

# Mimicry of acute cholecystitis from Wilson's disease

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## ABSTRACT

We present a 33-year-old Chinese woman with Wilson's disease in whom ultrasonography and computed tomography showed gallbladder features suggestive of acute cholecystitis. Incongruence in liver function prompted further investigations with the final diagnosis of Wilson's disease, complicated by oedema of the gallbladder mimicking acute cholecystitis. The patient was subsequently treated nonoperatively, and is well on follow-up.

**Keywords:** cholecystitis, gallbladder disease, Wilson's disease

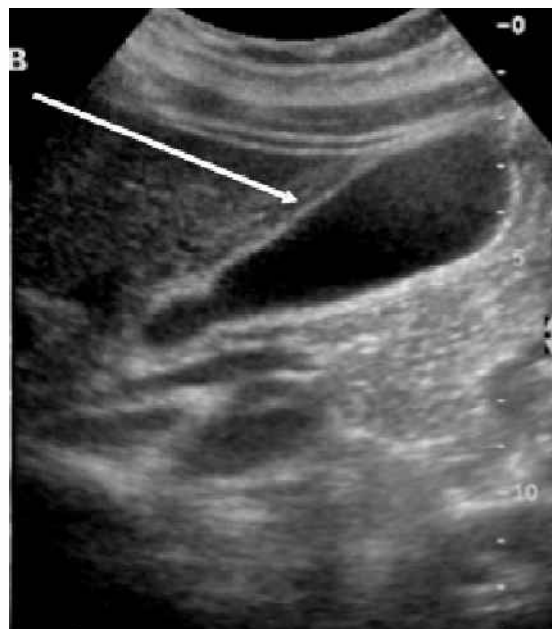
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## INTRODUCTION

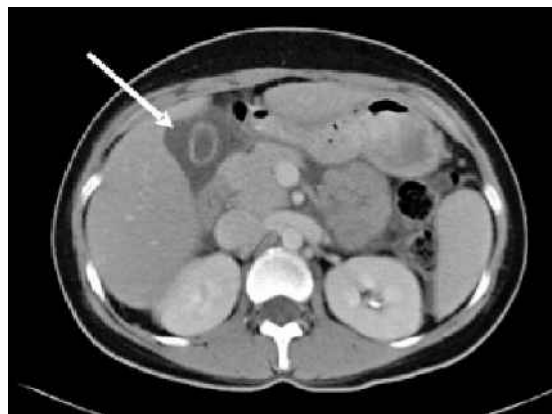
Acute cholecystitis classically presents with right upper quadrant pain, and a positive Murphy's sign secondary to the inflamed gallbladder wall. Radiological findings, such as a thickened gallbladder wall with gallbladder calculi and ultrasonographical Murphy's, are helpful to support the clinical suspicion, but are non-specific.<sup>(1)</sup>

## CASE REPORT

A 33-year-old Chinese woman presented with a three-week history of painless jaundice and low grade fever. White cell count was elevated to  $20 \times 10^9$  g/L, and direct bilirubin was elevated at 161 U/L. Liver ultrasonography (US) showed a thick-walled gallbladder (Fig. 1). The biliary tree was not dilated. Viral hepatitis and autoimmune markers were negative. Despite empirical intravenous antibiotics, her sepsis progressed with haemolysis (haemoglobin decreased from 10 to 5.8 g/L) and disseminated intravascular coagulopathy (DIC) (prothrombin time [PT] 25.9 sec, activated partial thrombin time 55 sec). Leptospirosis, dengue serology and malaria blood films were negative. Computed tomography (CT) showed a normal appearing liver with a thick-walled gallbladder (Fig. 2). The spleen and pancreas appeared normal. The presumptive diagnosis was severe sepsis from cholecystitis. She was started on doxycycline and metronidazole for atypical bacteria coverage. Blood cultures were negative but she responded clinically and was discharged well with a view to an interval cholecystectomy.



**Fig. 1** US image of the abdomen shows an oedematous gallbladder wall (arrow).



**Fig. 2** Initial CT image of the abdomen shows an oedematous gallbladder wall (arrow).

Subsequent liver US a month later showed a thick-walled gallbladder with a few gallstones and mild splenomegaly (12.6 cm) (Fig. 3). The impression was chronic cholecystitis. Prior to the scheduled interval cholecystectomy, she re-presented with anorexia, obstructive jaundice and positive Murphy's sign. As the clinical impression was acute-on-chronic cholecystitis with possible cholangitis, she was started on intravenous imipenem. Total white cell count was  $8.3 \times 10^9$ /L, direct bilirubin 103  $\mu$ mol/L, indirect bilirubin

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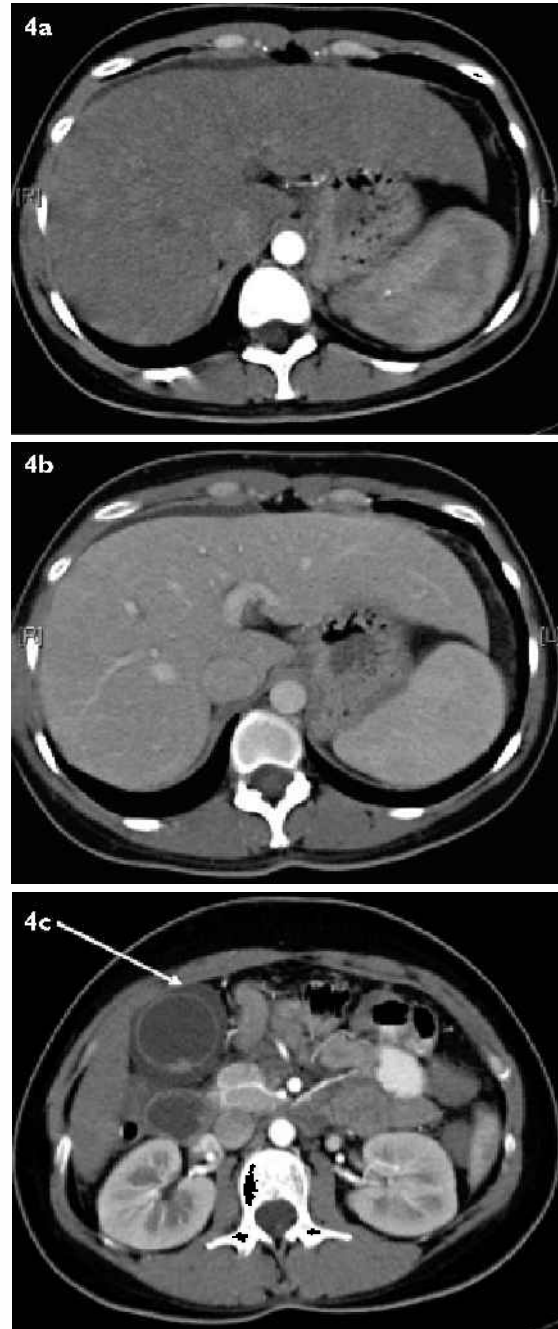
**Fig. 3** Second US image of the abdomen shows a thickened gallbladder wall with gallstones (arrow).

67  $\mu\text{mol/L}$ , aspartate transaminase 105  $\mu\text{mol/L}$ , alanine transaminase 55  $\mu\text{mol/L}$ , and alkaline phosphatase 145  $\mu\text{mol/L}$ . Notably, her serum albumin was 27 g/L and PT continued to be prolonged at 21.6 sec. CT revealed heterogeneous enhancement of the liver in the arterial phase, with multiple enhancing nodular areas (Figs. 4a & b). Diffuse thickening of the gallbladder wall was again noted (Fig. 4c). Magnetic resonance cholangiopancreatography showed normal biliary architecture and moderately distended gallbladder with gallstones and surrounding fluid, suggestive of acute cholecystitis (Fig. 5).

In view of possible liver parenchymal pathology, further tests were conducted, including for caeruloplasmin, which was low (at 10 mg/dL), and ophthalmologist screening, which noted Kayser-Fleischer rings on slit-lamp examination. The final diagnosis of Wilson's disease was made when the 24-hour urinary copper level was found to be high (24  $\mu\text{mol/day}$ ). On further history-taking, consanguinity was discovered as the patient's parents were cousins. Genetic screening for her brother was then scheduled. The patient was started on penicillamine and zinc. On follow-up, the patient's right hypochondria pain had resolved.

## DISCUSSION

Acute cholecystitis is a common condition and occasionally presents fulminantly with DIC. In the majority of patients, diagnosis is easily made with clinical and radiological findings. US remains the investigation of choice due to its non-invasiveness and availability. However, positive findings of gallbladder wall thickening, gallbladder calculi, positive ultrasonographical Murphy's sign and pericholecystic fluid can only give a specificity and sensitivity of 53% and 93%, respectively.<sup>(2,3)</sup> US is also very much operator-dependent, and as such, stones in the gallbladder may



**Fig. 4** Interval CT images of the abdomen show nodular enhancement of the liver in the (a) arterial and (b) portovenous phases. (c) Interval CT image shows an oedematous gallbladder wall (arrow).

occasionally not be demonstrated. Gallbladder wall thickening, although thought to be more specific to gallbladder pathology, has also been described in non-biliary disorders such as ascites, chronic renal failure and congestive cardiac failure.<sup>(2)</sup> CT may also help in the diagnosis of acute cholecystitis, especially of the acalculous variety, where pericholecystic fluid collection is better detected.<sup>(3)</sup> It is, however, well known that small stones are often missed in CT because the distances between individual frames of the



**Fig. 5** Axial T1-W MR image of the liver shows an oedematous gallbladder wall (white arrow) and filling defects in the gallbladder (black arrow).

image may be wider than the size of the stones. Also, the differences in spatial resolution, partial volume artefacts, and poor visualisation of non-calcified stones which may appear isodense with bile, contribute to the limitation of CT.

In this patient, cholecystectomy was initially thought to be the “easy treatment” for her repeated attacks of “cholecystitis”. However, the laboratory findings of cholestatic jaundice and chronic liver insufficiency as well as the CT findings of heterogeneous enhancing lesions with splenomegaly prompted further investigation. The diagnosis of Wilson’s disease in the tropics is often delayed.<sup>(4)</sup> While neuropsychiatric or extrapyramidal manifestations are often thought to be the presenting feature in the young, haemolysis has often been described as well.<sup>(5)</sup> To date, no association between Wilson’s disease and acute cholecystitis has

been described. Patients with Wilson’s disease are more prone to gallstone formation,<sup>(6)</sup> owing to increased intravascular haemolysis.

Although it is very unlikely, there is still a possibility that the patient did in fact have acute cholecystitis together with an acute flare of Wilson’s disease. However, this is difficult to disprove without the gallbladder specimen for bacterial culture. Given that the patient has since not returned with similar symptoms, the radiological feature of cholecystitis in this patient was more likely to have been a mimicry of acute cholecystitis, secondary to Wilson’s disease. Although Wilson’s disease is associated with hepatitis and cirrhosis, it has never been reported to be associated with such sub-acute presentation. Early diagnosis of Wilson’s disease is crucial for early treatment in order to avoid unnecessary injury to the liver.

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