Obstructive jaundice induced by biliary ascariasis

Aine Keating,¹ James Aidan Quigley,¹ Al Frederick Genterola²

¹Norwich Medical School, University of East Anglia, Norwich, UK

²Department of General Surgery, Corazon Locsin Montelibano Memorial Regional Hospital, Bacolod City, Philippines

Correspondence to

Aine Keating,
a.keating@uea.ac.uk

SUMMARY

Ascaris lumbricoides is one of the most prevalent parasitic infections, especially in developing countries. Its presence can lead to a multitude of presentations, one of the rarer ones being obstructive jaundice due to migration of the worm in to the biliary tree. We describe a case of a man who presented as an emergency to the general surgeons complaining of abdominal pain, fever, jaundice and vomiting. Ultrasound was used and the diagnosis of biliary ascariasis was made. The patient underwent surgery consisting of a cholecystectomy, common bile duct exploration and T-tube choledochostomy. Our report highlights the varied aetiology of obstructive jaundice and the importance of including biliary ascariasis in the differential diagnosis of the jaundiced patient, especially from endemic areas.

BACKGROUND

Ascaris lumbricoides is a nematode roundworm that is the commonest helminthic infection worldwide and is responsible for approximately 60 000 deaths each year.¹ The disease is most prevalent in tropical and subtropical developing countries, mainly due to poor sanitation and public health measures which encourage transmission and infection between poor populations.² Ascariasis infection is uncommon in the developed world, and most medical students and doctors in the UK are likely to be only vaguely familiar with the infection. Indeed, tropical infectious diseases often do not receive much lecture time on the medical curriculum owing to an already overburdened teaching schedule. However, with increasing affluence allowing more travel, increased rates of migration and most UK medical students undertaking electives in ascariasis endemic areas, it is more important than ever for clinicians and students alike to be familiar with the symptoms, diagnosis and treatment of ascariasis infection.³

CASE PRESENTATION

A 42-year-old unemployed man attended the emergency department complaining of a 3-day history of right-upper-quadrant abdominal pain. He also complained of a swinging fever, nausea and vomiting. The patient was visibly jaundiced at presentation. On further enquiry, the patient denied any weight loss, anorexia, pruritus or change in stools.

Interestingly, the patient had had a cholecystostomy tube inserted in April 2010 as treatment for cholangitis but self-discharged against advice and was lost to follow-up (he reported he removed the tube himself).

Family history was unremarkable and the patient was taking no regular medication and reported no allergies. On asking about his lifestyle, he reported that he consumed 3–9 units of alcohol per week, a 15 pack-year history and was single.

On initial observation, the patient was obviously jaundiced. Further examination revealed that his vital signs were unremarkable except for a mild hypotension (with a blood pressure reading of 90/70 mm Hg). Abdominal palpation revealed a soft abdomen with no masses but tenderness in the right upper quadrant and a positive Murphy's sign. There was nothing to note on the rest of the examination.

INVESTIGATIONS

Blood tests were conducted which revealed little other than a leucocytosis ($15.3 \times 10^9/l$) with a neutrophilia of 89%. Other results of interest include a reduced albumin (2.7 g/dl) and a slight hypokalaemia (3.3 meQ/l).

The most significant results, however, were with regards to bilirubin levels. Total bilirubin was elevated at 5.81 mg/dl; indirect bilirubin was raised slightly (0.92 mg/dl) and direct bilirubin was raised markedly (4.88 mg/dl).

Serum amylase was normal, and in conjunction with an ultrasound showing no pancreatic pathology, we ruled out pancreatitis.

Imaging was carried out via ultrasound which provided the definitive diagnosis. The report stated that there was choledocholithiasis with common bile duct (CBD) ascariasis and dilated intrahepatics with diameters exceeding the average of 2 mm. No intra-hepatic stones were visualised. The CBD measured 1.5 cm and the gallbladder was contracted with no stones seen.

DIFFERENTIAL DIAGNOSIS

Based on the history, and bearing in mind the patient's social status, our differential included viral hepatitis, alcoholic hepatitis, cholangiocarcinoma, CBD stone, cancer of the head of the pancreas, carcinoma of the ampulla of Vater, pancreatitis and cancer of the gallbladder.

Viral serology testing ruled out infective hepatitis as a cause. Based on the patient's social history and normal aspartate transaminase (AST) and alanine transaminase (ALT) levels, we concluded alcoholic hepatitis was a less likely cause. Cholangiocarcinoma remained a possible cause as endoscopic retrograde cholangiopancreatography (ERCP) facilities were unavailable at the hospital to rule it out for certain and was only excluded during surgery. CT scanning was not undertaken for this patient owing to financial reasons which meant the only imaging modality to exclude differentials was ultrasound. This was not ideal as the limitations of this modality means it is often difficult to visualise the pancreas to rule out pathology. This was an interesting lesson to the authors who are both accustomed to optimum investigations being undertaken in National Health Service (NHS) hospitals. The surgeons advised that malignancy was unlikely owing to the absence of

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weight loss and the acute nature of the presentation; however, this was only definitely ruled out at surgery.

Considering we were on our elective in a developing country where ascariis is endemic and under the guidance of the general surgery team, we added biliary ascariasis to our differential.

Importantly, this highlights the necessity of considering causes of obstructive jaundice that are rare in the UK (and which we have not encountered before) but common in the Philippines.

TREATMENT

Patients with ascariasis infection are usually treated medically with antihelminthic agents to prevent complications such as biliary ascariasis arising. Unfortunately, this does not always occur in poorer countries where access to healthcare is more limited.

Biliary ascariasis is usually managed conservatively: the patient is kept nil by mouth until spontaneous resolution of symptoms. However, when the patient is failing to improve, surgical exploration is often undertaken. In our case, after several days of observation with no resolution, the surgeons opted for this approach. The patient underwent surgery 3 days later (the delay being due to prioritisation of more urgent cases).

A cholecystectomy was performed (see figures 1 and 2) followed by common bile duct exploration. Examination of the duct allowed extraction of an ascariis carcass, a live ascariis and pigment stones (figure 3). A T-tube cholecystostomy was also performed. The patient received a single dose of mebendazole following the procedure. De-worming is done after extraction, or after spontaneous resolution of symptoms, to prevent the death of the worm in the duct. The T-tube cholecystostomy remains in place until the patient is stabilised and successfully de-wormed.

OUTCOME AND FOLLOW-UP

On reviewing the patient, 5 days postoperatively, he is improving though still mildly jaundice. A cholangiogram undertaken 6 days postoperatively unfortunately showed a filling defect consistent with continuing ascariasis infection. The plan is to adopt a conservative approach for the time being, treating the patient with mebendazole and repeating the cholangiogram in 4 weeks time.

DISCUSSION

A. lumbricoides is a common helminthic infection of the intestines in humans. A literature search by the authors on PubMed revealed 187 case reports, mostly from countries defined as

Figure 2 Gallbladder following Cholecystectomy (image 6695).

‘Third World’. This is no surprise as the infection is most commonly seen in the developing nations where ineffective sanitation, inadequate public health measures and poor hygiene contribute to the spread of infection through local communities.⁴ The parasite is interesting in that its life cycle undergoes completion in the lungs and intestines before the worm eventually resides as an adult in the jejunum. They are capable of living up to 2 years and have an average length of 10–20 cm (although the largest can reach 40 cm in length).⁵ Adult worms produce nearly a quarter of a million eggs per day once they reach full maturity.¹

Intestinal ascariasis predisposes to the development of biliary ascariis whereby the worm passes through the ampulla of Vater in to the biliary tree causing an obstruction causing biliary colic, acute cholecystitis or pancreatitis.⁵ In most cases, the worm passes back in to the duodenum spontaneously allowing resolution of symptoms within 24–36 h.⁶ However, in some cases, the worm can induce chemical irritation leading to cholangitis as well as secondary bacterial infection which, in the worst cases, can lead to liver necrosis and abscess formation as well as perforation of the common bile duct.⁷

The diagnosis of biliary ascariasis can be a difficult one. Clinical signs that are suggestive include biliary colic with vomiting of worms or positive stool or vomit samples for worms or their ova. Imaging in the form of ultrasound showing characteristic signs (eg, Stripe sign, Inner tube sign or Spaghetti sign)⁷ or

Figure 1 Intraoperative picture of procedure. White arrow points to the common bile duct (CBD). (edited image).

Figure 3 Live ascariis and two ascariis carcasses removed from the common bile duct (image 6697).

a cholangiogram demonstrating a filling defect in conjunction with clinical symptoms can be diagnostic.^{5 8}

Oriental cholangitis presents similarly to biliary ascariasis. Charcot's triad of fever, abdominal pain and jaundice are seen in both conditions and warrants consideration in patients presenting with biliary ascariasis.⁹ The commonest cause of cholestatic jaundice in developing countries is choledocolithiasis. In our case, it is difficult to know whether the event was triggered solely by stones with incidental ascariasis found at surgery, or by biliary ascariasis predisposing to the formation of these stones. As the extracted stones were pigment stones which are typically predisposed to by biliary ascariasis, it seems the latter explanation is more plausible.¹⁰

Medical treatment of ascariasis usually involves the use of an anti-helminthic agent, for example, mebendazole. Ideally a stool sample should be repeated 2 weeks after starting the medication to confirm successful treatment. In biliary ascariasis, medical treatment should be delayed until the worms spontaneously exit the biliary tree and re-enter the duodenum. This is because if treatment is given while the worm is still present in the biliary tree, its death and subsequent carcass can lead to further complications. Failure of conservative treatment or an acutely unwell patient warrants intervention by ERCP or open surgery (dependent upon the facilities available).⁷

However, the fundamental point remains that, without improvements in sanitation and adequate education on improved hygiene practices, re-infection of successfully treated patients is highly probable and the cycle of transmission and infection is unlikely to be broken.^{1 5 7}

Competing interests None.

Patient consent Obtained.

REFERENCES

- 1 World Health Organization. *Water related diseases: Ascaris*. http://www.who.int/water_sanitation_health/diseases/ascariasis/en/ (accessed 18 Jul 2012) First published 2001.
- 2 Galzerano A, Sabatini E, Duri D. Ascaris lumbricoides infection: an unexpected cause of pancreatitis in a western Mediterranean country. *East Mediterr Health J* 2010;16:350–1.
- 3 Misra SP, Dwivedi M. Clinical features and management of biliary ascariasis in a non-endemic area. *Postgrad Med J* 2000;76:29–32.
- 4 Khan AB, Bhasin SK, Bhagat RK, et al. An unusual presentation of biliary ascariasis. *JK Science* 2007;9:35–6.
- 5 Geller DA, Goss JA, Tsung A. *Schwartz's principles of surgery: chapter 3- liver*. 1117 (Ninth edition published 2010, first published 1969) New York:McGraw-Hill Medical.
- 6 Mahmoud AF. Intestinal nematodes (Round worms). In: Mandell GL, ed. *Mandell, Douglas and Bennett's principles and practice of infectious diseases*. Philadelphia: Churchill Livingstone, 2000:2940–1.
- 7 Shah OJ, Zargar SA, Robbani I. Biliary ascariasis. A review. *World J Surg* 2006;30:1500–6.
- 8 Ferreyra NP, Cerri GG. Ascariasis of the alimentary tract, liver, pancreas and biliary system: its diagnosis by ultrasonography. *Hepatogastroenterology* 1998;45:932–7.
- 9 Frossard JL, Bonvin F. Charcot's triad. *Int J Emerg Med* 2011;27:4–18.
- 10 Tazuma S. Epidemiology, pathogenesis and classification of biliary stones (common bile duct and intrahepatic). *Best Pract Res Clin Gastroenterol* 2006;20:1075–83.

Learning points

- ▶ Biliary ascariasis is an important differential diagnosis to consider in patients with obstructive jaundice who are from endemic areas.
- ▶ Medical students from the UK should familiarise themselves with common helminthic infections and their possible complications prior to undertaking their electives in endemic countries.
- ▶ Easily treatable infections in the UK can present with more serious complications in developing countries due to late presentation, inadequate public health measures and fewer resources.
- ▶ Eradication of ascariasis infection in developing countries is only possible with improved sanitation and public health measures.

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