;181:520-5.
5. Rosen M, Brody F, Ponsky J. Predictive factors for conversion of laparoscopic cholecystectomy. Am J Surg 2002;184:254-8. (PUBMED) (FULLTEXT).
6. Lo CM, Fan ST, Liu CL, Lai CS, Wong J. Early decision for conversion of laparoscopic to open cholecystectomy for treatment of acute cholecystitis. Am J Surg 1997;173:513-7.
7. Kologlu M, Tutuncu T, Yuksek YN, Gozalan U, Daglar G, Kama NA. Using a risk score for conversion from laparoscopic to open cholecystectomy in resident training. Surgery 2004; 135: 282-7.(PUBMED) (FULLTEXT).

8. Daradkeh S. Laparoscopic cholecystectomy: Analytical study of 1208 cases. J Hepatogastroenterology, pg 1011-4.
9. Bingener- Casey J, Richards M, Strodel W, Schwesinger W, Sirinek K. Reasons for conversion from laparoscopic to open cholecystectomy: A 10 year review. J Gastroinst Surg. 2002; p. 800-805.
10. Genc V, Sulaimanov M, Cipe G, Basceken SI, Erverdi N, Gurel M, *et al*. What necessitates the conversion to open cholecystectomy? A retrospective analysis of 5164 consecutive laparoscopic operations. Clinics (Sau Paulo). 2011 March; 66(3); p. 417-420.
11. Sakpal S, Bindra S, Chamberlain R. Laparoscopic cholecystectomy conversion rates two decades later. JSLS. 2010 Oct-Dec, p. 476-483.
12. Al- Mulhim. The outcome of Laparoscopic cholecystectomy in diabetic patients: A prospective study. J Laparoendosc Adv Surg Tech. 2010 June; 20(5): p. 417-20.
13. Abdulhussein BJ, Hussein YF, Nawar AH, Al-Naggar RA. Conversion Rate of Laparoscopic Cholecystectomy to Open Surgery at Al Karamah Teaching Hospital, Iraq. Surgical Science. 2015 May; 6: p. 221-226.
14. Costantini R, Caldaralo F, Palmieri C. Risk factors for conversion of laparoscopic cholecystectomy. Ann Ital Chir. 2011 October.
15. Cwik G, Skoczylas T, Wyroslak-Najs J, Wallner G. The value of percutaneous ultrasound in predicting conversion from laparoscopic to open cholecystectomy due to acute cholecystitis. Surgical Endoscopy.2013 July; 27(7); p. 2561-2568.
16. Liu CL, Fan St, Lai E, Lo CM, Chu KM. Factors affecting conversion of Laparoscopic cholecystectomy to open surgery. Arch Surg. 1996; 131: p. 98-101.
17. Ercan M, Bostanci B, Teke Z, Karaman K, Dalgic T, Ulas M, *et al*. Predictive factors for conversion to open surgery in patients undergoing elective Laparoscopic Cholecystectomy. *Journal of Laparoendoscopic and advanced surgical techniques*. 2010;20(5).
18. Texeira J, Saraiva A, Cabral A, Barros H, Reis J,Texeira A. Conversion factors in laparoscopic cholecystectomy for acute cholecystitis. Hepatogastroenterology. 2000; 47; p. 626-630.
19. Rutledge D, Jones D, Rege R. Consequences of delay in surgical treatment of biliary disease. Am J Surg. 2000; 180: p. 466-469.
20. Kafaarani H, Smith TS, Neumayer L, Berger DH, Depalma RG, Itani K. Trends, outcomes and predictors of open and conversion to open cholecystectomy in Veterans Health Administration Hospitals. The American Journal of Surgery. 2010; 200: p. 32-40.
21. Ibrahim S, Hean TK, Ho LS, Ravintharan, Chye TN, Chee CH. Risk factors for conversion to open surgery in patients undergoing laparoscopic cholecystectomy. World Journal Surg. 2006 Sep; 30(9).
22. Sikora S, Kumar A, Saxena R, Kapoor V, Kaushik S. Laparoscopic Cholecystectomy, can conversion be predicted? World J. Surg. 1995;19: p. 858-860.
23. Duca S, Al-Hajjar N, Iancu C, Puia I, Munteanu D, Graur F. Laparoscopic cholecystectomy: incidents and complications. A retrospective analysis of 9542 consecutive laparoscopic operations. HPB(Oxford). 2003; 3(5): p. 152-158.
24. Ishizaki Y, Miwa K, Yoshimoto J, Sugo H, Kawasaki S. Conversion of elective laparoscopic to open cholecystectomy between 1993 and 2004. Br J Surg. 2006; (93): p. 987-91.
25. Collet D, Edye M, Perissat J. Conversions and complications of laparoscopic cholecystectomy. Surg Endosc. 1993; 7: p. 334-338.

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