

Persistent Biloma Following Laparoscopic Cholecystectomy: A Case Report

Laparoskopik Kolesistektomi Sonrası İnatçı Bilioma: Bir Olgu Sunumu

 **Nebi Evren Küçükoğlu,  İsmet Özaydın**

Düzce University, Faculty of Medicine, Düzce, Türkiye

Abstract

Biloma is an uncommon but clinically significant complication following laparoscopic cholecystectomy. Although most cases resolve with minimally invasive interventions, persistent bilomas present a diagnostic and therapeutic challenge. We report the case of a 45-year-old female patient who developed a persistent biloma after undergoing laparoscopic cholecystectomy. Despite initial percutaneous drainage and conservative management, the collection reaccumulated, necessitating repeated interventions. Detailed imaging and multidisciplinary evaluation guided the management process. This case highlights the complexity of diagnosing and managing persistent bilomas, emphasizing the importance of timely imaging, tailored interventional strategies, and close follow-up. Compared with previously reported cases, our findings underscore the role of multidisciplinary decision-making in preventing prolonged morbidity. Persistent bilomas, though rare, should be considered in patients with recurrent abdominal collections following laparoscopic cholecystectomy. This case contributes to the growing body of literature by illustrating both the challenges and effective strategies in managing this uncommon complication.

Keywords: Biloma, Laparoscopic cholecystectomy, persistent biloma

INTRODUCTION

Biloma was first described by the German anatomist Hubert von Luschka in 1884, and it entered modern medical literature in 1979 when Gould and Patel defined it as an encapsulated collection of bile outside the biliary tree.^[1] Although relatively rare, bilomas represent a clinically significant complication that can arise following hepatobiliary surgery, abdominal trauma, or interventional procedures.^[2-4] Among these, laparoscopic cholecystectomy remains the most frequently reported surgical context associated with biloma formation.^[3,5]

Öz

Biloma, safra yolları dışında, genellikle iatrojenik yaralanmalar sonucu oluşan kapsüllü safra birikimi olarak tanımlanır. Klinik belirtileri asemptomatik durumlardan şiddetli karın ağrısı ve peritonite kadar geniş bir yelpazede değişiklik gösterebilir. İlk tedavi, minimal invaziv yöntemlere öncelik vermelidir ve gerektiğinde cerrahi müdahalelere başvurulmalıdır. MRCP gibi ileri görüntüleme teknikleri ve sitolojik analizler tanıya destekler ve tedavi planamasına yardımcı olur. Biloma tedavisinde erken tanı ve bireyselleştirilmiş yönetim, komplikasyonların önlenmesi açısından kritik öneme sahiptir. Multidisipliner bir yaklaşım, etkili hasta yönetimini kolaylaştırır ve tedavi sonuçlarını iyileştirir. Minimal invaziv müdahaleler genellikle tercih edilse de cerrahi müdahale bazen kaçınılmaz olabilir. Zamanında yapılan müdahaleler ve düzenli takip, tedavi etkinliğini artırır ve olumlu sonuçlar sağlar.

Anahtar Kelimeler: Biloma, persistan biloma, laparoskopik kolesistektomi

CASE

The clinical presentation of bilomas varies according to the rate and extent of bile leakage. Rapid accumulation can lead to encapsulated collections and peritonitis, whereas slower leakage is more likely to cause mild inflammation of the bile ducts and peritoneum.^[2] Most postoperative bilomas are small, asymptomatic, and resolve spontaneously or with minimally invasive procedures such as percutaneous drainage.^[6] However, persistent or recurrent bilomas pose greater challenges, often necessitating repeated interventions



and multidisciplinary management.^[7] Delayed diagnosis or inadequate treatment may result in serious morbidity, including infection, sepsis, or prolonged hospitalization.^[8,9]

Although several therapeutic strategies—ranging from percutaneous drainage and catheter placement to laparoscopic interventions—have been reported, there is no universally accepted guideline for the optimal management of persistent bilomas.^[6,10] Given this uncertainty, detailed case reports remain essential for expanding the clinical knowledge base and guiding decision-making in complex scenarios.

Here, we present the case of a middle-aged female patient who developed a persistent biloma following laparoscopic cholecystectomy. This report aims to highlight the diagnostic challenges, management strategies, and clinical implications associated with this rare but significant complication.

A 39-year-old female patient with a history of partial cholecystectomy presented to our clinic with complaints of right upper quadrant (RUQ) pain. A computed tomography (CT) scan performed on December 4, 2023 (Figure 1) demonstrated a



Figure 1. A decrease in gallbladder volume with surgical materials observed at this level, consistent with the postoperative process in a patient with a history of partial cholecystectomy.

decreased gallbladder volume with surgical materials observed at this level, findings consistent with the postoperative status of a patient with a history of partial cholecystectomy. Routine blood tests revealed no significant abnormalities (Table 1).

Due to the patient's recurrent RUQ pain, a laparoscopic cholecystectomy was performed on December 12, 2023. The postoperative course was uneventful, and the patient was discharged on day 2. However, on postoperative day 13, she re-presented to the outpatient clinic with recurring RUQ pain. On examination, localized tenderness was noted in the RUQ, though there were no signs of guarding or rebound tenderness.

Table 1. Routine Blood Test Results of the Patient

| Test Name | Result | Test Unit | MIN - MAX |
|---|--------|----------------------------------|----------------------------------|
| AST | 16 | IU/L | 5 - 40 |
| ALT | 14 | U/mL | 5 - 41 |
| Glucose (Fasting) | 79 | mg/dL | 70 - 106 |
| Urea | 27.00 | mg/dL | 15 - 50 |
| Sodium | 135 | mEq/L | 135 - 145 |
| Potassium | 4.21 | mEq/L | 3.5 - 5.1 |
| Creatinine | 0.61 | mg/dL | 0.5 - 1 |
| TSH | 1.36 | uIU/mL | 0.27 - 4.2 |
| Free T4 | 1.19 | ng/dL | 0.93 - 1.7 |
| Free T3 | 3.37 | pg/mL | 2 - 4.4 |
| CKD-EPI eGFR | 115.00 | mL/dk/1.73 m ² | - |
| Leukocyte (WBC) | 8.88 | 10 ³ /mm ³ | 4 - 10.6 |
| Erythrocyte (RBC) | 3.92 | L | 10 ⁶ /mm ³ |
| Hemoglobin (HGB) | 12.66 | L | g/dL |
| Hematocrit (HCT) | 37 | L | % |
| Mean Corpuscular Volume (MCV) | 94 | fL | 80 - 100 |
| Mean Corpuscular Hemoglobin (MCH) | 32.33 | H | Pg |
| Mean Corpuscular Hemoglobin Concentration (MCHC) | 34.27 | | g/dL |
| Red Cell Distribution Width (RDW) | 12.4 | | % |
| Platelet (PLT) | 273 | 10 ³ /mm ³ | 150 - 400 |
| Mean Platelet Volume (MPV) | 8.2 | μm ³ | 7 - 11 |
| Plateletcrit (PCT) | 0.224 | % | 0.2 - 0.4 |
| Platelet Distribution Width (PDW) | 11.5 | | % |
| Lymphocyte % | 20.2 | | 16.1 - 48.7 |
| Lymphocyte Count | 1.79 | 10 ³ /mm ³ | 0.9 - 3.7 |
| Monocyte % | 3.4 | L | % |
| Monocyte Count | 0.3 | 10 ³ /mm ³ | 0.3 - 0.9 |
| Neutrophil % | 71.9 | | 39.9 - 75.4 |
| Neutrophil Count | 6.38 | 10 ³ /mm ³ | 1.8 - 7.8 |
| Eosinophil % | 3.8 | | 0.8 - 7.3 |
| Eosinophil Count | 0.34 | 10 ³ /mm ³ | 0.1 - 0.6 |
| Basophil % | 0.7 | | 0.2 - 1.3 |
| Basophil Count | 0.06 | L | 10 ³ /mm ³ |
| Activated Partial Thromboplastin Time (APTT) | 34.9 | Sn | 22 - 36 |
| Prothrombin Time (%) | 115.4 | % | 78 - 121 |
| Prothrombin Time (International Normalized Ratio) | 0.94 | INR | 0.8 - 1.2 |
| Prothrombin Time (seconds) | 10.4 | Sn | 9.1 - 13.5 |

Given the clinical suspicion of biloma, a non-contrast CT scan was obtained (Figure 2), which confirmed the presence of a loculated fluid collection. Interventional radiology subsequently performed a paracentesis under ultrasound (USG) guidance, aspirating approximately 20 cc of dense fluid from the gallbladder fossa using an 18G Chiba needle. The procedure was completed without complications, consistent with the reported safety of USG-guided interventions in biloma management.^[6]



Figure 2. Metallic appearances consistent with suture material are observed in the gallbladder fossa, along with an increased fluid collection area measuring 44x33 mm in size (bilioma? abscess?).

Eight days later, magnetic resonance cholangiopancreatography (MRCP) was performed for further evaluation (Figure 3). MRCP is considered a non-invasive and reliable modality for assessing biliary leakage and related complications.^[7] A repeat percutaneous drainage under USG guidance was carried out the following day.

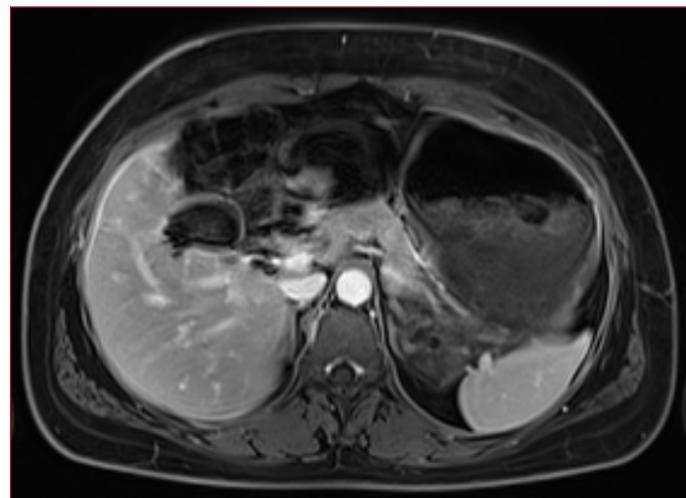


Figure 3. The gallbladder could not be visualized (surgical removal?). A 30x40 mm loculated fluid collection was observed in the gallbladder fossa, appearing hyperintense on T2-weighted images, hypointense on T1-weighted images, non-enhancing, and without diffusion restriction (Bilioma?).

The patient remained asymptomatic during follow-up. A repeat hepatobiliary ultrasound performed 10 days later demonstrated a 34 x 29 mm loculated fluid collection in the gallbladder fossa, with irregular walls and a wall thickness of 3.5 mm. Another 10 days later, a follow-up non-contrast CT scan confirmed persistence of the collection (Figure 4).

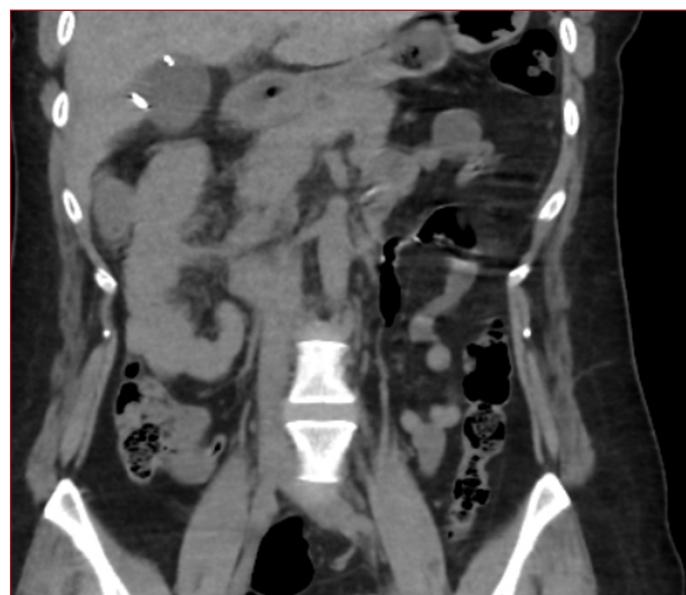


Figure 4. Metallic surgical materials are observed in the gallbladder fossa and portal hilum. A collection area measuring 38x33 mm in the gallbladder fossa shows slight reduction but persists (Bilioma?).

Samples obtained from percutaneous drainage were analyzed for culture, biochemistry, and cytology. No bacterial growth was observed in culture. Biochemical analysis revealed amylase: 7.00 U/L, lipase: 10.20 U/L, direct bilirubin: 3.61 mg/dL, and indirect bilirubin: 3.91 mg/dL. Cytology showed "acellular, partially particulate, dense proteinaceous material." Because of recurrent RUQ pain, a diagnostic laparoscopy was performed on February 26, 2024. Intraoperative exploration revealed a cystic structure within the gallbladder fossa

consistent with a biloma, which was excised. The abdominal cavity was irrigated with 2000 cc of saline until clear and aspirated. A drain was placed, and minimal serous drainage was observed postoperatively. The patient was discharged on postoperative day 2, as no pathology was detected during subsequent follow-up.

At the 1-month postoperative follow-up, a non-contrast CT scan demonstrated complete regression of the collection site (**Figure 5**). At the 2-month follow-up, a repeat hepatobiliary ultrasound confirmed no residual or recurrent abnormality.

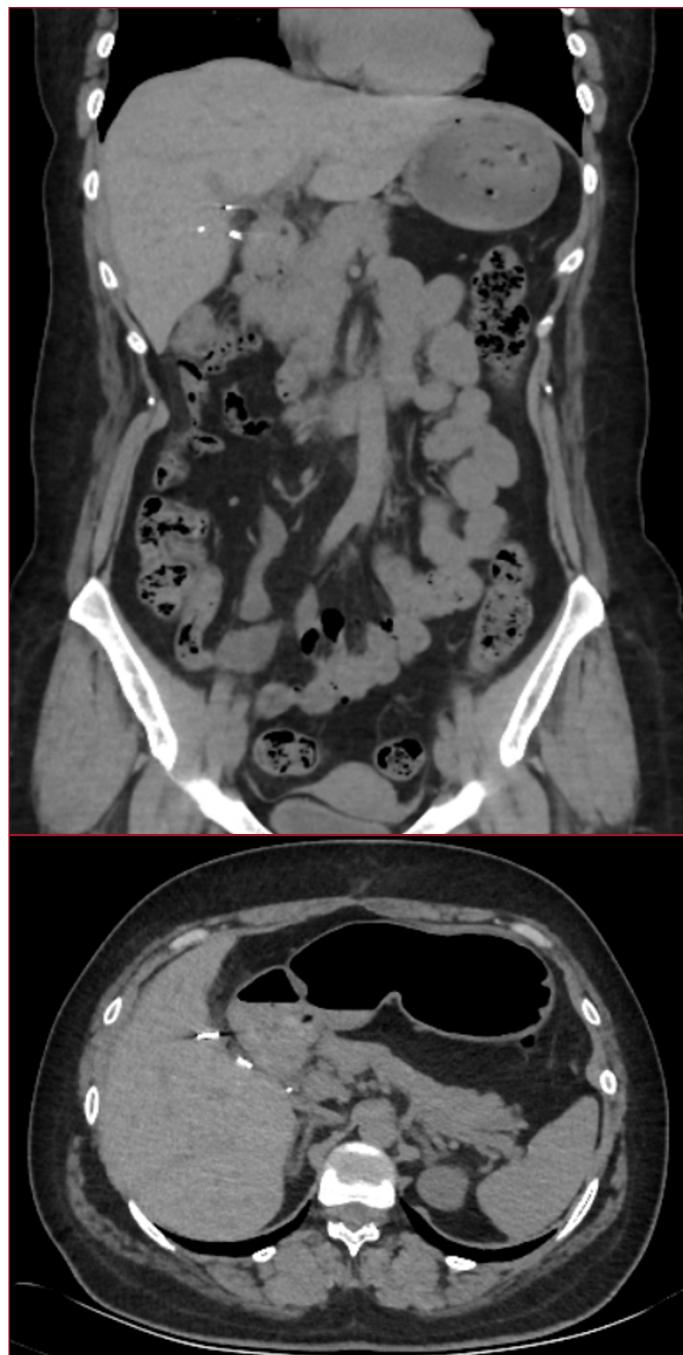


Figure 5. "The gallbladder fossa was not visualized (post-cholecystectomy). The previously described collection at the surgical site has completely regressed."

DISCUSSION

Bilomas most commonly result from iatrogenic trauma associated with hepatobiliary surgery or interventional procedures, including laparoscopic cholecystectomy, endoscopic retrograde cholangiopancreatography (ERCP), percutaneous catheter drainage, and blunt abdominal trauma.^[3] The majority of biloma lesions following laparoscopic cholecystectomy develop within the first 7 days, as observed in our case.^[5]

The impact of biloma formation on surrounding tissues is influenced by the rate of bile leakage. Slow leaks stimulate fibrosis by inducing localized inflammation, which may act as a protective mechanism.^[6] In contrast, rapid leaks often precipitate peritonitis and facilitate encapsulation by promoting adhesion formation.^[6]

Spontaneous bilomas secondary to gallbladder perforation are rare. According to the classification by Anderson and Nazem, Type 2 perforations (abscess perforations) can result in biloma formation, with a reported mortality rate of 4%.^[7] Clinically, bilomas may remain asymptomatic or present with a wide spectrum of manifestations ranging from abdominal fullness, RUQ pain, nausea, and vomiting to sepsis.

Non-invasive imaging modalities are critical in diagnosis. Abdominal ultrasonography (USG) can demonstrate cystic or anechoic collections with septations and is also useful for guiding interventional procedures such as percutaneous drainage. Computed tomography (CT) is valuable for delineating the extent and boundaries of the fluid collection, although it lacks specificity for differentiating bilomas from hematomas, seromas, or pseudocysts. Magnetic resonance cholangiopancreatography (MRCP) is a reliable non-invasive technique for identifying the source and localization of bile leaks.^[8] ERCP, in contrast, serves both diagnostic and therapeutic purposes in biloma management.

Treatment options depend on the size, clinical presentation, and persistence of the collection. Small, asymptomatic bilomas may resolve spontaneously. However, spontaneous resolution is unlikely for collections exceeding 4 cm in diameter, in which case intervention is typically required.^[9] USG- or CT-guided percutaneous catheter drainage represents a safe and effective non-surgical option. In cases of persistent bile leaks, ERCP with stent placement is often employed to reduce and control leakage. When minimally invasive measures are insufficient, surgical exploration may be warranted to drain the biloma and address the underlying bile leak.^[6,10]

A case report published in 2022 described a female patient who presented with severe RUQ pain on the 7th postoperative day following laparoscopic cholecystectomy. Abdominal and pelvic CT scans revealed intra-abdominal fluid accumulation, and subsequent laparoscopic exploration identified bile leakage from the Luschka ducts. The ducts were sutured, and a drain was placed. This case shares similarities with ours in terms of both complication type and clinical course.^[10] Another report emphasized the importance of tailoring treatment

according to the patient's general condition, vital signs, and laboratory findings.^[3] In contrast to that case, where invasive management was prioritized, our patient was stable, had no significant comorbidities, and therefore underwent the least invasive interventions as the initial therapeutic approach.

CONCLUSION

This case underscores the importance of a multidisciplinary approach in the diagnosis and management of biloma following cholecystectomy. An escalation strategy, beginning with minimally invasive techniques and advancing to more invasive interventions when indicated, is essential for optimizing patient outcomes. Our experience further illustrates that less invasive methods may not always achieve definitive resolution, and surgical intervention can become necessary. Early imaging, individualized treatment planning, and close follow-up are critical to preventing complications and ensuring effective management of this rare but clinically significant condition.

ETHICAL DECLARATIONS

Informed Consent: All patients signed the free and informed consent form.

Referee Evaluation Process: Externally peer-reviewed.

Conflict of Interest Statement: The authors have no conflicts of interest to declare.

Financial Disclosure: The authors declared that this study has received no financial support.

Author Contributions: All of the authors declare that they have all participated in the design, execution, and analysis of the paper, and that they have approved the final version.

REFERENCES

1. Gould L, Patel A. Ultrasound detection of extrahepatic encapsulated bile: "biloma". *AJR Am J Roentgenol.* 1979;132(6):1014-5.
2. Göß A. Analyse des Keimspektrums und Evaluation der Behandlungsstrategien bei Patienten mit Biliomen. Diss. Technische Universität München, 2019.
3. Vural A, Altintop İ. Laparoskopik Kolesistektomi Sonrası Gelişen Ciddi bir Komplikasyon: Akut Batına Olan Dev Biloma. *J Contemp Med.* 2020;10(2):281-3.
4. Cortés JS, Polanía-Galindo SA, Polanía-Liscano HA. Spontaneous Biloma: A Case Report and Literature Review. *Revista Colomb Gastroenterol.* 2023;38(1):106-10.
5. Muleta J, Belayneh E, Haile K, Worku A. A rare case of bile leak due to type 2 duct of Luschka injury post open cholecystectomy: a case report. *J Surg Case Rep.* 2024;2024(3):rjae179.
6. Kozarek R, Gannan R, Baerg R, Wagonfeld J, Ball T. Bile leak after laparoscopic cholecystectomy. Diagnostic and therapeutic application of endoscopic retrograde cholangiopancreatography. *Arch Intern Med.* 1992;152(5):1040-3.
7. Kannan U, Parshad R, Regmi SK. An unusual presentation of biloma five years following cholecystectomy: a case report. *Cases J* 2009;2:8048
8. Anderson BB, Nazem A. Perforations of the gallbladder and cholecystobiliary fistulae: a review of management and a new classification. *J Natl Med Assoc.* 1987;79:393-9.
9. Limani N, Misimi S, Nikolovski A. Large biloma as the initial presentation of gallbladder perforation: a case report and literature review. *J Surg Case Rep.* 2023;2023(12):rjad669.
10. Garcia S, Concepción AM, Wakoff C. Bile leak due to Luschka duct injury after laparoscopic cholecystectomy: A case report. *Cureus* 2022;14:e28427.