



A STUDY OF SURGICAL TECHNIQUES IN DIFFICULT LAPAROSCOPIC CHOLECYSTECTOMIES

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ABSTRACT

AIMS: This study aims to evaluate the impact of conversion from retrograde dissection to fundus-first technique (FF) or laparoscopic partial cholecystectomy (LPC) on complication rates, operation time, and duration of hospitalization.

METHODS: The medical records of 210 consecutive patients who underwent laparoscopic cholecystectomy between January 2011 and December 2017 were retrospectively evaluated.

RESULTS: Of the 210 cases, LC was initiated and completed with RD in 197 cases. FF was implemented in 13 cases due to difficulties in dissection. In the FF group, laparoscopic total cholecystectomy was successfully accomplished in seven patients, and LPC was performed in the remaining six cases.

CONCLUSION: In complicated cases where anatomic uncertainties are dominant, the performance of FF technique or LPC may decrease conversion rates to open surgery and contribute to accomplishing the laparoscopic intervention safely.

KEYWORDS: laparoscopic cholecystectomy

INTRODUCTION:

Eric Muhe first introduced Laparoscopic cholecystectomy (LC) through a direct-view laparoscope without any camera monitor imaging system in 1985.[1] In the mid-1990s, Kato et al.[2] reported that the gallbladder could be successfully separated from the cystic bed via dissection of the Calot's triangle. Since then, the retrograde approach has become widely used by surgeons throughout the world, and LC became the standard treatment for gallstone disease and acute cholecystitis.

In the setting of difficult dissection of Calot's triangle during LC, the risk of severe complications and the rate of conversion to open surgery increases. Although conversion to open surgery is not considered as a failure, it is clear that it eliminates the advantages of laparoscopy and lengthens the time of recovery and does not always provide a better view of the anatomy.[3] In the era of minimally invasive surgeries, junior surgeons, in particular, do not have enough experience with the open approach. This may lead to more serious bile duct injuries, such as transection or resection of the common bile duct (CBD).[4] The fundus-first (FF) technique (dome down, antegrade dissection) and laparoscopic partial cholecystectomy (LPC) decreases the rate of major complications and conversion rate in cases with difficult dissection of the cystic duct and cystic artery.[5,6] This study aims to evaluate the effects of conversion from RD to FF or LPC on complication and conversion rates to open surgery in cases of difficult laparoscopic cholecystectomies.

MATERIALS AND METHODS:

This was a retrospective study carried out in the department of surgery in a tertiary hospital in maharashtra from January 2010 to December 2016 of medical records of 240 consecutive patients who underwent LC for cholelithiasis and. All laparoscopic cholecystectomies were initiated with a retrograde dissection (RD). In cases of difficulty in dissection or inability in clearly identifying the cystic pedicle components, the operation was continued using the FF approach. Patients who underwent LC in addition to other abdominal operations and/or underwent primary open surgery due to additional medical conditions were excluded from the study. Urgent conversions (hemorrhage or suspicious of malignancy) to open surgery were also excluded. The patients who underwent LC with RD or FF technique were defined as the RD or FF groups, respectively. Demographic data, indications for surgery, intraoperative findings, and the rate of complications were analyzed in these two patient groups.

Statistical analysis was performed using SPSS version 16.0.

Continuous variables were calculated as mean±SD, and compared using the Mann-Whitney U test. P<0.05 was considered statistically significant

RESULTS:

Of the 240 patients who underwent cholecystectomy, 30 patients were excluded who underwent LC simultaneously with another abdominal operation during the same session or had primary open surgery due to additional medical conditions (n=27), were converted to open surgery due to hemorrhage from the liver bed (n=2), or were intraoperatively suspected of having gallbladder malignancy (n=1). Therefore, 210 patients were included in this study. All 210 dissections were initiated with RD. A total of 197 operations (93.8%) were completed with RD and 13 (6.2%) with the FF technique. The mean duration of operation was significantly shorter in the RD group than in FF group (46.12±5.98 vs. 87.00±34.25, p<0.001) (table 1)

In the FF group, the main reason for converting from RD to FF was the inability for safe surgical dissection at the Calot's triangle due to dense fibrotic tissue in 11 patients who had either chronic (n=8) or acute (n=3) cholecystitis. The complication rates were significantly higher in the FF group than in the RD group [15.4% (2/13) vs. 1.5% (3/197), p<0.001. Postoperative complications were observed in three (1.4%) patients in the RD group.

DISCUSSION:

Laparoscopic cholecystectomy is the gold standard treatment for symptomatic cholelithiasis[8-11] and protecting vascular and biliary structures is essential during LC. In difficult cases, most surgeons consider conversion from laparoscopic to open surgery. The conversion rates to open surgery during LC range between 1% and 24%.[12-15] The conversion rate can be as high as 44% during LC in patients with acute gangrenous cholecystitis.[16] The use of FF and LPC techniques during difficult cases can avoid conversion to open surgery. In the study of Mah mud et al.,[17] the conversion rate to open surgery decreased from 5.2% to 1.2% with the use of FF technique. Gupta et al.[18] reported that the use of FF technique decreased the conversion rate from 18.8% to 2.1% in patients with chronic cholecystitis. In a recent review, it was reported that partial cholecystectomy and the FF technique resulted in decreased rate of complications[19] On the other hand, the FF technique can be hazardous in cases with thickened and shortened cystic plate due to inflamed gall bladder, and vasculobiliary injuries can occur because of the proximity of the right portal pedicle and bile duct in such patients.[20]. Attentive hemostasis is crucial to avoid blood staining of the dissection field. In our study, the use of FF technique instead

of RD was decided during the early stages of the operations, when RD was considered to be insufficient for safe dissection in difficult cases. The FF technique was used in 6.2% of our patients, and 2.8% of the patients underwent LPC.

Partial cholecystectomy might be considered as another surgical option for cholecystectomy during laparoscopy before deciding to proceed with open cholecystectomy. In a systematic review and meta-analysis, it was reported that partial cholecystectomy resulted in lower rates of common bile duct injury, but more frequent postoperative minor complications in difficult cholecystectomies.[6] Kulen et al.[21] analyzed the data of 80 patients with cholelithiasis who underwent LPC (n=40) and conversion cholecystectomy (n=40). Subhepatic collection, biliary fistula, and residual bile duct stones constituted the most frequent complications after LPC.[6,21] Palliative or minimally invasive techniques such as percutaneous drainage and ERCP are the most efficient treatments for such complications following LPC.[22] The incidence of postoperative ERCP after LPC was reported as 4.1%, and the most common indications for ERCP after LPC were retained stones (59%) and bile leakage (31.5%).[6] It is well-known that the rate of wound infection, bile leaks, CBD injury, and cardiopulmonary complications is lower in LPC than in open surgery.[22] Also, the median duration of hospitalization in open surgery is 3–10 days;[23] our median duration of hospitalization was 3.25 days (2–11 days). The use of RD or FF technique might affect the duration of surgery. In our study, the duration of operation was longer in the FF group than in the RD group. Neri et al.,[5] reported that the mean duration of surgery was 70 min and 90 min with the use of FF and RD technique, respectively. This study has some limitations. This was a retrospective study with small sample size, and follow-up evaluation was lacking in most of the cases without complication. The general approach in difficult cholecystectomy is performing LPC or conversion to open approach. In our study, we performed the FF technique before proceeding with LPC. We accomplished successful cholecystectomy in more than 50% (7/13) of the operations using the FF approach and avoided the potential complications of LPC in these patients. In the remaining patients (6/13), LPC was performed with an acceptable rate of minor complications

Conclusion:

it should be considered that conversion to open surgery is not a complication. In cases where the exploration cannot be performed safely, or in cases such as hemorrhage where open surgery is considered safer, one should not hesitate to convert to open cholecystectomy. The desire to complete the operation must not prevent finishing the procedure safely.

Table 1. Patient and operative characteristics for retrograde dissection and fundus-first groups

	Retrograde dissection group	Fundus-first technique group	p
Age, years (range)	44.29±13.36 (18-72)	42.38±6.27 (36-58)	0.36
Sex (female/male)	150/47	7/6	<0.05
Duration of surgery, min (range)	46.12±5.97 (30-65)	87.00±34.25 (55-145)	<0.001
Duration of hospitalization, days (range)	1.28±0.56 (1-3)	2.76±2.48 (2-11)	<0.001

REFERENCES:

1. Reynolds WJ Jr. The first laparoscopic cholecystectomy. *JLS* 2001;5:89–94.
2. Kato K, Kasai S, Matsuda M, Onodera K, Kato J, Imai M, et al. A new technique for laparoscopic cholecystectomy-retrograde laparoscopic cholecystectomy: an analysis of 81 cases. *Endoscopy* 1996;28:356–9.
3. Henneman D, da Costa DW, Vrouwenraets BC, van Wagenveld BA, Lagarde SM. Laparoscopic partial cholecystectomy for the difficult gallbladder: a systematic review. *Surg Endosc* 2013;27:351–8.
4. Wolf AS, Nijssen BA, Sokal SM, Chang Y, Berger DL. Surgical outcomes of open cholecystectomy in the laparoscopic era. *Am J Surg* 2009;197:781–4.
5. Neri V, Ambrosi A, Fersini A, Tartaglia N, Valentino TP. Antegrade dissection in laparoscopic cholecystectomy. *JLS* 2007;11:225–8.
6. Elshaer M, Gravante G, Thomas K, Sorge R, Al-Hamali S, Ebdewi H. Subtotal cholecystectomy for "difficult gallbladders": systematic review and meta-analysis. *JAMA Surg* 2015;150:159–68.
7. Strasberg SM, Brunt LM. Rationale and use of the critical view of safety in laparoscopic cholecystectomy. *J Am Coll Surg* 2010;211:132–8.
8. Johansson M, Thune A, Nelvin L, Lundell L. Randomized clinical trial of day-care versus overnight-stay laparoscopic cholecystectomy. *Br J Surg* 2006;93:40–5.
9. Perissat J. Laparoscopic cholecystectomy: the European experience. *Am J Surg* 1993;165:444–9.
10. Scott TR, Zucker KA, Bailey RW. Laparoscopic cholecystectomy: a review of 12,397 patients. *Surg Laparosc Endosc* 1992;2:191–8.

11. Berggren U, Gordh T, Grama D, Haglund U, Rastad J, Arvidsson D. Laparoscopic versus open cholecystectomy: hospitalization, sick leave, analgesia and trauma responses. *Br J Surg* 1994;81:1362–5.
12. Araujo-Teixeira JP, Rocha-Reis J, Costa-Cabral A, Barros H, Saraiva AC, Araujo-Teixeira AM. Laparoscopy or laparotomy in acute cholecystitis (200 cases). Comparison of the results and factors predictive of conversion. *Chirurgie* 1999;124:529–35.
13. Lo CM, Fan ST, Liu CL, Lai EC, Wong J. Early decision for conversion of laparoscopic to open cholecystectomy for treatment of acute cholecystitis. *Am J Surg* 1997;173:513–7.
14. Mattioli FP, Cagnazzo A, Razzetta F, Bianchi C, Valardo E, Campagna A, et al. Laparoscopic cholecystectomy. An analysis of the reasons for a conversion to conventional surgery in an elective surgery department. *Minerva Chir* 1999;54:471–6. 15. Parra Blanco JA, Bueno López J, Madrazo Leal C, Fariñas Alvarez C, Torre Carrasco F, Fariñas MC. Laparoscopic cholecystectomy: analysis of risk factors for predicting conversion to open cholecystectomy. *Rev Esp Enferm Dig* 1999;91:359–64.
16. Koperna T, Kissler M, Schulz F. Laparoscopic versus open treatment of patients with acute cholecystitis. *Hepatogastroenterology* 1999;46:753–7.
17. Mahmud S, Masaud M, Canna K, Nassar AH. Fundus-first laparoscopic cholecystectomy. *Surg Endosc* 2002;16:581–4.
18. Gupta A, Agarwal PN, Kant R, Malik V. Evaluation of fundus-first laparoscopic cholecystectomy. *JLS* 2004;8:255–8.
19. Hussain A. Difficult laparoscopic cholecystectomy: current evidence and strategies of management. *Surg Laparosc Endosc Percutan Tech* 2011;21:211–7.
20. Strasberg SM, Gouma DJ. 'Extreme' vasculobiliary injuries: association with fundus-down cholecystectomy in severely inflamed gallbladders. *HPB (Oxford)* 2012;14:1–8.
21. Kulen F, Tihan D, Duman U, Bayam E, Zaim G. Laparoscopic partial cholecystectomy: A safe and effective alternative surgical technique in "difficult cholecystectomies". *Ulus Cerrahi Derg* 2016;32:185–90.
22. Philips JA, Lawes DA, Cook AJ, Arulampalam TH, Zaborsky A, Menzies D, et al. The use of laparoscopic subtotal cholecystectomy for complicated cholelithiasis. *Surg Endosc* 2008;22:1697–700.
23. Schirmer BD, Edge SB, Dix J, Hyser MJ, Hanks JB, Jones RS. Laparoscopic cholecystectomy. Treatment of choice for symptomatic cholelithiasis. *Ann Surg* 1991;213:665–76.