

Early Experience with Laparoscopic Excision of Choledochal Cyst

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1. Abstract

1.1. Background: Around the world, laparoscopic Roux-en-Y hepaticojejunostomy and choledochal cyst excision are well established procedure. However, in our hospital open choledochal cyst excision was being performed regularly, laparoscopic excision had started for the first time in 2019.

Objective: The aim of this research was to review the early experience of our unit in the laparoscopic choledochal cysts excision.

1.2. Methods: This retrospective study was carried out at General Surgery Department of Hayatabad Medical Complex Peshawar from April 2019 to April 2021. A total of 15 patients underwent laparoscopic choledochal cyst excision. Patients demographic, operative data and post-operative outcomes were recorded and analyzed.

1.3. Results: Total 15 patients were included in the study. Age ranged between 15-60 years with a mean age of 37.5 years. There were 1(6.7%) male and 14(93.3%) females with a male to female ratio of 0.07:1. Figure-i The most common presenting symptoms were abdominal pain 6(40%), vomiting 4(26.7%), fever 2(13.3%), acholic stool 2(13.3%) and 1(6.7%) with jaundice. All patients had successful excision of choledochal cysts laparoscopically. Mean time of operation was 180 minutes (range 120 min – 240 min). All patient had Type-1 choledochal cyst. All patients recovered uneventfully and were discharged between 3 and 5 days postoperatively. Average intraoperative blood loss was about 10ml (range 8-12 ml).

1.4. Conclusions: Laparoscopic Choledochal cyst excision is a safe procedure with the added advantage of magnified view with more precise dissection and anastomosis, less blood loss and less postoperative pain.

2. Introduction

Choledochal cyst is characterized by cystic dilatation of extra and intrahepatic bile ducts. Etiology of choledochal cyst is not clearly understood, but its association with an abnormal pancreatico biliary duct junction is well established. Vater originally characterized choledochal cysts in 1723 while Todani et al classified them in 1977.^{1,2} Choledochal cyst is more common in females than males and usually presents in childhood, however 20% of the choledochal cyst present in adult age.^{3,4} Although there are various classification the most common type is fusiform dilatation (Todani type-I) of the extra hepatic bile duct (78%).^{5,6} Abdominal pain, jaundice, cholangitis are among the common presenting symptoms. As choledochal cyst is considered a premalignant condition, excision as early as possible is the rule.⁷ The current standard treatment is complete excision of the cyst and hepaticojejunostomy.

The first laparoscopic choledochal cyst excision was performed by Farello et al in 1995.⁸ With the passage of time and advances in laparoscopic techniques, laparoscopic excision becomes the preferred method and is now being performed regularly all over the world.⁹ Laparoscopic choledochal cyst excision provides a number of benefits over open surgery, i.e. good visualization, quick recovery, less pain and avoidance of lengthy subcostal incision.

This study aims to demonstrate the feasibility of the procedure and effectiveness of choledochal cyst excision in our setup.

3. Materials and Methods

This retrospective study was carried out at General Surgery Department of Hayatabad Medical Complex from 1st April 2019 to 30th March 2021. Total 15 patients with choledochal cysts type I underwent laparoscopic excision. Patient demographics, operative data and post-operative outcomes were recorded and analyzed.

Approval was obtained from the institutional ethics committee.

Blood investigations included complete blood counts, liver function tests, renal function tests, international normalised ratio and serum markers for hepatitis B and C. Radiological investigations included ultrasound of the abdomen, magnetic resonance cholangiopancreatography (MRCP) and a chest X-ray. Endoscopic retrograde cholangiopancreatography (ERCP) was advised in patients with cholangitis and suspected diagnosis of common bile duct stone instead of choledochal cyst. Todani et al.'s classification system was used for disease stratification.

Patients were placed in reverse Trendelenburg's position, and operating surgeon was on the left side of the patient. Total four laparoscopic access ports were used. Dissection of hepatocystic triangle and division of cystic artery and cystic duct preceded dissection of cyst, however GB was left in place to be used for hepatic retraction.

Intrapancreatic part of the cyst was dissected carefully to avoid injury to pancreatic duct and distal end of CBD is either ligated intracorporally or closed with a hemolock clip. Cephalic part of CC was dissected and divided just below the formation of biliary confluence. Both right and left hepatic ducts were flushed with normal saline to clear intrahepatic bile duct stones and/or sludge.

Approximately 15 cm distal to duodenojejunal junction, a window was created in the jejunal mesentery and an Endo GIA™ stapler was used to divide the jejunum. Divided distal end of jejunum was brought up to supracolic compartment through a window in the transverse mesocoln. An enterotomy was made over the jejunum

to fashion a bilioenteric anastomosis with interrupted polyglactin 4/0 sutures.

Jejunojejunostomy was performed 70 cm distal to bilioenteric anastomotic site. Both the anastomotic sites were reinspected, and port sites was closed after placement of an abdominal drain (24 French) in the right sub hepatic space.

Data was analyzed using SPSS 23.0. Microsoft excel 2013 was also used for tables and figures/graphs.

4. Results

Total 15 patients were included in the study. Age ranged between 15-60 years with a mean age of 37.5 years. There were 1(6.7%) males and 14(93.3%) females with a male to female ratio of 0.07:1 (Figure 1).

The most common presenting symptoms were abdominal pain 6(40%), vomiting 4(26.7%), fever 2(13.3%), acholic stool 2(13.3%) and 1(6.7%) with jaundice (Figure 1).

All patients had successful excision of choledochal cysts laparoscopically. Mean time of operation was 180 minutes (range 120 min – 240 min). All patients recovered uneventfully and were discharged between 3 and 5 days postoperatively. Average intraoperative blood loss was about 10ml (range 8-12 ml).

No major post-operative complication like biliary leak / bleeding was noted in our study. Most common complication was vomiting and pain. In 1 patient who had pancreatitis pre operatively the pain persisted for a longer period of time. There was no mortality recorded in this study (Table 1).

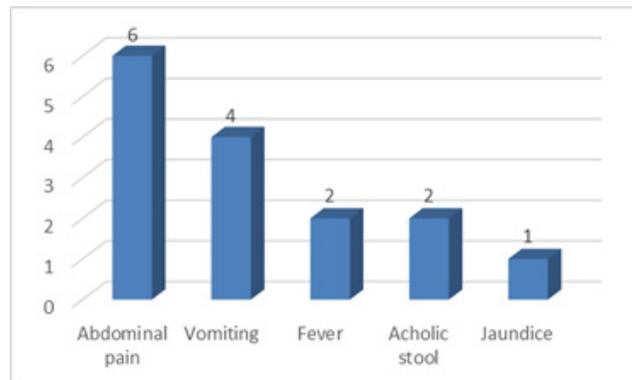


Figure 1: Common presenting symptom

Table 1: Postoperative Complications

| Complication | Frequency | Percentage |
|----------------------|-----------|------------|
| Bile leak / bleeding | 0 | 0% |
| Vomiting | 3 | 20% |
| Pain | 4 | 26.66% |
| Wound infection | 2 | 13% |

5. Discussion

Vater was the first to describe the choledochal cysts back in 1723.10 Although its genesis has been the subject of extensive research, the precise cause is still a mystery. The standard treatment of CC is complete excision of the cyst and reconstruction with Roux-en-Y hepaticojejunostomy. Laparoscopic choledochal cyst excision is becoming popular for most of the surgeons due to the rapid advancement of laparoscopic procedures in recent years [11].

A clear and magnified operating area, which may clearly display the hepatic artery, the portal vein, and all the minor veins surrounding the cyst, is a benefit of laparoscopic surgery. By doing so, you might lower risk of bleeding and prevent damage to these blood vessels and pancreas. In fact, this series had an average intraoperative blood loss of 10 ml [12, 13]. In addition, the laparoscopic procedure leads to a quick recovery, less post-operative pain, and a shorter stay in the hospital. Duration of surgery is prolonged initially (120-240 mins) but it has decreased as we gained experience and stabilized to just over two hours. Of course, one would not expect all surgeons to achieve this plateau after only few cases. Previous experience and proficiency in minimally invasive surgery would be a determining factor [14].

It was noted in this study that laparoscopic excision of CC in younger patient was easier due to the absence of adhesions and smaller cyst [15].

Furthermore, as most of the choledochal cysts are associated with a very narrow distal outlet, it is not uncommon for patients to be admitted with jaundice due to bile duct obstruction [16]. These patients can undergo excision of the cyst without drainage in the absence of cholangitis.

In order to have a good view of the operating field during surgery, the liver needs to be retracted by applying traction on the gall bladder. If you dissect the gall bladder early on it obscures the view and interferes with the dissection of the choledochal cyst. Due to this reason we mobilized the gall bladder at the end till the entire choledochal cyst was dissected free [17].

6. Conclusion

Our experience strongly suggests that laparoscopic choledochal cyst excision is a safe and effective procedure with many benefits to the patients, however it needs for the surgeon to be well versed with the laparoscopic procedures before starting choledochal cyst excision.

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