

Helminth-induced Pancreatitis: Case Report and Literature Review

ABSTRACT

Hepatobiliary and pancreatic ascariasis is a rare cause of pancreatitis in the Western World, with only individual cases reported. We present the case of a 24-year-old man who presented with a 3-month history of recurrent abdominal and back pain, bloating, nausea, anorexia and cachexia. Pancreatitis was confirmed with blood investigations and CT scan. No causative factors were identified on abdominal US, MR cholangiopancreatography or endoscopic US. The patient claimed to notice worm fragments in his feces three months after initial presentation. Fecal analysis confirmed the presence of helminth fragments, suggesting hepatobiliary and pancreatic ascariasis despite lack of travel to endemic regions. The patient was treated with mebendazole 100 mg bid for 3 days which resolved his symptoms completely. He remained well at 12-month follow-up. Fecal analysis should be considered in patients with pancreatitis of unknown etiology.

BACKGROUND

Pancreatitis is defined as an inflammation of the pancreatic parenchyma and can be divided into acute and chronic forms. Acute pancreatitis usually results in severe abdominal pain, elevated serum amylase or lipase, and a systemic inflammatory response (SIRS). Acute pancreatitis may be mild or severe and may cause local complications and/or organ dysfunction. The mortality of this disease can be as high as 20-50% in severe illness.¹

In the Western world, alcohol and gallstones are the most common causes of acute pancreatitis. In contrast, hepatobiliary and pancreatic ascariasis (HPA) is common in Asia, Africa and South America where ascariasis is endemic, accounting for up to 23% of cases and is second only to cholelithiasis as a cause for pancreatitis.² The mean age for HPA is 35 years. HPA affects females more than males at a ratio of 3:1.³

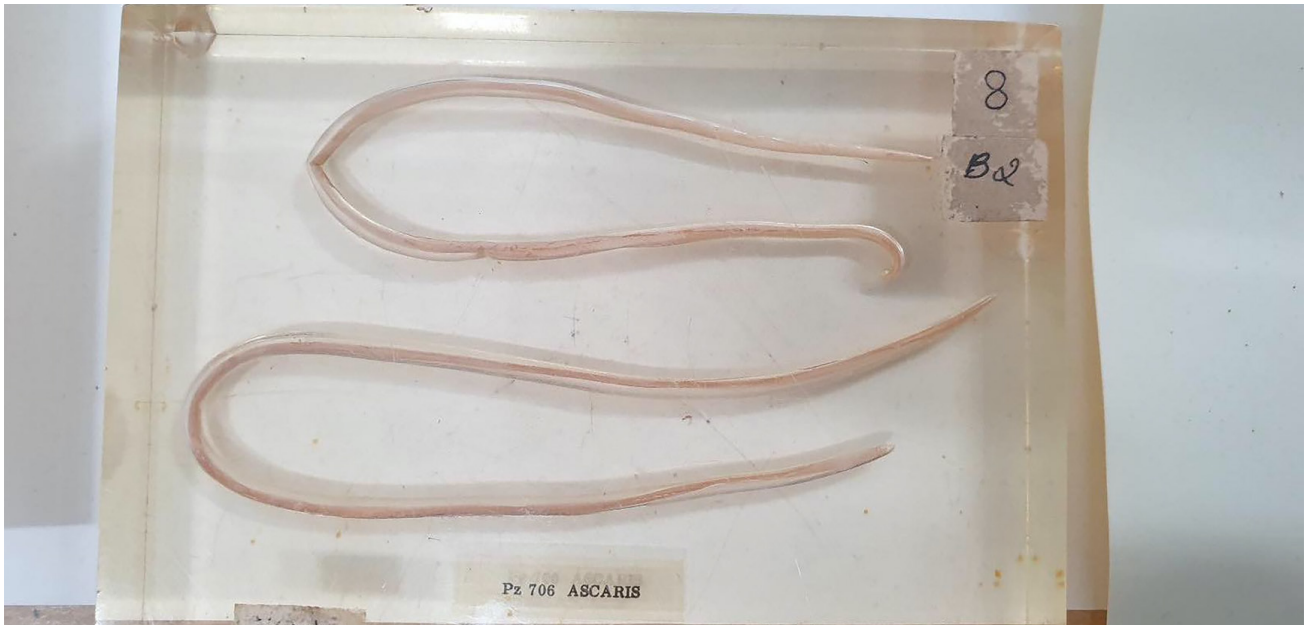
CASE PRESENTATION

A previously healthy 24-year-old male presented at the A&E department at MDH with a 3-month history of recurrent episodes of abdominal and back pain, bloating, nausea, anorexia and cachexia. He denied alcohol use, recent exotic travel abroad, recent abdominal trauma and any medicinal/recreational drug intake. He could not identify a particular trigger for the symptoms or a specific event preceding the onset of symptoms. He was a Maltese national who worked as a chef in a restaurant.

INVESTIGATIONS

On presentation to the Accident & Emergency department, the patient was afebrile and hemodynamically normal. His serum amylase peaked at 206 U/l and the serum lipase was 120 U/l, confirming acute pancreatitis. The patient's full blood count, renal and liver profiles, serum calcium, lipid profile and serum IgG-4 were all normal. A CT scan of the abdomen and pelvis identified minimal peri-pancreatic fat stranding. The US excluded gallstones as a cause. Follow-up MR pancreas with MR cholangiopancreatography (MRCP) was normal. Bilio-pancreatic endoscopic US (EUS) was likewise normal; there was no dilatation of the pancreatic duct. At this stage, the causative factor was still unidentified and it was decided to run a fecal calprotectin which returned an elevated value of 1820 µg/g. A Colonoscopy and ileoscopy, and stool analysis for ova and parasites were however, entirely normal. Despite all of these advanced diagnostic tests returning normal results, his hyperamylasemia and episodic abdominal pain went on unabated. He was discharged home once he was clinically well; his symptoms resolved with IV fluid hydration and simple analgesia. However, the cause for the patient's pancreatitis was not yet established. This dilemma ended when 2 months after presentation, the patient noted parts of a worm in his faeces and upon stool analysis of said worm, *Ascaris lumbricoides* worm was identified.

Figure 1. *Ascaris lumbricoides* worm (Source: University of Malta, Biology Department).



TREATMENT

Endoscopic retrograde cholangiopancreatography (ERCP) may be a therapeutic tool for HPA-induced pancreatitis. However, the need for this may be avoided by giving anti-helminthic drugs which paralyse the roundworm, which will eventually be expelled by the peristaltic activity of the intestines.⁴ These drugs include mebendazole, albendazole and ivermectin.⁵ If symptoms persist up to 3 weeks post anti-helminthic therapy, ERCP for retrieval of dead *Ascaris* products is suggested.⁶ The patient was treated with mebendazole 100 mg bid for 3 days. This resolved his symptoms completely and he remained well 12 months after this treatment.

OUTCOME AND FOLLOW-UP

The patient was followed up at outpatients at regular intervals. He remained well 12 months after treatment with anti-helminthic drugs. Follow-up blood tests showed resolution of all deranged enzymes. Fecal calprotectin decreased to normal values. Repeat imaging was not performed. The patient has been asymptomatic since finishing his course of mebendazole.

DISCUSSION

Our suspicion is that this patient contracted the *Ascaris* worm because of poor food hygiene practices, whilst handling contaminated food during his work as chef. *Ascaris lumbricoides* is a soil-transmitted roundworm. The adult female worms produce thousands of eggs

daily that are passed in feces and, if conditions allow, deposited in soil. Once in soil, infective larvae of *Ascaris* develop in the eggs and, if ingested by a human host, hatch and develop into adult worms over several months.

Pancreatitis secondary to HPA is thought to arise from obstruction of the common bile duct or the pancreatic duct by the head of the adult roundworm.⁷ This would explain why, even though ascariasis is common in children, pancreatitis secondary to HPA is not, since the ampulla is too small for the roundworm to enter and eventually obstruct. The ampulla is where the pancreatic duct and bile duct merge to drain into the duodenum. This theory also accounts for the reason why HPA pancreatitis is a complication of biliary surgery such as cholecystectomy or ERCP for gallstone disease. The intervention is thought to facilitate worm invasion since these procedures widen the ampullary orifice and lead to easier passage of worms into the bile ducts.

Nearly all patients with *Ascaris*-related pancreatitis present with abdominal pain, and many also report back pain, nausea, vomiting, and worm emesis. These symptoms, in addition to a serum amylase which is approximately 3 times the upper limit of normal, are diagnostic for acute pancreatitis. Imaging studies, such as abdominal US and Abdominal CT will demonstrate a dilated pancreatic duct in patients with HPA pancreatitis. HPA radiologic findings are very nonspecific however bile duct dilatation is seen on CT and MRI.³

EUS may also be used to visualize the *Ascaris* roundworm.⁸ Further investigation with MRCP should also describe a dilated pancreatic duct, as well as peripancreatic oedema and a smooth linear filling defect. However, in our case both EUS and MRCP were normal. The gold standard of a diagnosis of HPA is an ERCP, which is both diagnostic and therapeutic, as the roundworm may be visualised to confirm the diagnosis, as well as retrieved. The pancreatic duct may need to be dilated at ERCP to facilitate evacuation of the *Ascaris*.⁹

If therapeutic ERCP is not performed, complications such as recurrence of pancreatitis may occur if roundworm remnants are retained in the pancreatic duct and calcify.

Another complication which may occur is gallstone formation. Debris such as dead or fragmented worms may serve as a nidus for intrahepatic biliary stone formation if not removed.¹⁰

TAKE HOME MESSAGES

- Acute pancreatitis can be a severe illness with high mortality if adequate treatment is not started early. Although gallstones and alcohol remain the main causes of acute pancreatitis in the Western world, helminth-induced pancreatitis is a diagnosis that must be considered in the returning traveler with a clinical picture that fits acute pancreatitis.

- Optimal treatment for HPA pancreatitis is usually medical (anti-helminthic medication), however, ERCP and worm extraction may also be of benefit to reduce the risk of complications secondary to retained products of the roundworm.
- The case we present highlights the importance of having a high index of suspicion for helminth infection as a cause of 'idiopathic', recurrent episodes of acute pancreatitis, even in patients where no recent travel history to endemic regions is evident.

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