

Reduced Port Laparoscopic Cholecystectomy: Single and a Half Incision Lap Chole

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Abstract Laparoscopic cholecystectomy has almost replaced the age-old procedure of open cholecystectomy for gall stone disease. Further attempts are made to reduce the number of ports to give maximum benefits of minimally invasive surgery. The author has developed a technique where 10-mm port in supraumbilical area and 5-mm port in epigastric area are used and hence the nomenclature of single and a half incision laparoscopic cholecystectomy. It is different from two-port laparoscopic cholecystectomy where the second port is 10 mm. In total, 69 cases are performed without any complication. Conclusion: In our technique of single and a half incision laparoscopic cholecystectomy patients' safety is as much as in a conventional four-port surgery. Surgeon is comfortable to perform this operation. Cosmetically, it is better than four-port laparoscopic cholecystectomy without increase in cost. So, in our opinion, our technique should be acceptable to all surgeons and can give benefits of minimal access surgery to masses of people.

Keywords Reduced port · Single and a half incision · Laparoscopic cholecystectomy

Open cholecystectomy has been performed since 1882 in every corner of the world. It was the only choice of operation for gall stone disease. Then came laparoscopic cholecystectomy (LC) almost replacing that age-old procedure. And now, LC has reached an important hallmark with development of single

incision lap cholecystectomy (SILC). Reduced port specially SILC has failed to take momentum the way conventional LC could take. The aim of our study is to assess the benefits as well as difficulties of single and a half incision lap-cholecystectomy, keeping in mind (i) the highest safety of the patient, (ii) the surgeon's comfort to perform the surgery, and (iii) minimal increase in cost, if at all.

Material and Method

We have been doing four-port conventional LC since 1995. During our journey in port reduction, we switched to three-port lap chole and then to two ports. Since July 2011, we have further reduced to single and a half incision LC and have performed 69 cases upto June 2014. Cases with acute cholecystitis and acute pancreatitis and with history of previous abdominal surgery are excluded from our study. Subsiding acute calculous cholecystitis and subsiding acute biliary pancreatitis are taken up after 4 weeks.

In conventional LC, the first incision is 1 cm in supraumbilical area and the second incision is 1 cm in the epigastrium besides 5-mm port at right mid clavicular and at right anterior axillary line. In our study of single and a half incision LC, the first incision is the same and the second incision is only 5 mm in the epigastrium and hence the nomenclature. It is different from two-port LC where the second port is also 10 mm.

Special instruments like Stryker's Alligator grasper with built-in needle are used at the right mid clavicular point to hold the Hartman's pouch. An Alligator forcep is reused more than 20 times after ETO sterilization. Five-millimeter instruments like Maryland dissector, scissor, suction, and 5-mm clip applicator are used through the second port exactly in the same way as in four-port LC. For fundal retraction, whenever

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needed, we have used fundal stitch (8 cases) Roeder Knot (31 cases) and second Alligator grasper (9 cases). In 21 cases, we could manage without fundal retraction. Whenever needed, a 10-mm clip applicator is used through supraumbilical port under guidance of 5 mm laparoscopic view through the 5-mm epigastric port (Fig. 1).

GB retrieval is done through the supraumbilical port under guidance of 5 mm laparoscopic view through the epigastric port (Fig. 2).

Results

Range of operating time is 1 h to 1 h 15 min. Only in one case of subsiding acute pancreatitis operating time is 2 h and 20 min. There is no complication, intraoperative nor postoperative in our series. VAS for pain, 4 h after operation, is 7–9 and need one injection of analgesics. One injection of sedation is also given at 10 pm. Pain on the 1st postoperative day is minimum (VAS 3), needing only oral analgesics. All patients are discharged on the 2nd postoperative day. All patients joined their regular duties by 2 weeks. Follow-up of the cases is upto 6 months.

Discussion

Though four-port LC is the gold standard procedure around the world, recent developments in LC have been towards reducing the number of ports to achieve the goal of minimal access surgery. Less abdominal wall trauma and subsequently less postoperative pain and early recovery are major goals. In single and a half incision LC technique, our observation is that



Fig. 1 Ten-millimeter clip applicator is used through the supraumbilical port under guidance of 5 mm laparoscopic view through a 5-mm epigastric port



Fig. 2 GB retrieval is done through the supraumbilical port under guidance of 5 mm laparoscopic view through the epigastric port

by adding only one 5-mm port in the epigastrum to routine 10-mm port in supraumbilical position, the procedure becomes very safe and easier than SILC. Addition of 2.3 mm needle through which Stryker's Alligator forcep works, add all the advantages without adding any pain or scar. In SILC, there are safety concerns regarding the technique due to the possible decreased visualization or exposure, with lack of triangulation and clashing of instruments. But in single and a half incision LC, neither of these difficulties are encountered. Visualization of the operation site is very good achieving critical view of safety. Also, there is no blind dissection nor blind clipping. So our technique is easier and safer than SILC. Addition of a needle or a thread or a metal wire through the abdominal wall without addition of a trochar for Hartman's pouch retraction or for fundal retraction is also acceptable and does not change the nomenclature [1]. Ergonomics in our procedure is very good and the surgeon is as comfortable as in the four-port conventional LC. Because of good ergonomics of hand instruments, learning curve is very short. History of medicine has proved that a procedure becomes popular or ideal—(i) when it is complication free, (ii) cost effective, (iii) results are reproducible, (iv) procedure is not cumbersome or difficult, and (v) can be performed even in peripheral hospitals, not only in center of excellence in some cities. In our experience, single and a half incision LC fulfills these criteria.

Cosmetically also single and a half incision LC is very good and very much acceptable to all patients. For all practical purposes, only a small 5-mm scar is seen in epigastrum. As the alligator forcep is reused more than 20 times, there is no increase in cost for our patients.

We have faced slight difficulty in doing Calot's dissection if the GB is big, long, and hanging. In such cases, fundus retraction is helpful. We find Roeder Knot (Fig. 3) is much better for fundus retraction than needle or stitch. Needle or



Fig. 3 Roeder knot is put to hold and retract the fundus of the GB

stitch in fundus given for retraction can sometimes complicate the situation by bile leakage or even stone spillage. In a difficult situation needing more fundal retraction, second Alligator grasper through right anterior axillary line can be used.

Difficulty is also felt if the left lobe of the liver is big and hanging over the GB.

This is manageable by adjusting the traction on the Hartman's pouch as needed and by lowering the elevation of the head end of the OT table.

We also faced difficulty if there is an impacted big stone in the Hartman's pouch. This can be managed by adjusting the traction by the Alligator forcep on the GB near to the Hartman's pouch or retracting at the Hartman's pouch and cystic duct junction.

Average pain score of VAS 7–9 at 4 h after the operation and VAS 3 on 1st postoperative day in single and a half incision LC is comparable to four-port conventional LC. We find no difference in analgesic requirement in our cases in comparison to conventional LC.

Operating time in single and a half incision LC is very much comparable to conventional LC.

We have converted three cases to conventional four-port LC due to adhesions and unclear anatomy. Out of these three cases, we have again converted one case to open cholecystectomy.

Conclusion

Four-port conventional LC is definitely the gold standard procedure but we are of the opinion that four ports are not always necessary for uncomplicated gall stone disease. Patient's safety in our technique of single and a half incision LC is as much as in conventional LC. Time taken for this procedure is reasonable. Surgeon is very comfortable to perform as in four-port LC. Learning curve for the surgeon who are already doing four-port LC is short. Cosmetically, it is better than conventional LC without increase in cost. So we are of the opinion that our technique is very much patient-friendly and surgeon-friendly and should be acceptable to all surgeons, even in peripheral hospitals, giving benefit of minimal access surgery to masses of people.

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Compliance with Ethical Standards

Source of Support None.

Conflict of Interest The authors declare that they have no competing interests.

Reference

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Previous related presentations:

1. Single and a half incision lap chole: How and why I do it. AMASICON 2012, Coimbatore.
2. Single and a half incision lap chole: How and why I do it. World Laparoscopy Congress, 2012, Gurgaon.