Surgery Clinics Journal

ISSN: 2687-6973

Research Article

Reduced Port Laparoscopic Cholecystectomy-Our Experience in a Tertiary Care Teaching Hospital

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Abstract

Laparoscopic Cholecystectomy is the gold standard procedure for removal of gallbladder. Over the years there has been newer methods of performing minimal access Laparoscopic Cholecystectomy like Reduced port Laparoscopic Cholecystectomy, Single Incision Laparoscopic Cholecystectomy (SILS), Natural Orifice Transluminal Endoscopic Surgery (NOTES) Cholecystectomy. Reduced Port Laparoscopic Cholecystectomy seems to be practically feasible due to the fact that no special instruments are required for this procedure cost effective, with minimal compromise in ergonomics of surgery. Cosmetically giving better results than conventional Laparoscopic Cholecystectomy.

Materials and methods: Here we report a series of 5 cases of Reduced Port Laparoscopic Cholecystectomy for Calculous Cholecystitis that we have performed in Saveetha Medical College and Hospital. By analysing patient factors, presenting complaints, preoperative findings, postoperative pain and complications.

Results: In all these patients we were able to perform Reduced port Laparoscopic Cholecystectomy successfully. The patients were discharged on post op day 3 with low pain score and good cosmetic outcome.

Conclusion: We find that Reduced port Laparoscopic Cholecystectomy with conventional instruments is feasible and safe method of removal of gallbladder laparoscopically in selected cases with advantage of reduced postoperative pain and good cosmetic outcome for the patient than Conventional Laparoscopic Cholecystectomy.

Keywords: Laparoscopic cholecystectomy; Reduced port surgery; Single incision multiport

Introduction

Laparoscopic Cholecystectomy (LC) has become the gold standard in surgical treatment of gallstone disease. Conventional laparoscopic cholecystectomy generally is performed through four port technique. Less abdominal wall trauma and subsequently less postoperative pain and early recovery are the major goals. Though four-port LC is the gold standard procedure around the world, developments in LC have been towards reducing the number of ports to achieve the goal of minimal access surgery. Apart from conventional laparoscopic cholecystectomy many other modifications, this conventional cholecystectomy has gone through. On such modification is reduced port laparoscopic cholecystectomy. Others include Hybrid Laparoscopic Cholecystectomy, Lap cholecystectomy done by small sized instruments (3 mm), Reduced Port (Number) Laparoscopic Cholecystectomy by taking suture in fund us of the gall bladder tying it to the abdominal wall, Using endoclips to cause retraction of gall bladder, Reduced port size with reduced port numbers in LC, Single Incision Laparoscopic Cholecystectomy (SILS), Natural Orifice Transluminal Endoscopic Cholecystectomy (NOTES).

Amongst the above different types of surgeries there are advantages and disadvantages. For example Natural Orifice Transluminal Cholecystectomy (NOTES) is not practiced because of its cumbersome nature of the technique used. In SILS cholecystectomy special ports has to be used which involves lots of expenditure and even hand instruments including specialised roticulating instruments has to be used to achieve triangulation inside the abdomen which again involves lots of expenditure. Ergonomics in our procedure is good and the surgeon is as comfortable as in the four-port conventional Laparoscopic Cholecystectomy. Because we use conventional ports and conventional hand instruments, the cost of the surgery doesn't go up. With minimal modifications in instrumentation, like using a low profile trocar, etc we were able to do this reduced port surgery effectively. A surgical procedure becomes ideal one-(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 centre of excellence in some cities. In our experience, 3 port Laparoscopic Cholecystectomy fulfils these criteria.

Materials and Methods

This study was conducted at the department of General Surgery, Saveetha medical college and hospital. Five patients with symptomatic gallstone disease were admitted for elective surgery.

Study design: The patients were evaluated and routine work up done in the out-patient department and then admitted for surgery. All patients diagnosed with cholelithiasis alone were included, other finding like choledocholithiasis, pancreatitis, portal hypertension

Citation: Sudarshan PB, Bubeshver VS, Agil S, Gowtham R, Reddy B. Reduced Port Laparoscopic Cholecystectomy-Our Experience in a Tertiary Care Teaching Hospital. Surg Clin J. 2021; 2(6): 1042.

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Publisher Name: Medtext Publications LLC

Manuscript compiled: Jan 05th, 2021

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were exclude. Prophylactic dose of antibiotic was given just prior to induction. Conventional laparoscopic cholecystectomy generally is performed through four small incisions in the abdominal wall. The four ports in standard LC are, One 10 mm optical port through the umbilical area 10 mm 30° telescope is routinely used, 10 mm operating port on the epigastric area, 5 mm operating port in right subcostal region in midclavicular line, 5 mm assistant port in right subcostal anterior axillary line to retract the fundus.

In our study reduced port laparoscopic cholecystectomy was done by using Single incision multiport technique Mickey mouse technique (Figure 1) [1-8] which is 10 mm umbilical port for camera, one 5 mm operating port in the umbilicus through single umbilical incision, one 5 mm working port in the epigastrium (Figure 2). The fundus of the gall bladder was retracted using 5 mm umbilical port (Figures 3 and 4).

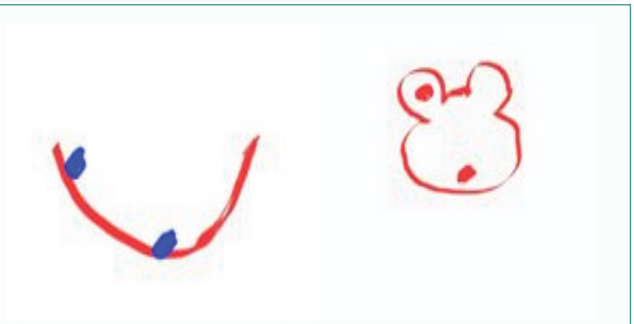

Figure 1:Mickey Mouse pattern of trocar insertion.

A single curvilinear incision is made in lower border of umbilical crease for 2 cm. Veress needle is introduced to create pneumoperitoneum. Ten millimeter trocar is introduced through the rectus sheath in the middle of this incision (6'o clock position). Five millimeter trocar is introduced through the same skin incision at 9'o clock position via a different entry into the rectus sheath. This 5 mm trocar is a low profile trocar. Instead of a 10 mm port at epigastrium, here we introduced a 5 mm epigastric port. A conventional 10 mm 30° telescope introduced through 10 mm port. For all the patients we did a diagnostic laparoscopy and proceeded with the surgery only after ruling out any adhesions and proceeded with reduced port surgery only when the anatomy is clear with no or minimal adhesions. If dense adhesions are present we converted it to conventional laparoscopic cholecystectomy. Five millimeter umbilical working port is used for grasping and retracting the fundus and Hartmann's pouch of the gallbladder with a 5 mm bariatric atraumatic grasper of 45 cm length. This modification was helpful in avoiding clash between the instrument and telescope/camera head. Using the Maryland instrument and bipolar through the epigastric port calot's triangle and the cystic duct and artery are skeletonised as in the four-port technique. For 3 cases we used single-hand knotting technique for ligating cystic duct with 2/0 vicryl. Cystic artery was cauterised with bipolar cautery in all cases. Alternatively, the position and size of the scope is changed to a 5 mm 30° scope through the epigastric port and clips (titanium) are applied to cystic duct through the 10 mm umbilical port for 2 cases. Gall bladder removed from the bed using an L hook cautery (Figure 5). Gallbladder specimen is retrieved through the umbilical port by rail-road technique or using 5 mm 30° scope through the epigastric

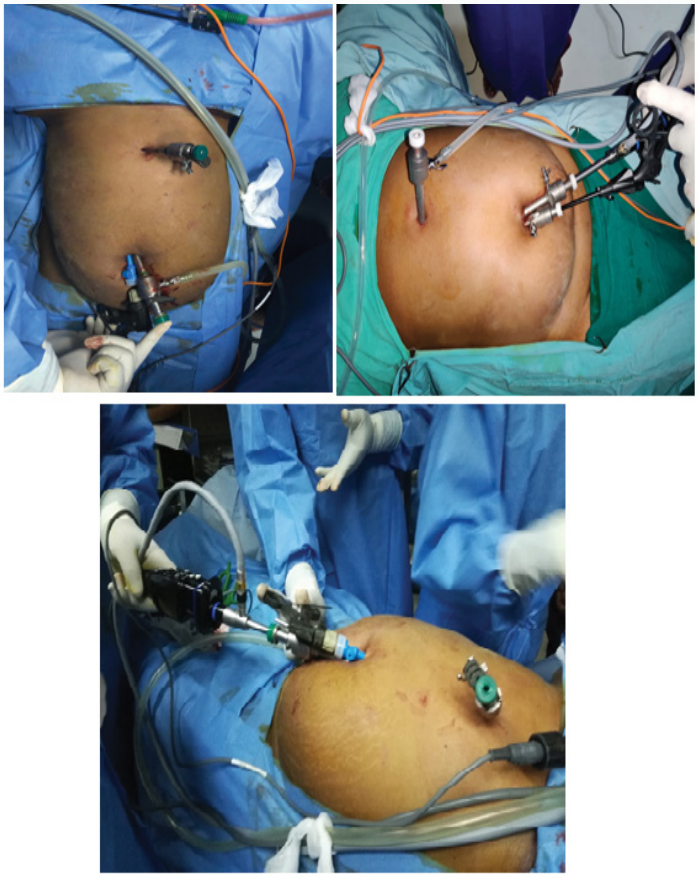

Figure 2: Port placement (Single incision multiport technique).

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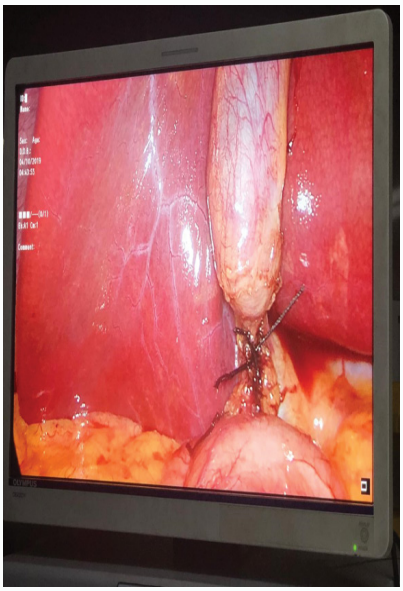

Figure 3: Single hand knotting of cystic duct.

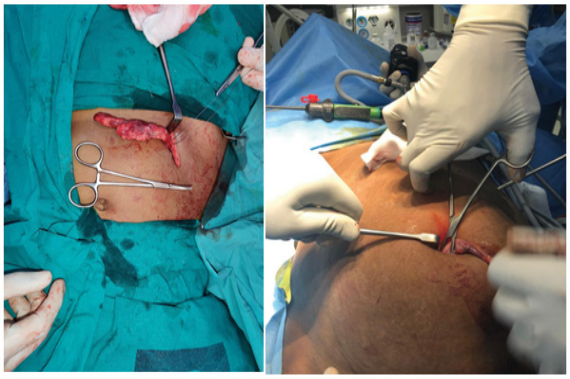

Figure 4: Retrieval of specimen through umbilical port.

port and 10 mm jaw forceps from the umbilical port. We closed the 5 mm and 10 mm port in umbilical incision with 1-0 port closure vicryl. Skin closed with 3-0 Ethilon (Figure 6). The outcomes were measured in terms of operating time, conversion rate, intra-operative complications, immediate post-operative complications, pain score, analgesic requirement and hospital stay. Conversion rate include conversion to open cholecystectomy. Intra-operative complications include gall bladder wall perforation, bile leak, bleeding from liver bed, and bile duct injury. Postoperative pain was recorded by VAS (Visual Analog Score).

Results

A total of 5 patients, with a diagnosis of symptomatic gallstone disease, which underwent laparoscopic cholecystectomy were collected. Following parameters were observed and analysed. In our present study there were 5 patients with age group between 20 to 40 years all were female patients. Most of the patients had multiple GB stones, only one patient had single GB stone. Four patients have normal GB wall with one patient had thickened GB wall. None of these have peri GB collection.

In the present study symtomatology distribution of patient's

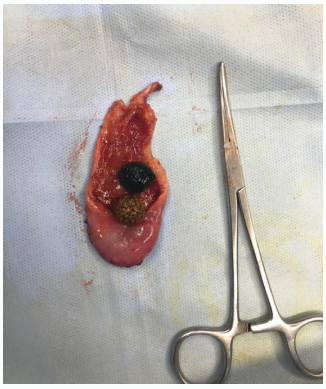

Figure 5: Gallbladder specimen.

Figure 6: Postop wound.

shows abdominal pain in of patient as a most common symptom. All the patients were managed laparoscopically without any conversion to open technique. None of them had any complications during surgery. Most of the patients were discharged on post operative day 2. Post operative pain measured by VAS was found to be <5 for all the patients.

Discussion

Gallstone disease is a global health problem. Laparoscopic Cholecystectomy has become the gold standard for the surgical treatment of gallbladder disease. A shorter hospital stay and rapid return to normal activity and work, less postoperative pain, a faster recovery and lower cost and better cosmetics are some of the advantages of Laparoscopic Cholecystectomy. Conventional Laparoscopic cholecystectomy is performed using a four-port technique [1]. Several modifications discussed above have some advantages and disadvantages. Single Incision Laparoscopic Cholecystectomy (SILS) is developed to minimize the invasiveness of laparoscopic surgery by reducing the number of incision. The advantages are superior cosmetic results, reduces the rate of wound complications such as infection, hematoma, and hernia. Disadvantages are collision of instruments both within and outside the abdomen as a result of their common entry point ("sword fighting"), inadequate triangulation, and compromised field of view due to obstruction by instruments entering the common port, inadequate exposure and retraction. NOTES Cholecystectomy may be transvaginal, transgastric, or transcolonic. Disadvantages

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includes need for newer instrumentations, dyspareunia in the long-term, Ethical dilemmas in using vagina, injury to rectum during vaginal puncture has also been reported.

In our study we use three port (single incision multiport technique) LC. These modifications reduced the pain and analgesic requirements [2,3]. The phenomenon of reduced pain due to reduced number and sizes of the ports has been established by researchers [3,7]. In the present study, abdominal pain is the most common symptom. A randomised study evaluating postoperative pain in patients undergoing three trocar *vs.* four-trocar cholecystectomy demonstrated very less amount of analgesic use in the three-trocar group [4,8]. The three-port LC might be difficult in some situations such as thick wall of the gallbladder, impacted calculus at Hartman's pouch, gallbladder empyema, severe adhesions especially at Calot's triangle, and acute cholecystitis [9-14]. In the new era of minimal access surgery, the outcomes of surgery under consideration are not only safety, but also quality, which is often defined by pain and cosmetic results of the patient. Minimal scar and less hospital stay is the ultimate goal for both surgeons and patients. As the three-port LC is a relatively new technique, we believe that with increasing experience, the operative time will be less have good cosmesis without any added expenditure.

Conclusion

Reduced poer LC as described in present study is a safe method of performing LC with added advantage of better cosmesis when compared with other type of reduced port Laparoscopic cholecystectomy. It has also had added benefit of cost effectiveness because we use conventional instruments. However only restraining factor is that reduced port laparoscopic cholecystectomy is feasible only in elective Cholecystectomy cases and not in acute cases where acute inflammation and dense adhesions will be present. We have to do a diagnostic laparoscopy and proceed with the surgery.

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