IOSR Journal of Dental and Medical Sciences (IOSR-JDMS)
e-ISSN: 2279-0853, p-ISSN: 2279-0861.Volume 21, Issue 2 Ser.5 (February. 2022), PP 13-15
www.iosrjournals.org

Laparoscopic subtotal cholecystectomy due to "difficult gallbladder" in a 50-year-old male: A case report

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Abstract
Background: *A successful cholecystectomy is characterised by the correct identification and closure of the cystic duct. When inflammatory changes obscure the anatomy, achieving this closure is difficult. Subtotal cholecystectomy allows for near-complete gallbladder removal and complete evacuation of the stones while avoiding dangerous dissection.*
Case presentation: *A 50-year-old male with acute cholecystitis, scheduled for emergency laparoscopic cholecystectomy. The dissection was impossible during the surgery visualising the Calot's triangle due to adhesions. A decision to remain laparoscopic and proceed to a laparoscopic subtotal cholecystectomy was made.*
Conclusion: *When the cystic duct cannot be safely identified, laparoscopic subtotal cholecystectomy is an effective surgical technique for avoiding bile duct injury. In these complex cases, subtotal cholecystectomy has acceptable morbidity and eliminates the need for conversion.*
Keywords: *Acute cholecystitis; Laparoscopic subtotal cholecystectomy; Laparoscopic partial cholecystectomy; Difficult cholecystectomy; Difficult gallbladder.*

Date of Submission: 29-01-2022 Date of Acceptance: 10-02-2022

I. Introduction

Laparoscopic cholecystectomy has been established in general surgery as the treatment of choice for patients with gallstones and polyps. It is a safe and effective procedure with low morbidity and mortality [1]. The surgeon performing a laparoscopic cholecystectomy can face complicated situations such as Mirizzi syndrome, severe cholecystitis and liver cirrhosis. These situations can result in inadequate identification and vision of the anatomical structures, resulting in a higher surgical risk with the possibility of injuring the biliary duct [2].

In these cases, you have three options: convert the procedure to an open cholecystectomy, cholocystostomy or subtotal cholecystectomy [3]. The conversion to open cholecystectomy can solve the same surgical time. However, it does not guarantee that the anatomical structures are properly identified and therefore does not exclude a bile duct injury. Cholocystostomy can be performed laparoscopically; however, the patient must undergo another surgical procedure. Subtotal cholecystectomy has the advantage and benefits of minimally invasive surgery. It solves the problem simultaneously, making the appropriate procedure for complex cases when the critical view of safety cannot be obtained during the dissection of Calot's triangle [4].

This case report presents a case in which subtotal cholecystectomy was performed.

II. Case presentation

A 50-year-old male visited the emergency department with a two-day history of epigastric pain. The pain was sudden, sharp, located at the right upper quadrant, spread towards his right shoulder, and associated with nausea, vomiting, and fevers (37.8 oC). A month ago, the patient reported admission to another hospital due to acute cholecystitis. Body temperature was 37.6 oC, respiratory rate 16/min, and heart rate 95 beats/min. Blood pressure was 125/85 mmHg, and the ECG revealed a normal sinus rhythm. Physical examination revealed a positive Murphy's sign and rigidity in the right upper quadrant.

Laboratory studies revealed elevated white blood cells (white blood cell count 17.1 K/Ul), neutrophils (93%), C—reactive protein (105 mg/l). The Covid-19 test was negative, and the liver function tests were within normal limits. Abdominal ultrasound showed multiple gallstones, thickening of the gallbladder wall (5 mm), increased blood flow in the gallbladder wall, pericholecystic fluid, and sonographic Murphy's sign.

The patient was scheduled for emergency laparoscopic cholecystectomy. Intraoperatively, adhesions were noted between the gallbladder, omentum, and duodenum. Dissection started with exposure of the gallbladder by lysis of the adhesions. An attempt to dissect the area of the Calot triangle was made. However, the dissection seemed hazardous, and the gallbladder wall was noted to be friable. Visualizing the Calot triangle was impossible; thus, safe dissection was not feasible. A decision to remain laparoscopic and carry out a laparoscopic subtotal cholecystectomy was made. The procedure included opening the Hartmann's pouch, aspiration of bile, and removal of stones into a collecting bag. Circumferential transection of the gallbladder neck was completed using a stapler after identifying the cystic duct from inside. The gallbladder fundus was then excised, and the procedure was completed by securing hemostasis, leaving a drain in the infra hepatic fossa, and removing the collecting bag.

The patient recovered uneventfully, and the drain was removed on the sixth postoperative day. Eventually, the patient was discharged on the eighth postoperative day. At a one-year follow-up, he is doing well with no reported abdominal pain or postoperative complications.

III. Discussion

Laparoscopy is the standard procedure for gallbladder removal [1]. A difficult gallbladder is a common reason for converting to open surgery when the risk of injury is high due to limited exposure [2]. Conversion to an open procedure, on the other hand, does not always improve exposure, especially in obese patients, where the same anatomical challenges may persist [4].

The Laparoscopic Cholecystectomy (LC) rate has increased steadily in recent years (71,9% in 2003 to 86% in 2014). Laparoscopic Subtotal Cholecystectomy (LSCT) rates also increased from 0,12% to 0,28% [5].

According to the literature, severe cholecystitis occurs in about 10–15% of all cases of acute calculous cholecystitis [6]. The severity of the disease, the presence of adhesions resulting from the anatomical modification, the surgeon's laparoscopic experience, and the equipment available for surgical intervention are the main grounds for classifying a cholecystectomy as complex [7]. Severe inflammation of Calot's triangle leads to fibrosis and modifications to all anatomic landmarks, leading to iatrogenic injury of the hepatic duct, the common bile duct and the cystic duct. The severity of acute cholecystitis is associated with an increased risk of bile duct injury (BDI), according to the Tokyo 2018 guidelines. BDI is associated with increased hospital costs and mortality rates [8].

The first description of Subtotal Cholecystectomy was during open surgery when the identification of the biliary anatomy was difficult. In this procedure, a small gallbladder remnant is left, and Calot's triangle structures are prevented [9]. Furthermore, Elshaer found that patients who had laparoscopic subtotal cholecystectomy had a lower risk of subhepatic collections, retained stones, wound infections, reoperations, and mortality than open subtotal cholecystectomy [3]. As a result, laparoscopic subtotal cholecystectomy can avoid the need for an open procedure, which comes with its own set of complications and the risk of dangerous dissection [10]. The cystic duct remnant is usually closed with clips, sutures, or staples during a laparoscopic subtotal cholecystectomy. Michalowski et al. found no differences in the complication rate between patients who had a subtotal cholecystectomy with gallbladder remnant closure and those who had a subtotal cholecystectomy without closure [110]. Opponents of subtotal cholecystectomy may argue that patients who have the procedure have a higher risk of biliary complications afterwards, such as post-cholecystectomy syndrome, cholecystitis, or cholangitis [11].

IV. Conclusion

Whenever it's impossible to safely dissect and identify the structures in the Calot's triangle, laparoscopic subtotal cholecystectomy is an effective surgical technique for avoiding biliary and vascular injuries. In these complex cases, laparoscopic subtotal cholecystectomy achieves the procedure's aim with acceptable morbidity and mortality, obviating the need for conversion.

Acknowledgements: None.
Financial Support / Funding: This research did not receive any specific grant from funding agencies in the public, commercial, or not-for-profit sectors.
Disclosure statement: The authors report no conflict of interest.
Consent for publication: Written informed consent was obtained from the patient prior to publication.
Ethical approval: Not required.
Author contribution:

1. Stefanou SK: Study conception and design, drafting of manuscript.
2. Tepelenis N: Study conception and design, drafting of manuscript.
3. Tepelenis K: Literature search and acquisition of data.
4. Stefanou CK: Literature search and acquisition of data.
5. Flindris S: Analysis and interpretation of data.
6. TsoumanisP: Analysis and interpretation of data.
7. TsoumanisD: Critical revision.
8. Ntalapa KM: Critical revision.
9. Paxinos AK: Final approval of the version to be submitted.

All the authors agreed to be accountable for all aspects of the work in ensuring that questions related to the accuracy or integrity of any part of the work are appropriately investigated and resolved.

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Christos K. Stefanou MD, MSc, et. al. " Laparoscopic subtotal cholecystectomy due to "difficult gallbladder" in a 50-year-old male: A case report." *IOSR Journal of Dental and Medical Sciences (IOSR-JDMS)*, 21(02), 2022, pp. 13-15.