CASE REPORT

Fungal liver abscess in an immunocompetent patient who underwent repeated ERCPs and subtotal cholecystectomy

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SUMMARY

We report a case of a previously healthy female patient who initially presented with fever, jaundice and right upper quadrant pain three days after dilatation and stenting of a stricture of the common bile duct (CBD). During an earlier admission, the patient had undergone endoscopic retrograde cholangiopancreatography (ERCP) having presented with fevers and biliary dilatation on ultrasound. The ERCP features were more consistent with Mirizzi's Syndrome. The patient subsequently underwent subtotal cholecystectomy and later developed a CBD stricture, requiring repeat ERCP and stent insertion. At presentation, she had moderately deranged liver function tests and significantly elevated inflammatory markers and was found on cross-sectional imaging to have developed a liver abscess. Aspiration of the lesion cultured *Candida albicans*. She was treated with intravenous antifungals, broad-spectrum antibiotics and further aspiration of abscess, which contributed towards her successful recovery. Fungal liver abscess should be suspected in immunocompetent patients who undergo ERCP and or cholecystectomy.

BACKGROUND

Liver abscess is a potentially fatal condition with a mortality rate of 2%–12%.¹ This case emphasises the possibility of fungal liver abscess after endoscopic retrograde cholangiopancreatography (ERCP) or cholecystectomy, even in an immunocompetent individual. Clinicians should be aware of this complication, so that the patient can be diagnosed and managed appropriately.

CASE PRESENTATION

A 31-year-old woman presented with one month's history of worsening right upper quadrant (RUQ) pain and jaundice associated with vomiting and pruritus. She had travelled to Africa (Ghana) two weeks prior and her symptoms had worsened during that trip. Blood tests revealed elevated bilirubin (192 µmol/L), alkaline phosphatase (ALP) (199 u/L) and alanine transaminase (ALT) (791 u/L). Ultrasound abdomen revealed multiple gallbladder calculi including several stones within the cystic duct and a moderately thickened gallbladder wall. The common bile duct (CBD) was mildly dilated at 10 mm.

She was initially managed with broad-spectrum antibiotics and underwent ERCP on the fifth day

post admission, which showed features classical for Mirizzi's Syndrome, with an unobstructed CBD and dilated intrahepatic ducts. Calculi were noted opacifying the cystic duct (figure 1). Sphincterotomy was performed and the CBD was tawled, with no CBD stones identified. A prophylactic double pigtail 8 cm 7Fr biliary Teflon stent was placed across the cystic duct to ensure biliary drainage. She improved clinically, so was discharged on the eighth day post admission and underwent cholecystectomy 3 weeks later. The procedure was challenging due to the presence of ongoing local inflammation, but she made an uneventful recovery and was discharged on the fourth postoperative day.

Nine weeks later, she underwent an elective ERCP for removal of the biliary stent and re-evaluation. An unexpected finding of a distal CBD stricture was noted. Her initial biliary stent was removed. Balloon tawl resulted in significant gallstone debris extraction. As there was persistent narrowing of the distal CBD, with poor biliary drainage, another double pigtail 9 cm 7Fr Teflon biliary stent was placed. She was discharged on oral antibiotics.

Three days later, she presented with increased abdominal pain and tenderness and was re-admitted.

INVESTIGATIONS

Laboratory tests revealed a raised C-reactive protein (188 mg/L), white cell count ($15.5 \times 10^9/L$) and moderate liver function test derangement (ALP 189 u/L and ALT 199 u/L).

Her chest X-ray showed a relatively well-defined 1.8 cm lucency in the right lower zone, which was further found to be below the diaphragm on a lateral chest film (figure 2).

CT abdomen revealed a 35×33 mm hypodense lesion with irregular enhancing margins and associated gas locules in segment VIII/VII of the liver in keeping with liver abscess. There was subtle hypodensity surrounding the lesion extending to the periphery, which was thought to represent associated inflammatory changes. A biliary stent was noted to be in situ with associated aerobilia predominantly in left liver lobe, suggesting stent patency (figure 3).

DIFFERENTIAL DIAGNOSIS

Prior to the availability of cross-sectional imaging, the differential diagnosis was of cholangitis secondary to the recent instrumentation of the

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Figure 1 Endoscopic retrograde cholangiopancreatography showing stone impacted at cystic duct causing dilatation of common bile duct, intrahepatic ducts and cystic duct; features of Mirrizi's syndrome.

biliary tree or a localised perforation or collection. When the CT report became available, it was thought most likely that the patient had developed a bacterial abscess secondary to the recent biliary tree interventions. Given the history of travel to sub-Saharan Africa two weeks prior to her first admission, opportunistic and tropical infections including amoebic and hydatid infections were considered.

TREATMENT

Serology for the HIV was negative. She was initially treated with broad-spectrum intravenous antibiotics (piperacillin/tazobactam), analgesia and intravenous fluids. She underwent

ultrasound-guided aspiration of the collection, at which 10 mL bloodstained purulent fluid was aspirated, which cultured *Candida albicans*. Her antimicrobial treatment was switched to intravenous meropenem and intravenous fluconazole. However, she remained unwell and a further ultrasound-guided liver aspiration was performed at which another 10 mL purulent fluid was removed. She was switched to intravenous ertapenem, metronidazole and continued on fluconazole.

OUTCOME AND FOLLOW-UP

She improved and then she was sent home with intravenous ertapenem, oral metronidazole and oral fluconazole for four

Figure 2 Chest X-ray anteroposterior and the lateral view showing a relatively well-defined 1.8 cm lucency in the right lower zone.

Figure 3 CT abdomen axial and coronal view; post-intravenous contrast portal phase, showing 35×33 mm hypodense lesion with irregular enhancing margins and associated gas locules in segment VIII/VII of the liver in keeping with liver abscess.

weeks via the outpatient parenteral antibiotics therapy service. Follow-up imaging with a magnetic resonance scan of the liver revealed resolution of the liver abscess and no residual intra-ductal calculi or stricture (figure 4). Subsequent ERCP for stent retrieval revealed a normal calibre biliary tree with no residual gallstone debris. She remains well six months following this procedure.

DISCUSSION

Liver abscess is the most common type of visceral abscess, accounting for 48% of visceral abscesses and 13% of all intra-abdominal abscesses.² Risk factors include diabetes mellitus,

underlying hepatobiliary or pancreatic disease and liver transplant. The mortality rate ranges from 2% to 12%.¹

Abscesses may arise from surgical or penetrating wounds or from haematogenous seeding from systemic circulation.³ Another important route for liver abscess formation is direct spread of infection from the biliary tree. Underlying biliary tract disease is present in 40%–60% of cases.⁴

Most pyogenic liver abscesses are polymicrobial; mixed enteric facultative and anaerobic species are the most common pathogens. *Candida* species have also been implicated in pyogenic liver abscess. In a series of 233 patients, 22% of liver abscesses had a fungal component on culture.⁴ Hepatic infections with *Candida*

Figure 4 Endoscopic retrograde cholangiopancreatography liver coronal view showing resolution of the abscess.

species are largely restricted to patients with severe immunosuppression. Most infections are thought to spread to the liver from the gastrointestinal or biliary tract resulting in either microabscesses or macroabscesses and disseminated candidiasis.⁵

Candida species, primarily *C. albicans*, *C. glabrata* and *C. tropicalis* colonise the gastrointestinal tract in a significant proportion of normal individuals. An increase in the percentage of colonised individuals is noted among hospitalised patients. Other organs of gastrointestinal system affected by *C. albicans* are gall bladder, pancreas and peritoneum.⁶

In the current case, it is unclear whether the source of infection was the gastrointestinal or biliary tract. Given the history of intervention, the biliary tract would seem to be the most likely origin.

In a series of 123 consecutive patients undergoing ERCP, candida was found in 44% of bile samples.⁷ Although this may not always suggest a pathogenic role, candida cholangitis has been reported in patients with benign and malignant biliary obstruction.⁸

The patient demographics and risk factors for biliary tract and gallbladder candidiasis have been reviewed in a retrospective analysis of 31 cases over three years. As in other forms of candida infection, immunocompromise, diabetes and institutionalisation were implicated as risk factors.⁹

Candida can infect the peritoneum as a complication of peritoneal dialysis, gastrointestinal surgery and perforation of an abdominal viscus. Disseminated candidiasis such as hepatosplenic candidiasis and candidaemia tend to occur in immunocompromised patients and can be life threatening.⁵

Data on the management of biliary and gastrointestinal tract candidiasis is limited, but depends on the likely source and level of immunocompromise of the patient. There are reports of successful outcomes in patients who underwent cholecystectomy for isolated candidiasis of the gallbladder without antifungal therapy. Extrabiliary candidiasis, however, frequently required surgical intervention and is associated with poorer outcomes.⁹ Removal or exchange of infected biliary stents or drains should be considered.⁸

Treatment of pyogenic liver abscess is drainage and antibiotic treatment. Drainage techniques include CT-guided or ultrasound-guided percutaneous drainage, surgical drainage or drainage by ERCP. Abscesses less than 5 cm can be managed with percutaneous catheter drainage or needle aspiration.¹⁰ Single abscesses more than 5 cm can be managed with percutaneous drainage. However, in a retrospective study of 80 patients, the rate of treatment failure in patients with larger abscesses was lower in patients managed surgically (7% vs 28%).¹¹

Surgical drainage is usually preferred in cases of multiple abscesses, loculated abscesses or if inadequate response to percutaneous drainage within seven days. ERCP can be useful for drainage of liver abscesses where there is communication with the biliary tree.^{12 13}

To the best of our knowledge, fungal liver abscess following instrumentation of the biliary tree has not previously been reported in an immunocompetent individual. In a recently published case, a 32-year-old woman with known gallstones presented with abdominal pain and vomiting, a short time after ERCP and laparoscopic cholecystectomy. Imaging revealed a liver abscess measuring 62×67×65 mm. This was successfully managed with percutaneous drainage of the abscess cavity and the aspirate grew bacterial species only.¹⁴

Only two other cases of candida liver abscess in an otherwise immunocompetent patient have been described. One was a 30-year-old man with no significant medical history who presented with abdominal pain and fevers.¹⁵ In another report, candida glabrata was discovered in a 64-year-old woman who

had received multiple antibiotics and a short course of steroids for chronic obstructive airways disease, but was on no long-term immunosuppressive medication.⁵ There are no previously documented cases of candidal liver abscess following instrumentation of the biliary tree.

It is possible that this was a partially treated bacterial abscess with coincidental colonisation of the biliary tract with candida. The fact that candida was cultured on two separate occasions, and no other organism was cultured from this or any other source (this includes first set of blood cultures prior to antibiotics), makes it more likely that this was a primary candidal abscess. Moreover, to date, literature also favours treating biliary candidiasis in the context of clinical infection.⁷

It is crucial to recognise the potential of liver abscess formation after surgery or biliary tract instrumentation, as it can be a challenging clinical diagnosis to make. Visceral fungal infections are usually suspected in immunocompromised patients. However, this case highlights fungal visceral abscess in normal healthy people without dissemination to other viscera. If diagnosed in a timely manner, appropriate management can lead to a rapid recovery.

Learning points

- ▶ Liver abscess is a difficult diagnosis to be made clinically.
- ▶ Clinical index of suspicion should be high for patients with a history of biliary tract intervention who present with sepsis.
- ▶ Fungal liver abscess can occur in immunocompetent people without any predisposing risk factors.

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