LAPAROSCOPIC CHOLECYSTECTOMY FOR EMPYEMA GALL BLADDER

Muhammad Shoaib Hanif, Iftikhar Ahmed Chaudry, Shehzad Ahmed Abbasi, Muhammad Rashid Hasnain

Combined Military Hospital Peshawar/National University of Medical Sciences (NUMS) Pakistan

ABSTRACT

Objective: To describe the experience of treating empyema gall bladder with laparoscopic cholecystectomy.
Study Design: Descriptive observational study.
Place and Duration of Study: The study was carried out at Combined Military Hospital (CMH) Peshawar, from Feb 2012 till May 2014 for a period of twenty eight months.
Material and Methods: Twenty eight patients were enrolled in the study who fulfilled the criteria for empyema and were willing for laparoscopic cholecystectomy, chances of conversion to open cholecystectomy and risk of complications involved. We defined the operative difficulty levels according to the intra-operative findings. Level 1-adherent omentum, level 2–oedematous gall bladder wall, level 3–necrotic gall bladder wall, level 4–adherent gut and level 5 – adherent Hartmann's pouch and oedematous Calot's triangle having no defined planes. The results were noted in terms of time taken for the operation and complications of the operative procedure.
Results: Twenty eight patients of empyema gall bladder underwent laparoscopic cholecystectomy. Mean age was 46.2 ± 7.1 years. Average duration of symptoms was 4.1 ± 2.3 days. Two patients had level-I operative difficulty, 6 patients had level-II difficulty, 9 patients had level-3 difficulty, 2 patients had level-IV difficulty and 9 patients had level-V difficulty. In 21(75%) patients total cholecystectomy was performed, anterior partial cholecystectomy was done in 2 patients (7.1%) and 5 patients (17.9%) were converted to open cholecystectomy. One patient (3.5%) had Stresburgh Bismuth type D injury and was managed by open exploration and T-tube placement. No mortality was encountered in the study group.
Conclusion: The technique of laparoscopic cholecystectomy can be used effectively for treating empyema gall bladder specifically in American Society of Anaesthesiologists (ASA) I & II patients. Further randomized controlled trials can elaborate its efficacy. This will not only prove to be cost effective but it will also add to the comfort of the patient.

Keywords: Empyema gall bladder, Laparoscopic cholecystectomy.

INTRODUCTION

Minimally invasive surgery has evolved as a philosophy of treatment rather than a modality of treatment. Since the first laparoscopic cholecystectomy (LC) in mid 1980s, the technique of laparoscopic surgery has risen to a point whereby it has overtaken priority over open surgery in some fields[1]. By far laparoscopy is now exhibiting lesser and lesser operative time and increasing safety levels in terms of the associated complications[2].

Over these decades the surgical expertise has grown and now procedures with higher difficulty level are attempted. Thus more and more surgical patients are being treated with varied modalities of minimal access therapy. As we focus on the history of LC we find that this changing aptitude is also applicable for empyema gall bladder. Since 2002 various centres have been studying the prospects of early laparoscopic cholecystectomy and lately parameters have been defined for early cholecystectomy[3]. Now laparoscopic surgeons all over the world would be setting off with laparoscopic techniques for treatment of empyema gall bladder.

We have applied the principles of early LC in our setup especially for empyematous gall bladders. In this case series we present our procedure and observations.

Correspondence: Dr Muhammad Shoaib Hanif, Dept of Minimally Invasive Surgery CMH Peshawar Pakistan
Email: muhammadshoaibhanif@hotmail.com
Received: 30 Sep 2014; revised received: 26 May 2015; accepted: 10 Jul 2015

PATIENTS AND METHODS

This is a descriptive study that was carried out at Combined Military Hospital (CMH) Peshawar, a tertiary care centre for minimal access therapy. The study was carried out form Feb 2012 till May 2014. Adult patients of both sexes, all races/ethnicity were considerd for the study, provided they met the diagnostic criteria for empyema gall bladder. There is a lot of material in various textbooks but the best summarization that we used is mentioned in e-medicine[4]. This diagnosis was reconfirmed by the histopathology report of the extracted gall baldder. Only those patients were included in the study who were categorised as American Society of Anaesthesiologists (ASA)–I or II. The patients with deranged vital signs or signs and symptoms of toxicity were excluded from the study. All patients who were diagnosed as empyema gall bladder underwent pre-anaesthesia assessment. The patients were kept nil per orum atleast 6 hours before the surgery. Four port approach was used, the umbilical port was used for the camera, the epigastric port for the Maryland dissector, right hypochondrial port was used for the grasper, and the right lumber/ iliac fossa port was used for the self-retaining Allis retractor. After achieving pneumoperitoneum and having all four ports in place the gall balder was evaluated We gauged the difficulty levels according to the degree of the distention, thickness of gall bladder wall, omental adhesions as defined below

- Level 1 – Adherent omentum
- Level 2 – Oedematous and friable gall bladder wall
- Level 3 – Necrotic gall bladder wall
- Level 4 – Adherent gut
- Level 5 – Adherent Hartmann's pouch and oedematous Calot's Triangle with ill defined dissection planes.

First the fundus of gall bladder was identified and adherent omentum if any was detached. The retrieval bag and gauze piece were introduced in the operative field. After identifying the fundus a hole was made in the gall bladder and suction/irrigation cannula was introduced inside the gall bladder (fig).

All bile/ infective material was sucked out and low pressure irrigation done to achieve clear fluid from inside the gall bladder. This hole was grasped in the self-retaining Allis retractor such that no spillage of contents occurred. If deemed necessary the hole was stitched close with the help of silk 2/0 using the intra-corporeal suturing technique. Next the omental adhesions were cleared and the Hartmann's Pouch was mobilised. The Calot's triangle was dissected and the peritoneal reflection was opened all over the triangle of safety. The common bile duct (CBD) was defined, cystic duct was isolated and its junction with the CBD was identified beyond doubt. Patients in which the Calot's Triangle was frozen and dissection could not proceed were excluded from the study. The cystic artery was identified and divided between clips. Cystic duct was then identified and divided between the clips. Subsequently the gall bladder was

Table: Average operating time and hospital stay in different difficulty levels.

Difficulty level	No of Patients (f)	Average operating time (hrs)	Post-op Hospital stay (days)
1	2 (7.1%)	56.5 ± 3.5	2.5 ± 0.5
2	6 (21.4%)	82.7 ± 4.7	3.2 ± 0.4
3	9 (32.1%)	106.1 ± 6.8	3.3 ± 0.5
4	2 (7.1%)	135 ± 3	4
5	2 (7.1%)	150 ± 3	4.5 ± 0.5
5 - Anterior Partial	2 (7.1%)	180 ± 9.8	5.2 ± 0.7
5 - Conversion to open	5 (17.9%)	130 ± 7.6	7.5 ± 0.3

dissected out. If the posterior wall was very thick and densely adherent to liver bed then actually a cleavage plane was created in the gall bladder wall itself and a part of the wall was left behind adherent to the liver, leaving a last portion of fundal attachment. All patients requiring an anterior partial cholecystectomy were excluded from this study. This attachment helped in retraction of the liver and access to the gall bladder bed for hemostasis and cleansing. The gall bladder bed was thoroughly irrigated and cleaned taking extreme care not to dislodge the clips that were placed on the cystic artery and cystic duct. After hemostasis and cleaning the gall bladder resection was completed and the resected gall bladder was received in extraction pouch and extracted. An 18 Fr multihole drain was placed in the gall bladder bed and drained out from the right iliac fossa port. Omentum was tucked into the subhepatic space and all ports extracted. Post operatively the patient was nursed in high dependency unit for 24 hours and signs of any covert injury were monitored. Subsequently the patient was shifted to the ward and allowed oral diet. The multihole drain was kept till drainage was less than 50ml in 24 hours. The patient was discharged after 24hrs of observation after removal of drain.

Data Analysis

All data were recorded and analysed in Microsoft Excel and descriptive statistics were used to describe the results.

RESULTS

During the period under study 28 patients were attempted with laparoscopic cholecystectomy. In 21 (75%) patients we were able to proceed with complete cholecystectomy, in 2 (7.14%) patients we performed laparoscopic anterior partial cholecystectomy while in 5 (17.9%) patients we converted to open cholecystectomy. The patients in which laparoscopically a complete cholecystectomy was carried out there were 13 males and 8 females. Mean age was 46.2 ± 7.1 years. Average duration before presenting to the hospital was 4.1 ± 2.3 days. The number of patients in each level of difficulty and their average operating time is given in table. The drain was removed on 2.38 ± 0.65 days. Four patients had perforation of gall bladder during the procedure out of which 2 had spillage of contents bile/stones into the gall bladder bed. Five patients had excessive bleeding that occluded the vision and required packing and diathermy. One patient had CBD injury which was 1 mm in size. This patient had a level 5 operative difficulty and the injury became evident as a persistent leakage of bile in the drain after the operation. The injury was addressed on 2nd postop day by undertaking a laparotomy and t-tube placement. We had port site infection in 2 patients only. The reason for conversion to open cholecystectomy was difficult dissection due to extremely friable tissues especially in the Calot's triangle. No mortality was recorded in the study group.

Figure: Suction cannula inserted inside a grossly inflamed gall bladder to suck out the infective material.

DISCUSSION

Cosmesis in surgery has always been the foremost of concerns by the patients, alongwith early return to work[5,6]. Commensurately the surgeons have been continuously devising incisions and procedures that leave the patient with minimum disfigurement. Laparoscopic procedures have been a revolution in this regards. Undoubtedly the comfort level of the patient and the convalescence times are unmatchable and these laborious techniques do repay[1]. This is the reason that uncomplicated

biliary colic is one of the commonest indications for LC[2]. The benefits are much increased when the wound infections are avoided in the contaminated or infected surgeries[7].

Since February 2012 we have endeavoured to deal with all gall bladders laparoscopically whenever time and resources permitted. This description of ours is not a randomised controlled trial but will definitely become a preclude to a formal study at some advanced center. In this endeavour we have found that empyematous gall bladder can be treated laparoscopically if one is well versant with techniques of laparoscopic partial cholecystectomy, laparoscopic management of the remnants of gall bladder and laparoscopically managing the spilled bile in the peritoneal cavity[8,9]. So with our experience we find to have now reached a stage, where with adequate precautions, we are able to prevent generalized contamination of peritoneal cavity or slipping of loose stones. At the same time we extracted the diseased gall bladder with minimum morbidity. Although we have not objectively studied it but clinically we have felt that the effectiveness was especially marked in obese patients. This fact has already been outlined by Simopolous et al in their study on LC of a non-inflammed gall bladder in obese patients[10].

When we started off with this endeavour we were a bit reluctant to accept the perforation of gall bladder or the generalized ooze that makes the visualizations difficult and the lost dissection planes due to overwhelming oedema in the Calot's triangle. But by and by as our technique is maturing we are becoming increasingly brave indeed. We suck out all the bile at the first instance to avoid the biliary soiling of peritoneum, we keep the collection pouch inside right from the very beginning to cater for any loose gallstones and we introduce the gauze piece in operative field very early as it takes care of excessive ooze by absorbing it and helps in blunt dissection in obliterated planes. We never hesitate going in for a partial cholecystectomy in difficult and oedematous Calot's triangle.

Amongst all these procedures, only once we felt troubled when one of our patients had excessive drainage of bile in the subhepatic drain. Initially we observed it for 24 hours but due to high suspicion of duodenal injury we felt safe to proceed for open exploration. The lady had a 1mm rent in the CBD and was a type D injury as per Strasburg-Bismuth classification[11,12]. This was dealt with by placing a T-tube and subsequent management. The patient had a level V operative difficulty. In two other patients of level V difficulty we performed an anterior partial cholecystectomy but it took us over three hours to complete the procedure laparoscopically, while in 5 patients with a Level V operative difficulty we had to resort to conversion to open cholecystectomy. We have noted that this subgroup had a significantly lower operative time as compared with other patients having a same level of operative difficulty.

After having reached this far we have a clinical impression that early laparoscopic cholecystectomy especially for empyema gall bladder is very beneficial as also has been outlined by Kwon et al[3]. As for the use of our technique it would still require to undergo a randomised trial before we can really advocate its superiority over open cholecystectomy. The newly described Vivek-Augustine scoring system for difficult laparoscopic cholecystectomy may also be of some future usage[13].

CONCLUSION

The technique of laparoscopic cholecystectomy can be used effectively for treating empyema gall bladder specifically in American Society of Anaesthesiologists (ASA) I & II patients.

Further randomized controlled trials can elaborate its efficacy. This will not only prove to be cost effective but it will also add to the comfort of the patient.

CONFLICT OF INTEREST

This study has no conflict of interest to declare by any author.

REFERENCES

1. Tan-Tam C, Chung SW. Mini review on laparoscopic hepatobiliary and pancreatic surgery. World J Gastrointest Endosc 2014; 6(3): 60-67.
2. Gurusamy KS, Koti R, Fusai G, Davidson BR. Early versus delayed laparoscopic cholecystectomy for uncomplicated biliary colic. Cochrane Database Syst Rev 2013.
3. Kwon YJ, Ahn BK, Park HK, Lee KS, Lee KG. What is the optimal time for laparoscopic cholecystectomy in gallbladder empyema? Surg Endosc 2013; 27(10): 3776-80.
4. URL : http://emedicine.medscape.com/article/174012-workup
5. Olweny EO, Mir SA, Best SL, Park SK, Donnally IC, Cadeddu JA, Tracy CR. Importance of cosmesis to patients undergoing renal surgery: a comparison of laparoendoscopic single-site (LESS), laparoscopic and open surgery. BJU Int 2012; 110(2): 268-72.
6. Awan M, Talpur AA, Jabeen F, Awan AH, Khaskheli NM. Mini cholecystectomy versus laproscopic cholecystectomy. Med Channel 2011; 17(2): 98-71.
7. Bogdanic B, Bosnjak Z, Budimir A, Augustin G, Milosevic M, Plecko V, et al. Surveillance of surgical site infection after cholecystectomy using the hospital in Europe link for infection control through surveillance protocol. Surg Infect (Larchmt) 2013; 14(3): 283-7.
8. Jayant M, Kaushik R. Presentation and management of gallbladder remnant after partial cholecystectomy. Trop Gastroenterol 2013; 34(2): 99-103.
9. Bhurgri MR, Muhammad SR, Rajput MJ. Laparoscopic cholecystectomy fate of spilled bile with gallstones during laproscopic cholecystectomy. Professional Med J 2011; 18(3): 361-5.
10. Simopoulos C, Polychronidis A, Botaitis S, Perente S, Pitiakoudis M. Laparoscopic cholecystectomy in obese patients. Obes Surg. 2005; 15(2): 243-6.
11. Strasberg SM, Hertl M, Soper NJ. An analysis of the problem of biliary injury during laparoscopic cholecystectomy. J Am Coll Surg 1995; 180(1): 101-125.
12. Shaikh R, Pohani RM, Ayub M, Asghar A, Malik KA, Rehman S. Bile duct injuries during open and Laproscopic Cholecystectomy: management and outcome. Pak J Med Sci 2009; 25(3): 496-9.
13. Vivek MK, Augustine AJ, Rao R. A comprehensive predictive scoring method for difficult laparoscopic cholecystectomy. J Min Access Surg 2014; 10: 62-7.