

Laparoscopic Cholecystectomy for a Patient with Double Gallbladder Duct: A Case Report

He Y¹, Dong BL¹, Chen SY², Wu B² and Yang XJ^{3*}

¹School of Clinical Medicine, Gansu University of Chinese Medicine, Lanzhou 730000, China

²School of Clinical Medicine, Ningxia Medical University, Yinchuan 750000, China

³Department of General Surgery, Gansu Provincial Hospital, Lanzhou 730000, China

Volume 3 Issue 3- 2020

Received Date: 16 Feb 2020

Accepted Date: 10 Mar 2020

Published Date: 16 Mar 2020

2. Key words

Laparoscopically; Cholecystectomy; Cholangiography

1. Abstract

Introduction: Duplicated cystic ducts with a single gallbladder are extremely rare. We summarize and analyze the diagnose and treatment process of one case of gallstone disease in a patient with doublecystic duct who successfully treated with laparoscopic cholecystectomy.

Presentation of case: A37-year-old female presented with signs and symptoms of acute cholecystitis . She was found to have an accessory cystic duct on laparoscopic cholecystectomy.

Discussion: For patients with gallbladder stones and bile duct malformation, it is required that the surgeon should have rich experience, carefully identify the anatomical structure of the biliary tract system. In the operation, cholangiography is feasible when the anatomic structure of biliary tract cannot be determined.

Conclusion: Although laparoscopic surgeon is mature, when the anatomical structure cannot be identified, the conversion to laparotomy should be had in time to avoid the occurrence of secondary injuries.

3. Introduction

Duplication of cystic duct is a rare variant, the variation increases risks of ductal injury, which requires surgeons to be familiar with bile duct variation, carefully identify the anatomy of the bile duct, and to prevent bile leakage [1]. Or else, there will need for open conversion and will produce postoperative complication. One case of laparoscopic cholecystectomy for a patient with double gallbladder duct is reported as follows.

Patient information

A 33-year-old married female, who presented to our hospital with intermittent right upper abdominal pain and discomfort for more than 5 years, aggravating for 3days.The pain started suddenly, sharp in character, radiating to right shoulder and epigastric area, associated with nausea and poor appetite. Past surgical and medical histories were negative.

Clinical Findings

The patient was in pain. Murphy's sign was positive and right upper quadrant was tender without peritoneal signs.

3.3. Diagnostic Assessment

Vital signs, blood examination, electrocardiography and echocardiography were within normal range. Abdominal ultrasound showed multiple gallbladder stones with gallbladder atrophy, largest one about 10 millimeters in diameter.

3.4. Laparoscopic Surgeon

After the preoperative examination was fully completed, contraindications were excluded and laparoscopic cholecystectomy was performed under general anesthesia. When the cystic duct and artery were dissected free from the cystic triangle laparoscopically, double cystic duct was found (Figure 1A), clipped, gall bladder removed. Finally, it was confirmed that the main gallbladder duct was from the common bile duct and the secondary gallbladder duct was from the right hepatic duct (Figure 1B) and there were multiple gall stones (Figure 2). Histopathological examination showed a feature of cholecystolithiasis with chronic cholecystitis.

4.5. Follow-Up and Outcomes

Two weeks later, the patient was stable and no discomfort.

*Corresponding Author (s): Xiao-Jun Yang, Department of General Surgery, Gansu Provincial Hospital, No. 204 Donggang West Road, Lanzhou 730000, Gansu Province, China, E-mail: yangxjmd@aliyun.com

<http://acmcasereports.com/>

Citation: Yang XJ, Laparoscopic Cholecystectomy for a Patient with Double Gallbladder Duct: A Case Report. Annals of Clinical and Medical Case Reports. 2020; 3(3): 1-4.

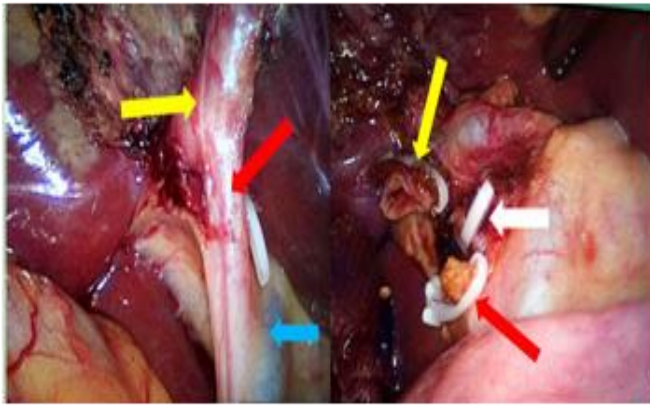


Figure 1: Intraoperative finding of double cystic duct.



Figure 2: Multiple stones evacuated from the gallbladder.

5. Discussion

The incidence of double cystic duct variation was 0.025% [2]. At the 4th week of human embryo development, The caudal branches of the diverticulum elongate, the distal end dilates to form the gallbladder, and the proximal end narrows to form the gallbladder duct. If the diverticulum diverges into two caudal branches, which will cause the occurrence of double gallbladder or double cystic duct variation. In this case, if only one of the double cystic duct is ligated, bile leakage will inevitably result in the failure of the operation. If the ligation is cut close to the wall of the gallbladder, the remaining cystic duct will be longer, which may cause the so-called "small gallbladder" after the operation [3]. The study of bile duct anomalies began with Edward Boyden in 1926. Thirty years later, Caster and Flannery categorized cystic duct duplication into 3 types: (1) "Y" type, wherein 2 cystic ducts join to form a single cystic duct that then enters the common bile duct, (2) "H" type, in which each cystic duct independently joins the bile duct system at the common bile duct, right hepatic duct, left hepatic duct or common hepatic duct, and (3) trabecular type, in which one cystic duct enters the common bile duct while the other directly enters the liver parenchyma [4]. The double cystic duct in this case is of type "Y". The surgical plan is determined according to the variation [5]. The treatment of extrahepatic biliary tract variation is usually surgery [6]. Laparoscopic surgery is feasible in the prevention and

repair of biliary tract injury [7].

Double cystic duct malformation generally is found by accident without specific symptoms. The incidence of the disease is very low, preoperative diagnosis is difficult. In the actual clinical work, preoperative Magnetic Resonance Cholangio Pancreatography (MRCP) is no need [8]. However, MRCP can display various mutations [9], MRCP for bile duct variation has a high degree of sensitivity and specificity, the diagnosis of bile duct sensitivity was 66% [10], higher than that of CT and ultrasound examination. Significantly MRCP can evaluate bile duct shape, direction, size and site comprehensively without contrast agent [11]. Hence, MRCP become the gold standard for preoperative diagnosis of double cystic duct abnormalities. MRCP before LC can help prevent biliary damage and avoid misdiagnosing choledocholithiasis, so as to optimize the surgical plan and reduce the postoperative risks [12]. Of course, the final diagnosis depends on intraoperative confirmation.

Cystic duct malformation will increase the incidence of iatrogenic biliary tract injury. Studies have found that LC combined with cholangiography can avoid the possible bile duct injury [4,13], because intraoperative cholangiography can develop the whole bile tree, which can not only show the filling defect caused by stones, but also find the anatomical abnormality of the biliary tract [14]. Intraoperative application of choledochoscopy can directly observe the lesions of intrahepatic and extrahepatic bile ducts, which can be treated by choledochoscopy, reducing the reoperation rate and postoperative residual stone rate [15]. LC combined with ERCP can help obtain the entire biliary system anatomy and avoid unnecessary loss [12]. ERCP can remove the stones in the common bile duct, but the effect of stones in the gallbladder is poor. Endoscopic Sphincterotomy (EST), which disrupts antireflux function and causes intestinal contents to flow back into the biliary system, is a potential factor of postoperative biliary tract infection. About 5% of patients may also be induced in Pancreatitis, suffering greater pain. Therefore, for patients undergoing surgery with endoscopic treatment, its indications should be strictly mastered [13]. (Table 1) shows literature review of the reported cases of Double cystic duct.

6. Conclusion

In summary, careful dissection of the gallbladder triangle will become the key to prevent biliary tract injury. In the operation, cholangiography is feasible when the anatomic structure of biliary tract cannot be determined [1]. Although laparoscopic surgeon is mature, when the anatomical structure cannot be identified, the conversion to laparotomy should be had in time to avoid the occurrence of secondary injuries.

Table 1: Literature review of the reported cases of Doublecyst

1. Heyas et al	1931	35. male	Preoperative CRE	double	Not mentioned
2. Kennon	1933	69. male	Second re-exploration	double	suppurative cholecystitis
3. Wilson	1939	55. female	intraoperative	double	Acute cholecystitis
4.Paraskevas et al	1989	76. female	Postmortem	Single	Post morter me duc ation al examination
5.Perelman	1961	56.Female	Intraoperative	Single	Chronic cholecystitis
6.Senapatiet al	1984	55.Female	intraoperative	single	Chronic cholecystitis
7.Nakasugi et al	1995	50. female	Preoperative ERCP	Single	Chronic cholecystitis
8. Ng et al	1996	60.Male	Postmortem	Single	Chronic cholecystitis
9.Momiyama et al	1996	66.Female	Intraoperative	Single	Chronic cholecystitis
10. Hirono et al	1997	74. female	PreoperativeUS, CT-scan	single	Chronic cholecystitis
11.Fujikawa et al	1998	70. female	Intraoperative	single	Chronic cholecystitis
12.Tsutsumi et al	2000	74. Female	Preoperative ERCP	Single	Chronic cholecystitis
13.Lobo et al	2000	49.Female	Intraoperative	Single	Chronic cholecystitis
14.Shivhare et al	2002	46. female	intraoperative	single	Chronic cholecystitis
15. Huston et al.	2008	43. female	intraoperative	single	Chronic cholecystitis
16.Yoo et al.	2008	55. female	Preoperative MRI, PTBD	single	CBD cancer
17. Vicente et al.	2009	newborn	Intraoperative	singe	acute cholecystitis
18.Aristotle et al	2011	50. Male	Postmortem	Single	Chronic cholecystitis
19.Shih et al	2011	37. Male	Intraoperative	single	Chronic cholecystitis
20. Grkem et al.	2014	10. Male	Preoperative US	Double	acute cholecystitis
21.Shabanali et al	2014	50.Female	Intraoperative	single	Chronic cholecystitis
22. Otaibi et al.	2015	54. male	intraoperative	single	Chronic cholecystitis
23.samnani et al	2015	43. female	intraoperative	single	Chronic cholecystitis
24.Wei et al	2015	66. Female	Preoperative US, CT-scan	Double	Chronic cholecystitis
25.Fujii et al	2017	57. Female	Preoperative ERCP	Single	Chronic cholecystitis
26.Salih et al	2017	33. Female	Intraoperative	Single	Chronic cholecystitis
27.Abdulwahid M. Sali	2017	33.Female	Intraoperative	Single	Chronic cholecystitis
28.Semeret Munie	2019	34. Female	Intraoperative	Single	Chronic cholecystitis
29.Present case	2019	37.Female	Intraoperative	Single	Chronic cholecystitis

Reference

1. Bao-qiang Wu, Yong Jiang. A case of laparoscopic cholecystectomy for bilateral cystic duct malocclusi. Chinese journal of general practitioners. 2014; 13(2): 156-157. DOI: 10.3760/cma.j.isn.1671-7368.2014.02.031.
2. Jian-min Wang. A case of double cystic duct with ectopic opening. Journal of clinical surgery. 2001; 9(1): 22. DOI: 10.3969/j.issn.1005-6483.2001.01.040.
3. Zhi-kuan Fang, Hong-sheng LI. A case of double cystic duct variation. New medicine, 1984; 2: 28.
4. Samnani SS, Ali a. "Y" variant of double cystic duct: incidental finding during laparoscopic cholecystectomy. Journal of Indian J Surg. 2015; 77(3): S1491. DOI: 10.1007/s12262-014-1066-x.
5. Hai MA,Guang-hui Zhang. A case of cystic duct malformation with calculi. Journal of community medicine. 2010; 8(9): 86.
6. Salih, AM Kakamad FH, Mohammed SH, et al. The Double cystic

- duct, a review of literature with the report of a new case. *Int J Surg case Rep.* 2017; 38: 146-148. The DOI: 10.1016/j.j. JSCR. 2017.07.027.
7. Bing-yi Wang, Yufeng Wang, Shuai-Xiao, et al. Laparoscopic repair of biliary tract injury during biliary tract variation. *Journal of hepatobiliary and pancreatic surgery.* 2018; 30(3): 234-237. DOI: 10.11952/j.issn.1007-1954.2018.03.013.
 8. Xiao-hui Liu, Gui-liang LI, Wen-zhou Song. Double cystic duct variation in 1 case. *Journal of regional neurosurgery.* 2005; 14(5): 295. DOI: 10.3969/j.issn.1672-5042.2005.05.041.
 9. Lei Zhang, Ya-Ying Yang, Li Zhang. *Journal of kunming medical university.* 2018; 39(6): 109-112. DOI: 10.3969/j.issn.1003-4706.2018.06.023.
 10. Fujii A, Hiraki M, Egawa N, et al. The Double cystic duct preoperatively diagnosed and successfully treated with laparoscopic cholecystectomy: A case report. *Int J Surg case Rep.* 2017; 37: 102-105 DOI: 10.1016/j.j. JSCR. 2017.06.013.
 11. Qi Li, Shuang Dong, Ming-cheng Hu, et al. Clinical value of magnetic resonance cholangiopancreatography in the evaluation of bile duct variation. *Modern Chinese doctor.* 2018; 56(9): 124-126,129,169.
 12. Xi-ping Liu, Jun Zhou, Teng-long Tang, et al. Analysis of 30 cases of laparoscopic cholecystectomy combined with ERCP to solve intractable intraoperative problems. *Chinese journal of general surgery.* 2015; 24(2): 293-296. DOI: 10.3978/j.issn.1005-6947.2015.02.028.
 13. Xi-zhang SUN, Feng MEI. A comparative study on the efficacy of double-mirror combined cholecystectomy and laparotomy in the treatment of extrahepatic bile duct stones. *World's latest medical information digest,* 2018, 18(A2): 8-9; 11.
 14. Ji-dong WANG. Clinical analysis of 125 cases of intraoperative cholecystocholangiography. *Journal of continuing physicians.* 2001; 24(3): 23-24. DOI: 10.3760/cma.j.issn.1673-4904.2001.03.012.
 15. Zhi-heng Fang, An-qing Zhang, Yafeng Hou. Discussion on the application value of choledochoscopy in biliary exploration. *Chinese journal of further study of physicians.* 2006; 29(5): 50-51. DOI: 10.3760/cma.j.issn.1673-4904.2006.05.019.