

The Correlation of Inadequate Liver Abscess Drainage and Biliary Bronchopleural Fistulas

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Introduction

Biliary bronchopleural fistulas (BBPF) are an uncommon yet serious complication after penetrating injury to the thoraco-abdominal region. Biliary bronchopleural fistula can present either as a fistulous connection between the biliary system and the pleura, biliary system and the bronchus or an abscess cavity draining directly into the bronchopleural space¹. Although our case of a 43-year-old man sustaining a traumatic liver laceration may initially not be unique in terms of etiology and pathology, the presentation of our patient is novel in regards to mechanism of injury (i.e. blunt trauma) and in the timing or delay in presentation of symptoms. The patient described within this case study did not exhibit any evidence of injury to the right diaphragm and subsequently there was no reason to suspect a fistulous connection. In this particular patient the traumatic BBPF was not a direct result of the trauma but rather was a result of inadequate drainage of a liver abscess.

Key Words: Bile ducts, Biliary bronchopleural fistula, Biliotypsis, Interventional Radiology, Laparoscopy, Liquefactive necrosis, Thoracotomy.

Case Report

A 43-year-old man initially presented with injuries after landing on his right side from falling 15 feet to the ground. Initial radiographs revealed multiple fractures to his ribs, pelvis, and right upper extremity. A CT scan identified a posterior liver laceration with a blush. The liver lesion was embolized by Interventional Radiology (IR) using Gelfoam.

A repeat CT was performed ten days after the embolization which at that time the liver was found to have findings consistent with liquefactive necrosis and a hepatic fluid collection at the site of the laceration. IR subsequently placed an 8 French pigtail catheter to drain the collection, which returned predominantly bile. The patient was then discharged with the drain in place.

Over the next four weeks, the patient presented to the outpatient clinic with complaints of recurrent right upper quadrant pain and fever. Another CT was performed, showing a persistent fluid collection in the liver. The patient was readmitted and the catheter drain was exchanged under fluoroscopy which then returned 50mL of purulent material. The patient was again discharged with the new drain in place.

Six weeks following discharge, the patient presented to the ED with fever and cough. At this time he was found to have on chest X-ray a right lower lobe pneumonia. In addition a CT of the abdomen showed the liver abscess to involve the right lower lobe of the lung. Under additional fluoroscopy, contrast was injected into the existing drainage catheter which then passed through the cavity into the pleural space and into a right lower lobe bronchus. The path of the contrast subsequently revealed the course of a fistulous tract between the liver and the lung.

Subsequently, the patient underwent an exploratory laparoscopy and right thoracotomy. The right lower lobe was found to be densely adherent to the diaphragm and the fistula tract was identified by following the pigtail catheter into the chest. We performed a non-anatomical resection of the right lower lobe and primary repair of the diaphragmatic defect. In addition, a pigtail catheter was placed intraoperatively in the hepatic defect and two chest tubes were placed in the right chest. The patient was placed on post operative IV antibiotic coverage and was discharged 8 days later.

Discussion

The trauma literature describes Biliary bronchopleural fistulas (BBPF) as a complication resulting from penetrating trauma to the liver. There are even less documented cases that describe blunt force trauma as the etiology of a BBPF. In the case of penetrating trauma, an injury to the right diaphragm usually causes a fistulous connection between the biliary system and the pleural space.^{1,2} However our patient did not have any evidence of injury to the right diaphragm and therefore no reason to suspect a fistulous connection. In our patient the traumatic BBPF was not a direct result of the trauma but a result of inadequate drainage of a liver abscess. This inadequate drainage exposed the diaphragm to infectious material and erosion of the abscess cavity into the pleural space with extension into the parenchyma and bronchus.

The management of BBPF requires an astute surgeon, the correct use of diagnostic and imaging modalities and utilization of multiple treatment options. Biliotypsis, bile stained sputum, is the hallmark of a biliary bronchopleural fistula. Once noted the healthcare provider should begin a series of diagnostic tests including a CXR and hepatobiliary imaging to help identify the fistulous tract. Conservative approaches including antibiotics and radiology guided drainage of the hepatic abscess should be initially attempted. In the case of an abnormal connection between the biliary system and the pleural space, decompression of the biliary system is an important component of managing this condition.^{3,4,5}

Failure of conservative management should lead the surgeon to seek alternate approaches for an uncommon problem. Surgical options include thoracoabdominal approaches with key components including wide drainage, debridement and repair of the diaphragm and resection of the fistulous tract through decortication or pulmonary resection.^{3,4,5}

BBPF are rare complications of hepatic pathology and trauma. The complication appears to be secondary to a missed injury to the right diaphragm or inadequate drainage of a hepatic fluid collection. Irregardless of the etiology of the BBPF a high clinical index of suspicion is needed to identify the problem and a wide variety of non-operative and operative methods are needed to resolve the problem.²

References

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