

Case Report

Clonorchis sinensis: a mimic of hepatic mucinous cystic neoplasm or just a fluke?

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ABSTRACT

Liver flukes, endemic in East Asia, are parasites that can infect humans and cause liver and bile duct disease. While most infected individuals are asymptomatic, chronic infection can lead to structural hepatobiliary manifestations including hepatomegaly, intrahepatic bile duct dilatation, epithelial hyperplasia, periductal fibrosis, and potentially cholangiocarcinoma. There are no reports of human cases of liver fluke infection presenting as a hepatic cystic lesion. We present the case of a 52-year-old asymptomatic Chinese immigrant presenting with a suspected mucinous cystic neoplasm of the liver. CT and Ultrasound examinations demonstrated an enlarging complex cyst involving segments II and III. Liver function tests, hydatid serology and tumour markers were normal. He underwent elective laparoscopic left hemi-hepatectomy with liver fluke discovered on histology. Subsequent genetic testing confirmed *Clonorchis sinensis* infection. The patient made an uneventful recovery from surgery and was treated with anthelmintic therapy. This case highlights the importance of considering liver fluke as a differential diagnosis for hepatic cystic lesions in patients from endemic regions. Appropriate diagnosis could avoid surgery, whilst targeted anthelmintic therapy minimises the risk of chronic infection and associated complications, including cholangiocarcinoma.

Keywords: *Clonorchis sinensis*, Liver flukes, Endemic

INTRODUCTION

Liver flukes are parasites that can infect humans to cause liver and bile duct disease. The three main liver flukes that infect humans are *Clonorchis sinensis*, *Opisthorchis* species, and *Fasciola hepatica*, and are acquired by ingesting undercooked fish from endemic regions.¹ *Clonorchis sinensis*, which is endemic to East Asia, causes clonorchiasis and infects over 35 million people worldwide.² Although most infected individuals are asymptomatic, the risk of developing symptomatic infection increases with duration of exposure and higher worm burden, an occurrence mostly seen in older adults.³ Additionally, adult flukes can persist within the host

biliary system without tissue migration for many years, which may delay symptomatic infection following initial exposure. Acute infection typically lasts two to four weeks and is characterised by fevers, right upper quadrant pain, and gastrointestinal disturbance.⁴ Chronic infection, due to persistent epithelial irritation, can lead to structural hepatobiliary manifestations including hepatomegaly, intrahepatic bile duct dilatation, epithelial hyperplasia, periductal fibrosis, and potentially cholangiocarcinoma.³

Despite the diverse structural manifestations of chronic clonorchiasis, there have been no reported cases in the literature of liver fluke infection presenting as a hepatic cystic lesion in humans.

CASE REPORT

We present the case of a 52-year-old male who was seen in the outpatient hepatobiliary surgery clinic with an enlarging complex liver cyst. He was asymptomatic, with the lesion being found incidentally on a computed tomography (CT) scan done two years prior during an emergency department presentation for a left ureteric calculus. He was of Chinese heritage and worked as a chef handling raw fish. He had no past medical history of note, and his full blood count, liver function tests, and tumour markers were all within normal ranges. Hydatid serology and hepatic viral screen were negative.

He underwent serial multi-modal imaging which demonstrated an enlarging complex liver cyst. Dedicated CT liver multiphase scan showed an 86×60×70 mm (previously 73×53×60 mm) complex cyst in segments II-III with lobular margins and internal septations (Figure 1). There was no internal debris, biliary dilatation, or calcified gallstones. The liver had normal morphology with marked hepatic steatosis. On magnetic resonance imaging (MRI), the lesion measured 85×64×62 mm and was mostly T1 hypointense and T2 hyperintense, though displayed heterogeneity within several loculi. Again, there were multiple internal septations without any peripheral calcification, solid component, or intra-hepatic biliary ductal dilatation. Following multi-disciplinary team discussion, the lesion was deemed to be most consistent with mucinous cystic neoplasm of the liver.

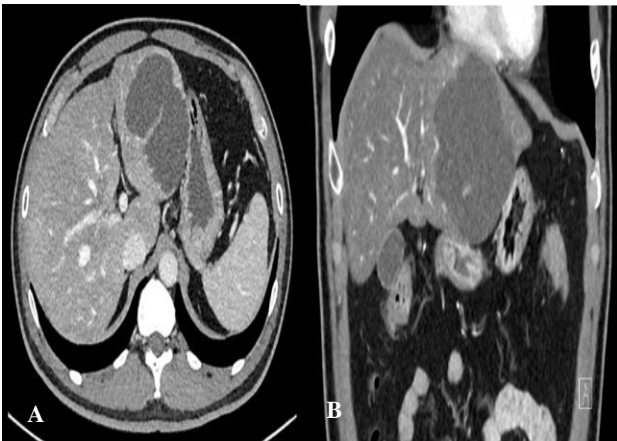


Figure 1 (A and B): Axial and coronal CT images demonstrating complex liver cyst in segments II-III.

As the lesion was growing and had high-risk features for malignant degeneration such as thickened internal septae and heterogenous MRI intensity, the decision was made with the patient to proceed with surgical management rather than ongoing observation. He proceeded to elective laparoscopic left hemi-hepatectomy and had an uneventful post-operative course, spending a one-day planned admission in the high-dependency unit, and was discharged home from hospital on post-operative day six.

Histopathological examination of the cystic spaces revealed flattened bland biliary type epithelium containing parasitic organism in keeping with liver fluke (Figure 2). There was periductal stromal fibrosis and foci with hyperplastic biliary glands. The liver parenchyma showed severe steatosis without evidence of cirrhosis or malignancy. Tissue sample underwent formalin-fixed paraffin-embedded extraction, with subsequent polymerase chain reaction (PCR) molecular testing confirming a 99% match (442/444 base pairs) with *Clonorchis sinensis* on GenBank.

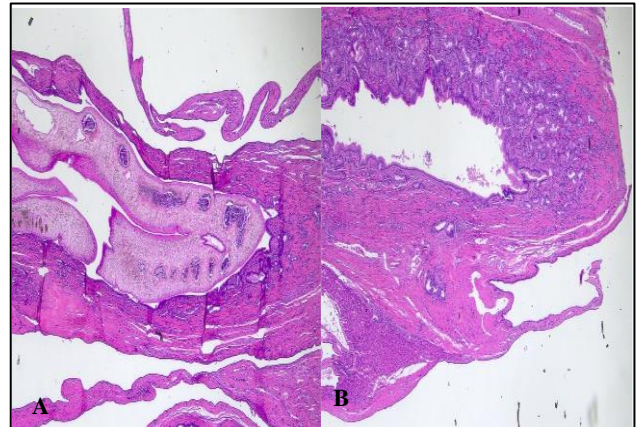


Figure 2 (A and B): Histopathological slides showing liver fluke and biliary epithelial hyperplasia.

He was treated with anthelmintic agent praziquantel and successful eradication with negative stool OCP was confirmed. Family members were offered stool OCP screening, and upon returning to work as a chef, he was advised to maintain good hand hygiene practices and to avoid eating raw seafood, as this was the likely source of his liver fluke.

DISCUSSION

Clonorchis sinensis is a liver fluke endemic to East Asia that can cause liver and bile duct disease. The lifecycle of the parasite begins with the release of embryonated eggs from the mammalian host stool.⁵ These eggs are then ingested by a snail which acts as the first intermediate host, in which released miracidia undergo several developmental stages to become cercariae. The cercariae are released into water and penetrate the flesh of freshwater fish such as carp or salmon, the second intermediate host, where they encyst as metacercariae. Infection in humans and other carnivorous mammalian reservoir hosts such as cats occurs by ingestion of undercooked fish. The metacercariae excyst in the host duodenum and ascend the biliary tract through the ampulla of Vater. Maturation to adult flukes takes approximately one month and they can persist for many years while releasing embryonated eggs into the stool via biliary ducts to perpetuate the lifecycle.⁵

The pathogenesis of biliary injury is related to migration and habitation of liver fluke within intra- and extra-hepatic bile ducts. Trauma to biliary epithelium causes ulceration and desquamation, and results in typical pathological findings of periductal fibrosis, epithelial hyperplasia and glandular metaplasia.⁶ Chronic infection can lead to clinical manifestations beyond acute phase infection such as biliary obstruction, stone formation, cholecystitis, cholangitis, hepatitis, and cirrhosis.⁷ Structural changes include hepatomegaly, biliary ductal dilatation, and stricture formation.⁸ Liver fluke infection is also associated with an increased risk of cholangiocarcinoma due to chronic epithelial irritation. A meta-analysis from 2012 including 181 studies and 56 million patients found the odds ratio for cholangiocarcinoma with clonorchiasis was 6.1 (95% CI 4.3-8.7), representing the major cause of mortality from fluke infection.⁹

The most common imaging finding is diffuse dilatation and thickening of small intra-hepatic bile ducts without focal obstruction.¹⁰ Other imaging findings are related to the structural manifestations of clonorchiasis and may show fibrosis, calcification, or hyperplasia.¹¹ The flukes are not usually visible themselves due to their small size, unless directly visualised with endoscopic retrograde cholangiopancreatography.¹⁰ There have been no reported cases in the literature of liver fluke infection presenting as a hepatic cystic lesion in humans. Interestingly, complex cystic liver manifestations of liver fluke infection have been described in domestic cat on multiple occasions.¹²⁻¹³

In patients with relevant epidemiologic exposure, diagnosis of clonorchiasis is most easily achieved by egg identification on stool microscopy, typically detectable four weeks following infection. Urine antigen testing is an emerging diagnostic tool, displaying greater sensitivity than stool microscopy, and has also been proposed as a screening tool in endemic regions.¹⁴ Serologic testing using enzyme-linked immunosorbent assay and molecular testing with PCR, as was used in this case, have also been developed but are not widely available at present.¹⁵ Treatment aims to manage acute symptoms if present, as well as prevent chronic infection and associated complications. Anthelmintic therapy with praziquantel is the most widely used, but there are alternative agents such as albendazole and tribendimidine.¹⁶ Though eggs typically disappear from the stool within a week of treatment, symptoms may take longer to resolve, and structural manifestations can persist after treatment.

CONCLUSION

This case highlights the importance of considering liver fluke infection as a differential diagnosis for hepatic cystic lesions in patients from endemic regions. Appropriate diagnosis could avoid surgery, whilst targeted anthelmintic therapy minimises the risk of

chronic infection and associated complications, including cholangiocarcinoma.

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