



Bilioma after cholecystectomy in a young patient: A case report



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ABSTRACT

Introduction: Gallstones are not uncommon, with a prevalence of approximately 10% in the general population and are twice as likely to develop in women. Bile duct injuries (BDIs) after cholecystectomy remain a feared complication. The incidence of BDIs after open cholecystectomy is 0.1% to 0.2% and is 0 to 1% for laparoscopic cholecystectomy. Biliomas are encapsulated intra- or extrahepatic collections of bile fluid caused by an injury to the bile duct resulting in bile leaks. Successful treatment of bile duct injuries depends on multiple factors, such as early identification, evaluation, timing of intervention, chosen procedure, experience of the center, and overall condition of the patient. **Discussion:** Bile duct injuries (BDIs) that occur after cholecystectomy are an iatrogenic catastrophe that requires a multidisciplinary approach for optimal treatment. As reported in the case presented above, the patient had a cystic duct injury due to iatrogenic cholecystectomy surgery. Interventional biloma drainage approaches, including ERC, PTCD, CT or ultrasound-guided puncture (SGP), and rendezvous intervention appear to be safe and effective. **Conclusion:** The incidence of bile duct injuries is very low, i.e., it is considered a rare case. Biliomas occur after an injury to the ducts, where the key to successful treatment lies in early identification of the problem and referral to the operating room for a better approach, where the main goal of repair is to achieve adequate biliary drainage.

Keywords: Bilioma, Cholecystectomy, Bile Duct Lesions.

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INTRODUCTION

Gallstones are not uncommon, with a prevalence of approximately 10% in the general population and twice as likely to develop in women (2020. YU et al., 2020). They are formed primarily in the gallbladder, less frequently in the intrahepatic or extrahepatic bile ducts (ZDANOWICZ et al., 2022). Cholelithiasis (gallstone disease) affects about 10% to 20% of adults worldwide, and can be categorized into two types, including cholesterol and pigmented gallstones. Pigmentary stones are mainly observed in hemolytic diseases, and their incidence remains stable, and result from abnormal bilirubin metabolism. Cholesterol gallstones are caused by genetic and environmental factors that lead to an elevated concentration of cholesterol in the bile, and are caused by the disruption of bile cholesterol homeostasis (CHEN et al., 2021) (ZDANOWICZ et al., 2022).

Cholesterol plays a structural and metabolic role. It is a component of membrane cells, steroid hormones, and a precursor to bile acid. The formation of cholesterol gallstones is triggered by the excessive concentration of cholesterol in the bile (ZDANOWICZ et al., 2022). Generally, circulating cholesterol is transported by lipoproteins and absorbed by the liver, metabolized, and eventually secreted into the bile. Biliary supersaturation with cholesterol is an important predisposing factor for gallstone precipitation (PAK and LINDSETH, 2016).

In addition, advanced age, gender, comorbidities, diet, obesity, rapid weight loss, pregnancy, physical activity, and estrogen are known risk factors for gallstones (ZDANOWICZ et al., 2022) (2020. YU et al., 2020). The majority of affected individuals remain asymptomatic throughout their lives (approximately 80%), while 20% will experience symptoms of biliary colic (2020. YU et al., 2020). Symptomatic patients present with dyspepsia and biliary colic caused primarily by cystic duct obstruction (ZDANOWICZ et al., 2022). It is a constant, sudden, intense pain in the upper right quadrant, lasting more than 30 minutes. Some associated features include nocturnal onset of nausea, vomiting, and pain radiating to the back lasting 1 to 4 hours (PAK and LINDSETH, 2016). Gallstones can lead to serious complications such as cholecystitis, acute cholangitis, perforation, and pancreatitis (ZDANOWICZ et al., 2022).

Gallbladder perforations can be spontaneous or traumatic. Spontaneous gallbladder perforations are uncommon, occurring in 2–10% of patients with cholecystitis. This usually occurs in patients with acute cholecystitis who do not respond to standard treatment. Gallbladder perforations and associated complications are considered surgical emergencies. Early diagnosis and treatment are crucial to decrease patient morbidity and mortality (TANEJA et al., 2011).

In gallbladder evaluation, a variety of imaging modalities are useful. Traditionally, ultrasonography (US) has been the preferred first-line imaging technique for suspected gallbladder disease. Given its rapid rise, computed tomography (CT) has also become a mainstay in the evaluation of gallbladder disease, while magnetic resonance imaging (MRI) is generally considered a

problem-solving tool. Recent technological advances have now spurred the use of contrast-enhanced US (CEUS), high-resolution ultrasound (HRUS), and advanced MRI sequences for gallbladder assessments, allowing for greater diagnostic accuracy (2020. YU et al., 2020). Medical treatment of gallstone disease almost exclusively occurs in cholecystectomy and endoscopic or medical treatment of complications. Cholecystectomy is considered the standard treatment for symptomatic cholelithiasis (PAK and LINDSETH, 2016).

Bile duct injuries (BDIs) after cholecystectomy remain a feared complication. The incidence of BDIs after open cholecystectomy is 0.1% to 0.2% and is 0 to 1% for laparoscopic cholecystectomy as reported in several studies (VENKKATESH SREEPATHI et al., 2024). Biliary injury is categorized into major and minor forms, the former involving the common bile duct or the common hepatic duct, while the latter involving the peripheral ducts. The most common signs and symptoms include abdominal pain, jaundice, fever, ascites, and biliomas. Most cases with bile leakage present within 1 week after surgery, although this period can extend up to 3 months (SAYAR, 2016). Surgical interventions such as cholecystectomy or liver transplantation are the most common cause (S. WÜRSTLE et al., 2019).

Biliomas are encapsulated intra- or extrahepatic collections of bile fluid caused by an injury to the bile duct resulting in bile leaks. Bile duct leaks often close spontaneously, however larger leaks can result in bilomas (S. WÜRSTLE et al., 2019). Initially, bile leaks are usually associated with bruising, but over time, blood clots are replaced by bile. Most biliomas are single, well-defined collections within the liver and can take time to develop (M. RAGAVAN et al., 2014). Symptoms of biloma include jaundice, abdominal pain, loss of appetite, nausea, and vomiting (S. WÜRSTLE et al., 2019).

Bile leakage can be diagnosed by ultrasound, computed tomography, magnetic resonance cholangiopancreatography (MRCP), scintigraphy, endoscopic retrograde cholangiopancreatography (ERCP), fistulography, percutaneous transhepatic cholangiopancreatography (PTC), and laparotomy. ERCP has recently been the most widely employed method for diagnosis and treatment. The basic principles of the endoscopic method include relieving excess pressure within the biliary system (via ESC and/or biliary prosthesis [stent or NBD]) and removing bile from the leak site by biliary prostheses. The most common factor for the success of endoscopic therapy is if the biliary tree has lost its continuity (SAYAR, 2016). In case of infection, differentiating bilomas from liver abscesses is challenging, although abscesses are less caused by interventions and tend to be more encapsulated compared to bilomas (S. WÜRSTLE et al., 2019).

Successful treatment of bile duct injuries depends on multiple factors, such as early identification, evaluation, timing of intervention, chosen procedure, experience of the center, and overall condition of the patient. The main goal of repair is to achieve adequate biliary drainage



without causing postoperative symptoms or liver function disturbances (VENKKATESH SREEPATHI et al., 2024).

CASE DESCRIPTION

Patient, A.I.W.D, male, 35 years old, without comorbidities. She sought care complaining of abdominal pain on the upper right side of the abdomen. Ultrasound of the total abdomen was performed, where hyperechoic polypoid images adhered to the gallbladder walls, measuring from 0.4 to 0.8 cm, were visualized, given the diagnosis of gallbladder polyps. Elective surgery was performed, where laparoscopic cholecystectomy was chosen. The patient was discharged from the hospital on the second day after surgery. On the 7th postoperative day, the patient returned to the emergency room reporting severe pain in the right hypochondrium for one day. Ultrasound of the upper abdomen was performed, in which it returned without alterations, as well as computed tomography of the chest. He was under analgesia for 3 days, with pain improvement, but due to panic syndrome he was discharged, and the patient was released. A week after being released, he underwent blood tests and MRI of the upper abdomen because he was in pain again. Blood tests showed increased bilirubin, and resonance with a moderate amount of free fluid in the peritoneal cavity and diffuse peritoneal thickening, suggesting an acute inflammatory process. Guided drainage was performed to evaluate the liquid, with an outlet of 1500 ml of bile. Laparoscopy was performed with exploration of the bile duct + placement of Kher + choledadoplasty + lysis of the bridle + flushing of the cavity due to loosening of the clip with laceration of the cystic insertion in the common bile duct. Ultrasound of the upper abdomen was performed one day later, with the absence of free fluid in the abdominal cavity. 5 days after surgery, the patient was discharged from the hospital.

Cholangiography of the upper abdomen



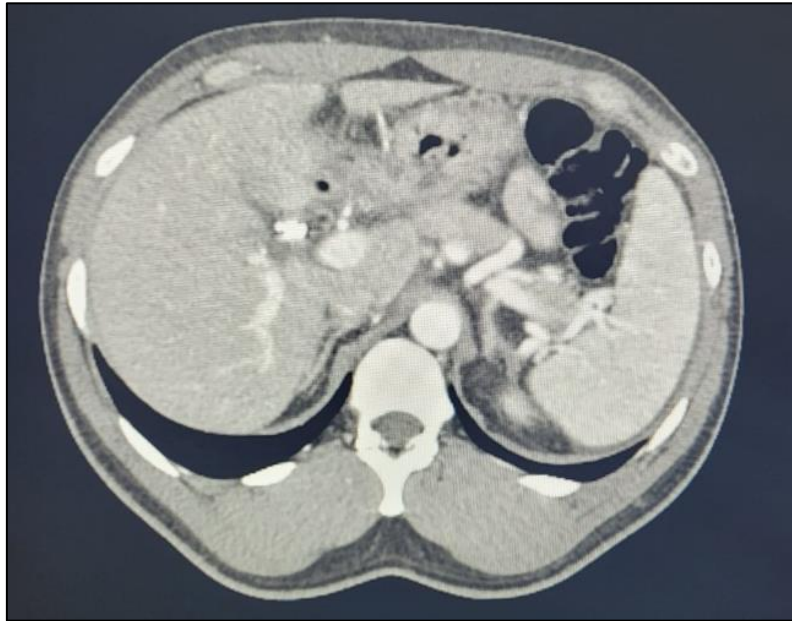
Images provided by Dr. Fernando Pereira de Almeida, Santa Casa de Misericórdia de Presidente Prudente.

USG abdômen superior – gallbladder polyp



Images provided by Dr. Fernando Pereira de Almeida, Santa Casa de Misericórdia de Presidente Prudente.

TC abdômen total



Images provided by Dr. Fernando Pereira de Almeida, Santa Casa de Misericórdia de Presidente Prudente

Intraoperative



Presence of bile in the abdominal cavity

DISCUSSION

The main risk factors for gallstones have been associated with aging, female gender, ethnicity, obesity, hyperinsulinemia, dyslipidemia, and a westernized diet (PAK and LINDSETH, 2016). In the case of the reported patient, it is possible to observe that because he is a young and male person, he is already considered an exception to the rule. Several studies indicate that up to 72% of patients with symptomatic gallstones have ongoing biliary pain or complications resulting from cholecystitis, an inflammation of the gallbladder; pancreatitis, an inflammation of the pancreas; biliary ileum, an obstruction of the intestine to the impaction of gallstones; obstruction of the biliary tract, a blockage of the bile ducts; gallbladder emphysema, a severe form of cholecystitis resulting in

rupture of the gallbladder wall; or perforation, a rupture of the gallbladder (PAK and LINDSETH, 2016).

Ultrasonography (USG) is widely used as the primary imaging modality to evaluate suspected gallbladder disease in patients with right upper quadrant pain or jaundice. It is a safe, non-invasive, real-time imaging modality that is cost-effective, has superior spatial resolution, and is easy to perform. Endoscopic US (EUS) is usually performed for gastrointestinal diseases, but it is also used to evaluate polyps or gallbladder wall thickening. However, the invasiveness of EUS procedures, their low tolerability, high cost, longer duration, and need for sedation are all drawbacks, and it is not routinely used for gallbladder assessment (YU et al., 2020). Because it is considered an excellent for the evaluation of suspected gallbladder disease, the patient in the case was evaluated and correctly diagnosed with gallstones by means of USG.

Bile duct injuries (BDIs) that occur after cholecystectomy are an iatrogenic catastrophe that requires a multidisciplinary approach for optimal treatment (VENKKATESH SREEPATHI et al., 2024). As reported in the case presented above, the patient had a cystic duct injury due to iatrogenic cholecystectomy surgery. Biliomas are localized collections of bile that occur after injury to the intrahepatic or extrahepatic bile ducts. Persistent intrahepatic bilioma can be controlled by needle aspiration, drainage (as done in the case of this study) or endoscopic retrograde cholangiopancreatography and stenting (M. RAGAVAN et al., 2014).

The genesis of bilioma is primarily iatrogenic injury of the bile duct system, whereas spontaneous bilomas are very rare and mostly associated with choledocholithiasis. Surgical interventions such as cholecystectomy or liver transplantation are the most common cause of biliomas, but despite being common, they still have a low prevalence, since The incidence of IDBs after laparoscopic cholecystectomy is 0 to 1%, as reported in several studies. Symptoms of bilioma include jaundice, abdominal pain, loss of appetite, nausea, and vomiting (S. WÜRSTLE et al., 2019) (VENKKATESH SREEPATHI et al., 2024).

According to S. WÜRSTLE et al, interventional biloma drainage approaches, including ERC, PTCD, CT or ultrasound-guided puncture (SGP), and rendezvous intervention appear to be safe and effective. Antibiotics in case of infection and biloma drainage, i.e., using percutaneous transhepatic cholangiodrainage, endoscopic retrograde cholangiography (ERC), or CT-guided puncture or ultrasound are the mainstay of treatment (S. WÜRSTLE et al., 2019).

METHODOLOGY

From a medical case that occurred at the Santa Casa da Misericórdia de Presidente Prudente, together with his medical record, information was collected to carry out this case report. In addition, a search for information was carried out in databases.



CONCLUSION

Therefore, it is concluded that the incidence of lesions in the bile ducts is very low, since after open cholecystectomy it is up to 0.2% and 0 to 1% for laparoscopic cholecystectomy, that is, it is considered a rare case. Biliomas occur after an injury to the ducts, where the key to successful treatment lies in early identification of the problem and referral to the operating room for a better approach, where the main goal of repair is to achieve adequate biliary drainage.

CONFLICT OF INTEREST

The authors agree that there was no conflict of interest during this case report.



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