

BILOMA AFTER SUBTOTAL CHOLECYSTECTOMY-A RARE BUT EXPECTED COMPLICATION

Makashchieva M.¹, Petrovska T.¹, Radeva K.¹, Endzekceva A.^{2,1}, Todorovska A.¹, Durlanova T.¹

¹University Clinic for Surgical Disease "St.Naum Ohridski" Skopje, Macedonia

²PHI- General Hospital Gevgelija

Abstract

Introduction: Biloma is an encapsulated intrahepatic or extrahepatic collection of bile that most commonly occurs as a consequence of iatrogenic biliary injury following cholecystectomy. Diagnosis is primarily based on imaging, with computed tomography (CT) and magnetic resonance cholangiopancreatography (MRCP) playing a central role in the detection of postoperative collections and associated biliary leaks. Management is frequently minimally invasive, with image-guided percutaneous drainage, representing an effective therapeutic option.

Case Presentation: We report the case of a 56-year-old female patient who developed an intrahepatic biloma with secondary abscess formation following subtotal cholecystectomy performed for chronic calculous cholecystitis. Initial ultrasound examination suggested a postoperative biloma, which was further characterized by contrast-enhanced CT demonstrating multiple fluid collections, the largest measuring 15 × 10 cm, with features of early abscess formation.

CT-guided percutaneous drainage was performed, with evacuation of purulent material. Empiric intravenous antibiotic therapy was initiated, resulting in progressive clinical improvement and normalization of inflammatory markers. Follow-up CT demonstrated significant regression of the collections, while MRCP confirmed a patent biliary tree without evidence of active bile leakage. No ERCP or surgical re-intervention was required.

Conclusion: This case highlights the importance of multimodal imaging in the evaluation and management of postoperative biliary complications and demonstrates that selected patients can be successfully managed with a minimally invasive, conservative approach.

Keywords: Biloma; bile leak; MRCP; percutaneous drainage; subtotal cholecystectomy.

Introduction

Biloma represents a localized accumulation of bile either within or outside the liver parenchyma, situated beyond the confines of the biliary system and typically enclosed by a well-defined fibrous capsule. The most common underlying cause is iatrogenic injury to the biliary tract, most frequently occurring during cholecystectomy, while blunt abdominal trauma represents the second leading cause (1).

Clinical manifestations may include abdominal pain, fever, jaundice, leukocytosis, or prolonged postoperative recovery; however, symptoms are often nonspecific, potentially delaying diagnosis (2).

Postoperative bile leakage following laparoscopic cholecystectomy may result from common bile duct injury, inadequate cystic duct closure, or anatomical variations involving accessory biliary ducts (3). When infected, bilomas may progress to hepatic abscess formation and potentially lead to systemic infection if not promptly recognized and treated.

Subtotal cholecystectomy is recognized as an important bail-out procedure in difficult gallbladder surgery, particularly when the critical view of safety cannot be achieved because of severe inflammation, distorted anatomy, or dense adhesions (4). Although this approach decreases the risk of major bile duct injury, it is associated with a higher incidence of postoperative bile leakage and related complications (5).

Ultrasound examination is usually the initial imaging modality used in suspected biloma; however, CT provides superior evaluation of the extent of collections and their relationship to surrounding anatomical structures (6). MRCP offers high sensitivity and specificity for detecting biliary leaks while simultaneously providing detailed visualization of the biliary anatomy (3).

The differential diagnosis of biloma includes lymphocele, abscess, hematoma, pancreatic pseudocyst, hepatic cyst, seroma, and cystic metastatic lesions (7). These conditions should be considered when evaluating postoperative hepatobiliary fluid collections because of overlapping imaging findings and clinical presentation.

Case Presentation

A 56-year-old female patient with a history of chronic calculous cholecystitis underwent subtotal cholecystectomy due to dense adhesions and difficult operative anatomy. The immediate postoperative course was initially uneventful, and the patient was discharged home.

Three days after surgery, the patient developed persistent right upper quadrant abdominal pain associated with mild nausea. Abdominal ultrasound performed at a local hospital demonstrated a heterogeneous subhepatic fluid collection suggestive of postoperative biloma, and the patient was referred to our tertiary care center for further evaluation.

Laboratory investigations revealed mild leukocytosis and elevated C-reactive protein levels, consistent with an inflammatory process.

Contrast-enhanced CT of the abdomen demonstrated a large subhepatic fluid collection measuring approximately 15 × 10 cm with heterogeneous content and an air-fluid level. Areas of wall thickening suggested early abscess formation. Adjacent to the inferior liver margin, an additional organized collection measuring approximately 25 × 40 mm was identified. A smaller loculated collection measuring 18 × 11 mm was also present in the right paracolic gutter. Mild surrounding fat stranding and adjacent tissue edema were noted. These findings were consistent with postoperative biloma complicated by secondary abscess formation.

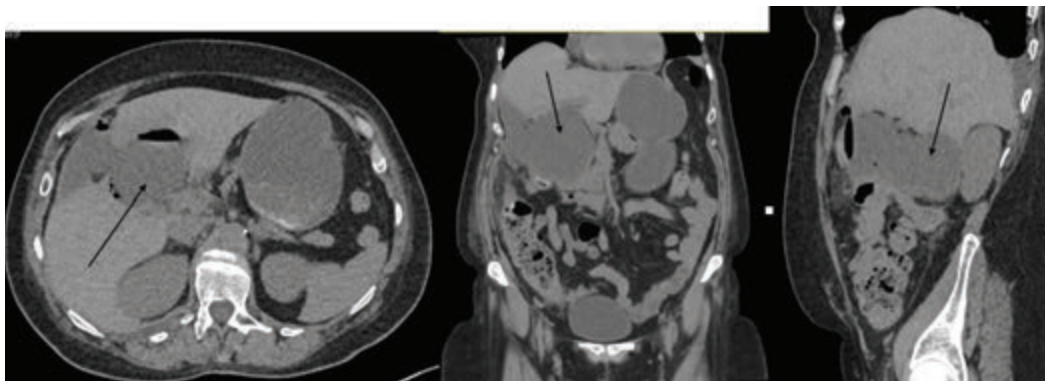


Figure 1. Contrast-enhanced CT images demonstrating a large subhepatic biloma with an air-fluid level (black arrow), consistent with secondary abscess formation. Smaller adjacent collections are also visible.

Following confirmation of the diagnosis, CT-guided percutaneous drainage was performed. After local preparation and administration of local anesthesia, a 12 Fr drainage catheter was inserted into the largest collection under CT guidance. Purulent material was immediately evacuated, confirming the infected bile collection. The drainage catheter was initially positioned deeply within the cavity and was partially withdrawn during follow-up to optimize drainage of residual fluid collections.

Empiric intravenous antibiotic therapy with ceftriaxone and metronidazole was initiated to provide broad-spectrum coverage against common biliary pathogens. The patient demonstrated gradual clinical improvement, with reduced inflammatory markers and resolution of abdominal pain.

Follow-up contrast-enhanced CT demonstrated significant regression of the previously drained collection, with only a small residual fluid component remaining. No newly formed collections were identified.

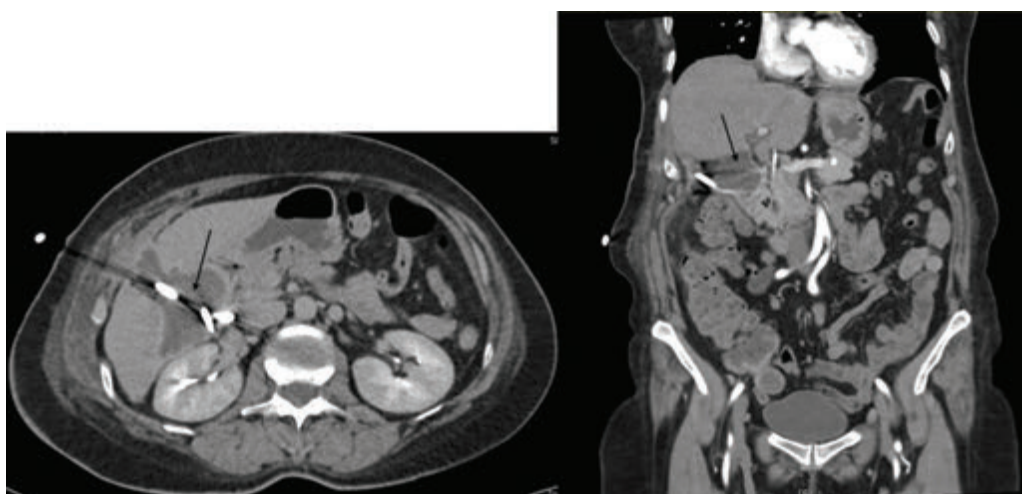


Figure 2. Follow-up contrast-enhanced CT demonstrating significant regression of the previously drained biloma with the drainage catheter in situ. Only minimal residual fluid remains (arrow).

MRCP was subsequently performed for further evaluation of the biliary anatomy. The examination demonstrated patent intrahepatic and extrahepatic bile ducts without evidence of obstruction.

tion, choledocholithiasis, or active bile leakage. The cystic duct stump and a small gallbladder remnant were visualized.

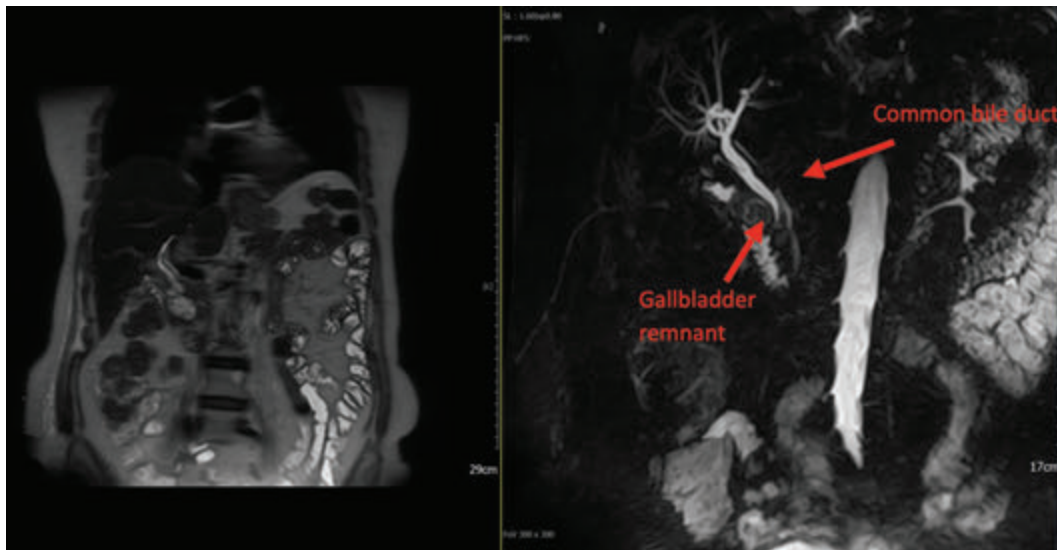


Figure 3. MRCP demonstrating patent intrahepatic and extrahepatic bile ducts without evidence of obstruction or filling defects. The common bile duct measured 7 mm (arrow). The cystic duct stump and a small gallbladder remnant are visualized (arrow).

Conservative treatment was continued, including catheter drainage, intravenous antibiotics, and clinical monitoring. The patient remained hemodynamically stable throughout hospitalization and showed progressive clinical recovery. Follow-up laboratory findings demonstrated normalization of inflammatory markers. No ERCP or surgical re-intervention was required.

At outpatient follow-up, the patient remained asymptomatic, with no evidence of recurrent fluid collections or biliary complications.

Discussion

Subtotal cholecystectomy is widely accepted as a safe alternative in difficult gallbladder surgery when identification of the biliary anatomy is compromised. Although this approach significantly reduces the risk of major bile duct injury, postoperative bile leakage remains one of the most commonly reported complications (4,5). Biloma formation may result from leakage from the cystic duct stump, remnant gallbladder, or small accessory biliary branches.

Previous reports have demonstrated that postoperative bilomas may present with nonspecific clinical symptoms, including abdominal pain, fever, nausea, and elevated inflammatory markers, thereby delaying diagnosis (1,2). In the present case, early postoperative abdominal pain prompted imaging evaluation, allowing timely identification of this complication before progression to severe sepsis.

CT plays a central role in evaluating postoperative biliary complications because it accurately defines the size, extent, and characteristics of fluid collections while guiding minimally invasive drainage procedures (6). In our patient, CT findings of heterogeneous fluid with an air-fluid

level and wall thickening suggested secondary infection and early abscess formation, supporting the need for prompt intervention.

Several studies have emphasized the value of percutaneous drainage combined with antibiotic therapy as first-line treatment for large or infected bilomas (6,8). Previous reports describe biloma as a potentially serious postoperative complication requiring prompt radiological diagnosis and minimally invasive management. Several published cases have demonstrated successful conservative treatment with percutaneous drainage in clinically stable patients, whereas others have required invasive biliary intervention because of persistent leakage or ongoing obstruction. Similar to previously reported cases, our patient demonstrated rapid clinical improvement following CT-guided drainage and broad-spectrum intravenous antibiotic therapy. However, unlike several published reports in which ERCP with biliary stenting was necessary, our patient achieved complete resolution without endoscopic intervention, emphasizing the importance of individualized imaging-based management.

MRCP has emerged as a valuable non-invasive modality for evaluating the biliary tree in postoperative patients. In contrast to ERCP, MRCP avoids procedure-related complications while still providing excellent visualization of biliary anatomy and potential sites of leakage (3). Previous reports have shown that many patients with resolving collections and no evidence of ongoing bile leakage can be managed successfully without endoscopic intervention.

In many published cases of postoperative biloma, ERCP with biliary stenting was required because of persistent leakage or ongoing biliary obstruction (3,8). Reports involving postoperative bile leaks after subtotal cholecystectomy frequently describe the need for combined endoscopic and radiological management to achieve complete resolution. In contrast, our patient was successfully managed conservatively with CT-guided drainage, antibiotics, and close imaging follow-up alone. MRCP confirmed the absence of active bile leakage, thereby avoiding unnecessary invasive endoscopic intervention.

This case highlights the complementary roles of CT and MRCP in the management of postoperative biliary complications. CT enables accurate diagnosis and image-guided treatment, whereas MRCP provides a detailed assessment of biliary anatomy and helps select patients who may not require ERCP. Furthermore, this case emphasizes the importance of follow-up imaging in documenting regression of collections and confirming their resolution.

Conclusion

Biloma with secondary abscess formation represents a clinically significant complication following subtotal cholecystectomy and requires prompt recognition and appropriate management.

CT-guided percutaneous drainage remains the cornerstone treatment for large or infected bilomas, while MRCP provides valuable non-invasive assessment of the biliary tree and may help determine the need for further intervention.

In selected patients, conservative management combining drainage, antibiotic therapy, and imaging follow-up may achieve complete resolution while avoiding unnecessary endoscopic or surgical procedures.

Declarations

Ethics Approval and consent to participate: This study was approved by the Ethics Committee of the University Clinic for Surgical Diseases “St. Naum Ohridski”, Skopje, North Macedonia. For the publication of this case report and accompanying images, a written informed consent was obtained from the patient.

Informed consent: Written informed consent was obtained from the patient for publication of this case report and accompanying images.

Conflict of Interest: The authors declare no conflict of interest.

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Availability of Data and Materials: The data supporting the findings of this study are available from the corresponding author upon reasonable request.

Authors' Contributions: M. M. – primary author; manuscript preparation, image acquisition, analysis, and interpretation. P. T. – supervision, critical revision, and final approval of the manuscript. R. K. – data collection. E. A. – literature review. T. A. – manuscript drafting. D. T. – manuscript editing and final preparation

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