



## Case Study

# Computed tomography and ultrasonographic correlation of intrahepatic biloma in an immuno-compromised patient- An incidental finding: A case study

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The term biloma is used to describe an encapsulated collection of bile within the abdomen, or around the liver and is usually a result of bile duct disruption. The formation of bilomas usually follows abdominal trauma, laparoscopic intervention within the hepatobiliary system or pancreatic cancer. The correct diagnosis of a likely biloma is important as several other pathologies may give similar clinical or laboratory presentation. Patient may show clinical features of pain in the right upper quadrant, abdominal distension, malaise, anorexia, nausea, chills and fever. Diagnostic imaging work-up may include Abdominal ultrasound, CT scan, Magnetic Resonance cholangio-pancreatography (MRCP) and occasionally gallbladder scintigraphy. Generally, the presence of atraumatic biloma in an immune-compromised patient is somewhat uncommon in literature. We present a case of intrahepatic biloma in a 63 year old hypertensive male, with immune-compromise with no recent or past history of trauma or laparoscopic abdominal procedure. The sonographic appearance is that of a single or multi-loculated anechoic lesions with visible distal acoustic enhancement, with or without internal echoes/debris. Occasionally, there may be few septations, but a well-defined capsule is usually absent. Bilomas of long-standing origin may develop thicker margins and this may become confusing. Our patient presented with this classical ultrasound features of an anechoic lesion, with through transmission and also communicates with the biliary system. Diagnostic accuracy is enhanced by a correlation of clinical findings and recent history with ultrasonographic findings. The clinical, laboratory as well as sonographic and computed tomographic (CT) correlations are presented.

**Keywords:** Biloma, immune-compromised, atraumatic, laparotomy, hepatobiliary system.

## INTRODUCTION

### Case study

Our patient was a 63 year old immuno-compromised male. He was a known hypertensive and presented with a history of abdominal bloating, right upper quadrant discomfort, hiccough and jaundice as well as pyrexia of unknown origin.

Initial laboratory work up shows elevated conjugated bilirubin as well as positive HIV test. There was no distal bile duct obstruction. The dilated bile ducts were considered secondary to the biloma. Abdominal ultrasound

scan as well as Contrast CT were performed on the patient.

The development of an intra-abdominal bile collection (biloma) in the sub-hepatic space is most often secondary to iatrogenic injury of the extra-hepatic ducts, resulting in the disruption of biliary circulation. The alkaline characteristic of bile triggers inflammation in the surrounding parenchyma leading to adhesion and demarcation of the biliary collection (Gould and Patel, 1979); Vazquez et al. (1985).

Historically, the term biloma was used to describe a well-differentiated collection of bile outside the biliary tree (Gould and Patel, 1979) but the term has been extended to include also intrahepatic and intra-peritoneal biliary stasis or collection of bile (Zegel et al., 1981; Fujiwara et al., 1998; Kim et al., 1994).

Bilomas can result from a spontaneous rupture of the biliary duct following choledocholithiasis or due to cholangiocarcinomas, acute cholecystitis, tuberculosis, hepatic abscesses or infarctions. Rarely, an association with pancreatic cancer or sickle cell disease is described (Kim et al., 1994). Bilomas can resolve spontaneously (Han et al., 1995).

Biloma has resulted as a complication of post-operative laparoscopic cholecystectomy (Melton et al., 2002). Whereas the hepatic subcapsula biloma is a rare complication of laparoscopic surgeries (Melton et al., 2002; Pavlidis et al., 2002; Festekjian et al., 1997); Cervantes et al. (1994), the presence of a non-iatrogenic and atraumatic biloma in an immune-compromised patient is quite rare and forms the basis of our report.

Biloma could be also a possible complication after transcatheter arterial chemoembolization, which is a common treatment option for intermediate hepatocellular carcinoma. (Huang et al., 2007; Koda et al., 2001).

Diagnosis of bilomas can be a dilemma as it can involve a wide spectrum of clinical presentations, ranging from being asymptomatic to obvious clinical manifestations, as well as laboratory and specific imaging features.

Patient may show clinical features of pain in the right upper quadrant, abdominal distension, malaise, anorexia, nausea, chills and fever. All these were present in the patient under review. If associated with choledocholithiasis, the bilomas may occur with jaundice, dark urine and dark stools.

Although, no intraductal calculi were identified, the long-standing biliary stasis may explain the presence of jaundice in this patient. Laboratory exams may indicate abnormal values of neutrophilic leucocytosis and raised erythrocyte sedimentation rate and C-reactive protein (CRP), as well as altered aspartate aminotransferase and alanine aminotransferase values (Kim et al., 1994). However, no fluid analysis result was available at the time of presentation if jaundice is present, elevated values of serum alkaline phosphatase, total and direct bilirubin) as the result of biliary obstruction (Melton et al., 2002)

Bilomas must be differentiated from other similar findings, such as lymphocele, abscesses, hematomas, pseudocysts, liver cysts and seroma (Kim et al., 1994).

Diagnostic imaging work-up may include Abdominal ultrasound, CT scan, Magnetic Resonance cholangiopancreatography (MRCP).

Occasionally, Gallbladder scintigraphy with technetium-99 may help to differentiate the biloma from hematomas or liver abscesses. Endoscopic retrograde cholangiography may provide not only further diagnostic confirmation but also a therapeutic option, allowing decompression of the bile duct and biliary drainage of the collection (Melton et al., 2002).

Ultrasound is the initial choice in the diagnostic imaging series, with the advantage of being non-invasive, low cost, availability and also the possibility of bed-side examination. The latter is important when a rapid diagnosis is required for subsequent quick therapeutic intervention. Focused assessment with sonography for trauma (FAST) has a high predictive value and has been suggested for screening hemodynamically stable patients with blunt abdominal trauma. It is particularly useful in the exclusion of ruptured bile ducts and free peritoneal fluid. (Melton et al., 2002)

Ultrasound may also be invaluable if percutaneous aspiration of suspected bile collection is contemplated (Melton et al., 2002) and to monitor progress of stable disease over time.

The sonographic appearance is that of a single or multi-loculated anechoic lesions with visible distal acoustic enhancement, with or without internal echoes/debris. Occasionally, there may be few septations, but a well defined capsule is usually absent. Bilomas of long-standing origin may develop thicker margins and this may become confusing.

Our patient presented with the classical ultrasound features of an anechoic lesion, with through transmission and also communicates with the biliary system. Diagnostic accuracy is enhanced by a correlation of clinical findings and recent history with ultrasonographic findings. ( Figure A, B and C).

Sonographically, the differential diagnosis would be intrahepatic subacute hematoma and choledochal cyst, the latter being unlikely in this age group.

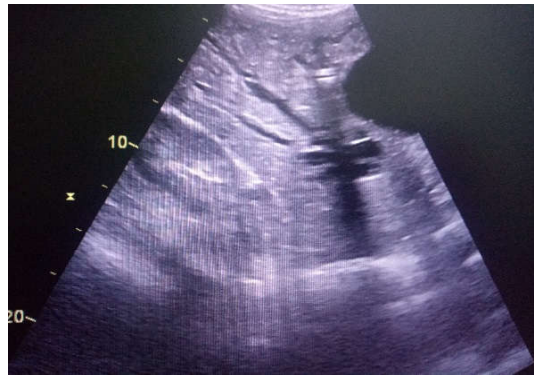
In equivocal cases, an ultrasound-guided percutaneous aspiration can improve diagnostic confidence, if it yields a high aspirated fluid/serum bilirubin (Melton et al., 2002).

This may also have a therapeutic value, although associated discomfort and risk of infections remain a drawback.

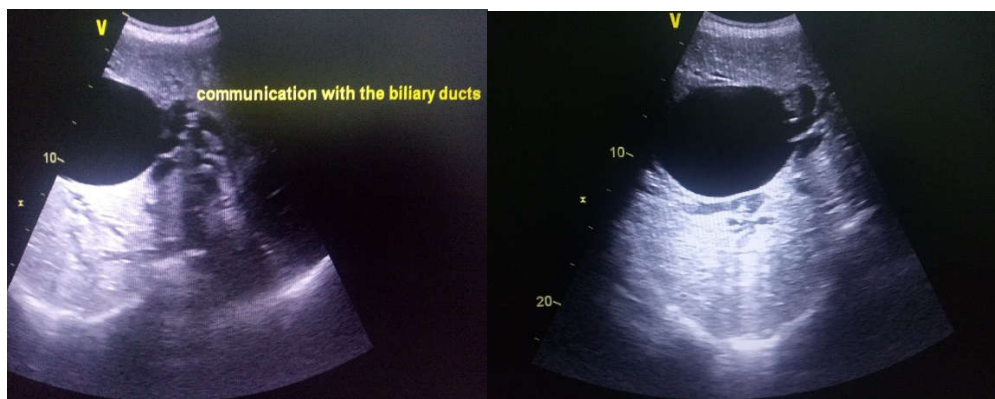
CT appearances are those of a hypodense lesion, with fluid attenuation. It has well defined margins and show no evidence of peripheral or capsular enhancement with contrast. Lesion was seen to communicate with dilated intrahepatic biliary ducts. (Figure D).

MRI can be very useful in demonstrating biliary communication. Biliary fluid shows variable signal intensity on T1-weighted imaging, and high signal intensity on T2-weighted imaging, and often similar to the signal intensity within an acalculous gallbladder lumen.

Both gadolinium and manganese-based MRI contrast agents that are excreted through the biliary system are



**Figure A:** Sonogram showing dilated intrahepatic biliary ducts



**Figure B:** Shows the lesion communicates with the intrahepatic bile ducts

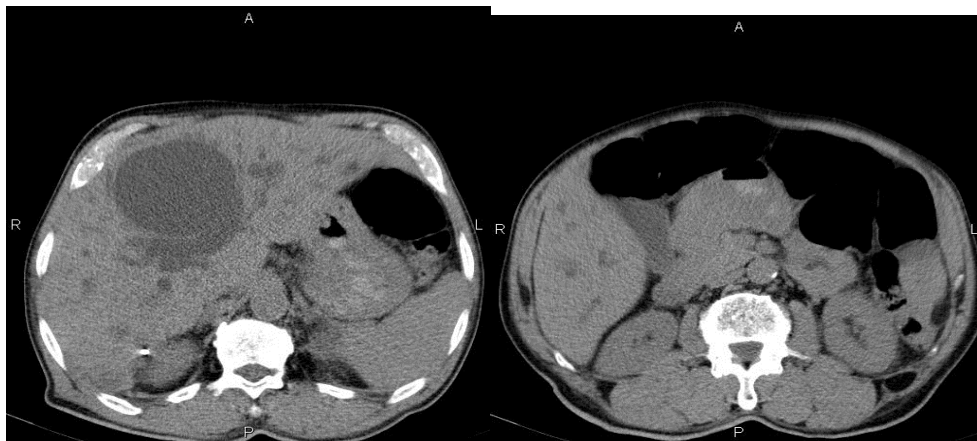


**Figure C:** Sonogram shows a normal size of gall bladder with no calculi

available. A delayed enhanced MRI examination using one of these agents may be useful to confirm that a localized fluid collection is composed of bile and to identify the site of bile leak (Melton et al 2002).

Management of bilomas may depend on the size as well as clinical presentation. In cases where bilomas are small in

diameter, a watchful waiting may be all, to confirm resolution. Treatment may take the form of surgery, endoscopic sphincterotomy, percutaneous catheter drainage, endoscopic naso-biliary drainage and endoscopic drainage (Shimada et al., 1998; Winnick et al., 2001; Izzo et al., 2001).



**Figure D:** Cross-sectional CT images of the abdomen, showing a biloma, dilated intrahepatic ducts and normal gallbladder

Percutaneous drainage is preferred for large or symptomatic bilomas, and may be augmented by a biliary drainage procedure to divert bile from the site of injury. Catheter injection often shows the site of leakage. Some patients may require percutaneous transhepatic cholangiography and percutaneous biliary drainage or ERCP to identify the site of the bile leak along with drainage to divert bile for definitive treatment (Fujiwara et al., 1998; Bas et al., 2001).

No treatment has been undertaken for the index patient at the time of presentation. The patient was taken back to the referring hospital where further management was undertaken.

### Conclusion

The presence of non-iatrogenic and atraumatic intrahepatic biloma in an immune-compromised patient is a rare finding. The patho-physiology of spontaneous rupture of a biliary tract, with bile leakage and encapsulation remain unclear. The clinical picture may often be non-specific and mirror several other pathologies.

Abdominal Ultrasound with Contrast CT correlation has been proved to be reliable diagnostic tools in the initial diagnosis as well as follow-up after intervention.

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