

## CASE REPORT

# A Rare Case of Biliary Leakage After Laparoscopic Cholecystectomy—Diagnostic Evaluation and Nonsurgical Treatment: a Case Report

Zlatan Mehmedovic<sup>1</sup>, Majda Mehmedovic<sup>2</sup>, Jasmin Hasanovic<sup>3</sup>

<sup>1</sup> Department of General Abdominal Surgery, Clinic for Surgery, University Clinical Center Tuzla, Tuzla, Bosnia and Herzegovina

<sup>2</sup> Department of Gastroenterology and Hepatology, Clinic for Internal Diseases, University Clinical Center Tuzla, Tuzla, Bosnia and Herzegovina

<sup>3</sup> Department of Hepatobiliarypancreatic Surgery, Clinic for Surgery, University Clinical Center Tuzla, Tuzla, Bosnia and Herzegovina

Corresponding author: Zlatan Mehmedović, MD. University Clinical Center Tuzla, Clinic for Surgery. Department of General Abdominal Surgery. Trnovac bb. Tuzla 75 000, Bosnia and Herzegovina. +387 61 289705. E-mail: zmehmedovic@hotmail.com

## ABSTRACT

Although laparoscopic cholecystectomy has become a gold standard in treatment of symptomatic cholelithiasis, it is associated with higher risk of intraoperative lesions and primarily lesions of biliary ducts. In small percentage of cases biliary fistulas occur, most commonly after leakage from cystic duct stump or accessory bile ducts – Luschka's duct. We report of a patient who had episodes of abdominal pain following routine laparoscopic cholecystectomy for acute calculous gallbladder. Results of conducted diagnostics verify the presence of biliary fistula caused by obstruction of bile pathways by stagnant pus and microcalculi of common bile duct, with development of biloma presumably caused by pressure injection of contrast material during ERCP procedure. Endoscopic sphincterectomy via ERCP enabled healing of formed biliary fistula, whilst continuous percutaneous ultrasound guided drainage of biloma was method of choice in later treatment of our patient. It is important to note that diagnostic evaluation of biliary fistula is very challenging and that timely nonsurgical treatment is of great benefit for patient.

**Key words:** bile leakage, biloma, laparoscopic cholecystectomy, percutaneous drainage, endoscopic sphincterectomy

## 1. INTRODUCTION

Last several decades laparoscopic cholecystectomy has become a gold standard in treatment of symptomatic cholelithiasis, even in patients with acute cholecystitis (1, 2, 3, 4). Patients who undergo laparoscopic treatment recover faster, have easier postoperative course and earlier discharge from hospital (2).

However, laparoscopic cholecystectomy is associated with higher risk of intraoperative lesions, primarily lesions of biliary ducts, intestines and vascular structures (2). Studies report of incidence of biliary fistulas after laparoscopic cholecystectomy 1,1 – 4% (5, 6) most commonly after leakage from cystic duct stump or accessory biliary duct – Luschka's duct (7, 8). Biliary fistulas can also be caused by unintentional lesion of common bile duct (CBD) or hepatic biliary duct caused by T drainage, overly used cauterization or laser in region of CBD (9).

Causes of biliary fistulas can also be explained by unexperienced surgeon, poorly identified anatomical structures, unsuccessful clipping of cystic duct stump or thermal lesions of bile ducts (2, 7).

Regardless of nature of lesions, most biliary fistulas are not evident or recognized during surgery and most patients present themselves with symptoms and signs of abdominal pain, bile in abdominal drainage content, biliary peritonitis or intra-abdominal sepsis (2, 10, 11).

Ultrasonography (US) and computed tomography (CT)

cannot reliably distinguish bile from other postoperative intra-abdominal fluid collections. Magnetic resonance (MRI) imaging with hepatobiliary agents and MRI cholangiopancreatography provide anatomic and functional information that allows for prompt diagnosis and excludes any other concomitant complications (8).

Early identification and endoscopic intervention with sphincterotomy and/or biliary stent placement is accepted as an effective way of managing biliary leaks, in that it decompresses the biliary system and allows healing of the damaged or leaking duct (2). We report a case of post-cholecystectomy bile leakage in a 51-year-old male who presented with persistent dull abdominal pain after the laparoscopic cholecystectomy.

## 2. CASE PRESENTATION

Caucasian male patient aged 51 years was admitted to Clinic for Surgery of University Clinical Center Tuzla for elective surgery of calculous gallbladder. During surgery gallbladder empyema with microcalculosis was identified. Surgery and postoperative course went without complications. During hospitalization patient was treated with infusions and antibiotics. Third day post-surgery patient has no health complaints, an ultrasound check-up was performed and after no free abdominal fluid was identified, abdominal drainage catheter was removed. Patient was discharged with recommendations for antibiotic treatment.

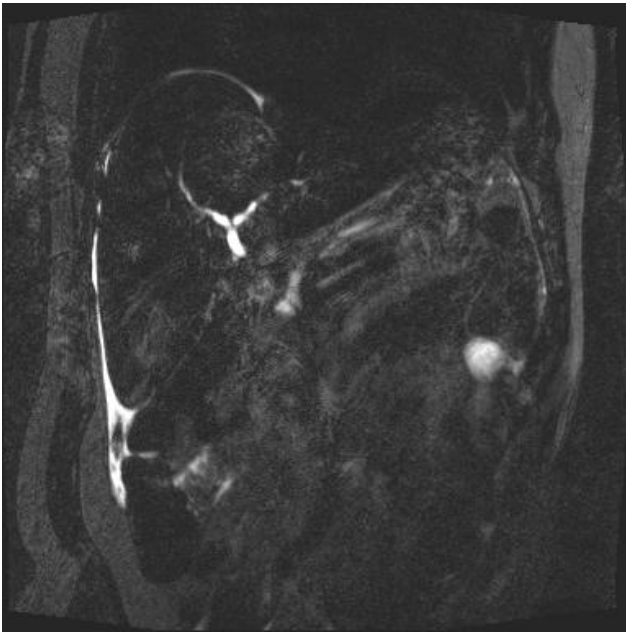


Figure 1. Postoperative/post-inflammatory changes of extrahepatic bile ducts, whilst bile ducts are not dilatated. Both right and left hepatic ducts as well as common hepatic duct are seen. Lamellar forms of free fluid are seen in perihepatic and subhepatic region (MR).

Eight day post-surgery patient is referred to Clinic for Surgery because of severe epigastric, left rib cage and left periumbilical pain. On admission laboratory tests were performed which showed slightly elevated values of total bilirubin (30  $\mu\text{mol/L}$ ), C-reactive protein (14 mg/L) and liver transaminase (AST=50 U/L; ALT=113 U/L). Patient was admitted to Department of Abdominal Surgery, and urgent computed tomography (CT) scan was performed which identified minor fluid collection by front hepatic margin.

In the course of next few days ultrasound check-up was done and no progression in size of CT-identified abdominal fluid was recorded. Patient complained of intermittent attacks of pain followed by periods without pain. Increase in body temperature of 38 degrees Celsius was noted during nighttime.

Furthermore magnetic resonance cholangiopancreatography (MRCP) was performed which concluded of postoperative/post-inflammatory changes of extrahepatic bile ducts with no significant dilatation, but with dense bile and punctiform calculi intraluminally. MRCP also described lamellar forms of free abdominal fluid in region of removed gallbladder bed [Figures 1, 2, 3]. Gastroenterologist was consulted and endoscopic ultrasound (EUS) was performed which concluded of microcholedocholithiasis, cholangitis and possible interstitial pancreatitis. Endoscopic retrograde cholangiopancreatography (ERCP) was performed; after injection of contrast microcalculosis of common bile duct and detritus of pus intraluminally were identified [Figure 4]. Sphincterectomy was performed during endoscopic intervention. After ERCP elevation of values of pancreatic amylases and lipases in a sense of post-ERCP pancreatitis was seen in laboratory findings of patient (serum amylases= 317 U/L; urine amylases=3764 U/L; lipase=2129 U/L).

Check-up laboratory findings showed progressive elevation of white blood cells count ( $15,9 \times 10^9/\text{L}$ ), C-reactive protein (217 mg/L), total bilirubin (59  $\mu\text{mol/L}$ ), liver transaminases

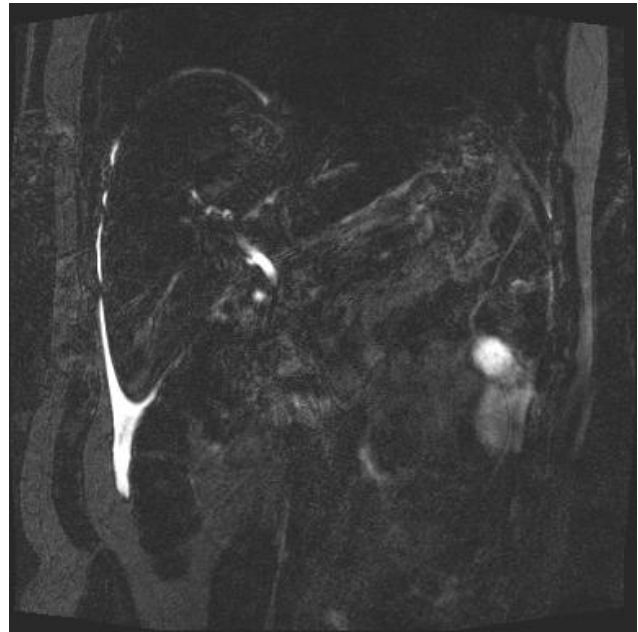


Figure 2. Common hepatic duct with lamellar forms of free abdominal fluid in perihepatic and subhepatic region (MR).

(AST= 83 U/L; ALT=92 U/L) and alkaline phosphatase (273 U/L). Control ultrasound examination found large abdominal fluid collection. Computed tomography (CT) scan with contrast was performed and fluid collection in projection of left lobe of liver and bursae omentalis is seen with characteristics of possibly inflamed lesion. Peripancreatic exudate was seen as well [Figure 5].

Taking into account significant progression in size of intra-abdominal fluid collection after ERCP was performed, patient was transferred to Department of Gastroenterology and Hepatology of Clinic for Internal Diseases where percutaneous drainage of fluid collection was about to be performed. Gastroenterologist performed ultrasound-guided percutaneous drainage of above-mentioned peripancreatic fluid col-

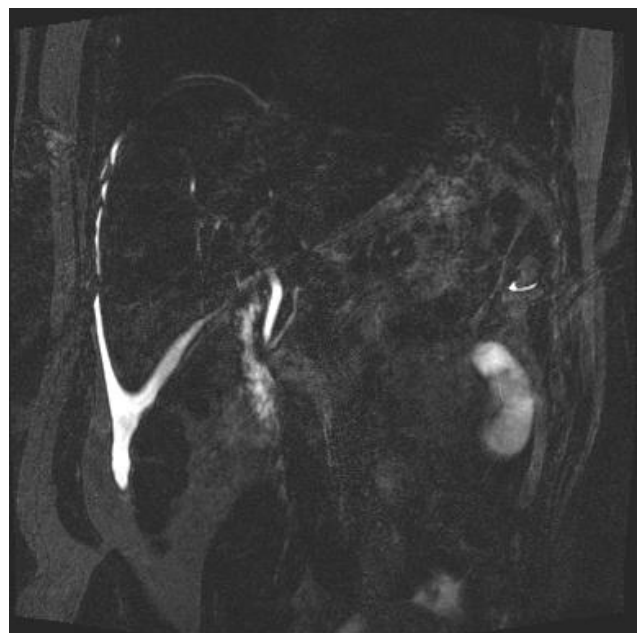


Figure 3. Common bile duct and passage of contrast via papilla Vateri. Pancreatic duct is of normal width. Lamellar forms of free abdominal fluid can be seen in peri- and subhepatic region (MR).



Figure 4. Radiographic finding during ERCP intervention. Common bile duct is within normal width of lumen with calculus of approx. 15 mm in projection of bifurcation of ductus hepaticus communis. Visible intrahepatic bile ducts are of normal width of lumen. During procedure patient was erected into stand-up position and radioscopy confirms normal elimination of contrast out of bile ducts and pancreatic duct with no signs of elimination of calculus (X-ray radioscopy).



Figure 5. Pseudocystic lesion of left lobe of liver and bursae omentalis, with characteristics of inflamed lesion, although inclusions of air are present within cystic formation, which would conclude od abscess collection (CT).

lection. Catheter of 8Fr was guided into collection by which around 1 liter of liquid that seemed like stagnant bile was obtained. Material was analyzed for inflammatory response parameters, amylase, bilirubin and microbiology.

No pathogenic bacteria were isolated from collected material. Material was positive for bilirubin which proved that the fluid collection was biliary fluid originating from biliary fistula. Catheter drainage was continued for several consecutive days in which patient's general condition improved. Percutaneous drainage catheter was removed after seven days of drainage and after no more biliary content was drained. Ultrasound examination showed no fluid collections and no free

abdominal fluid. Patient was pain-free, afebrile, and parameters of inflammatory reaction in control laboratory findings were decreasing to normal values. No indications for repeated ERCP were concluded.

Thirty days after laparoscopic cholecystectomy was performed patient was discharged from hospital with recommendations for follow-up examinations in two weeks time. On his follow-up examination patient presents without health complaints, with all laboratory findings within their normal values, and with normal ultrasonographic finding of intra-abdominal organs.

### 3. DISCUSSION

Bile leakage after laparoscopic cholecystectomy accounting for 0.2%-2% may cause intra-abdominal collection, fistula formation or life threatening bile peritonitis in case of large amounts. It usually comes from the cystic duct stump due to misplacement of the clips, common bile duct injury and from accessory duct or small bile ducts of gallbladder bed, i.e. Luschka's duct. Diagnosis and treatment of bile leak from an aberrant bile duct may be delayed (12).

In our case migration of pus and microcalculi out of acutely inflamed gallbladder into extrahepatic bile ducts after laparoscopic surgery had most likely led to increase of intraluminal pressure in extrahepatic bile ducts causing obstacles in biliary drainage with formation of delayed biliary fistula in days following surgery. Due to impassable bile ducts the biliary content leaked from cystic duct stump or accessory bile ducts in minor quantities, causing intra-abdominal pains which were reflection of peritoneal irritation by biliary content. Increased serum bilirubin and inflammatory parameters were reactive to leaking free biliary content in intra-abdominal spaces.

Ultrasonography (US) and computed tomography (CT) cannot reliably distinguish bile from other postoperative fluid collections. Magnetic resonance (MRI) imaging with hepatobiliary agents and MRI cholangiopancreatography provide anatomic and functional information that allows for prompt diagnosis and excludes any other concomitant complications (8).

Endoscopic retrograde cholangiopancreatography (ERCP) with sphincterotomy and/or biliary stent placement has become the primary modality for treatment and effectively manages most bile duct leaks (2, 6, 9).

The primary goal of endoscopic therapy is to reduce the transpapillary pressure gradient. Consequently, transpapillary flow is improved, and the extravasation out of the bile duct leakage is reduced. In addition to decompressing the biliary system, stent implantation closes the defect and works as a bridge at the site of extravasation. Endoscopic therapy consists of biliary sphincterotomy alone, placement of a biliary stent, or nasobiliary drainage, as well as a combination of these approaches (13).

On the other hand, high pressure in the proximal biliary ducts, caused by injection of contrast material, is the reported cause of a biloma after ERCP (14).

Considering our patient, after contrast was injected under pressure into biliary pathways during ERCP, the leakage of biliary content into intra-abdominal spaces was increased and large peripancreatic fluid collection – biloma was formed.

Biloma can be drained percutaneously with removal of the

drainage catheter when the output is minimal (14).

When endoscopic sphincterectomy via ERCP was performed the pressure in biliary ducts was lowered and the site of biliary fistula was able to heal. However, biloma was still present and percutaneous drainage of intra-abdominal biliary collection was salutary intervention.

Among interventions that we did not provide, and which were described in medical literature, were nasobiliary drains. They have proved to be effective and do not require an endoscopy for removal. Limitations include accidental tube removal and general patient acceptability, resulting in many centers abandoning them altogether (15).

#### 4. CONCLUSION

This case presentation is to emphasize importance of correct diagnostic evaluation and timely and adequate non-surgical methods of treatment of biliary fistulas.

**CONFLICT OF INTEREST: NONE DECLARED.**

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