


Clinical Pearls

First reported case of an ectopic renal giant worm (*Diectophyme renale*) infection in the abdominal cavity

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Submitted 9 December 2021; Revised 13 January 2022; Editorial Decision 3 February 2022; Accepted 3 February 2022

Key words: *Diectophyma renale*, giant kidney worm, Diectophymiasis, gastric perforation

A 42-year-old HIV-negative man from Guinee-Bissau had recently travelled through Mali, Mauritania, Algeria, Libya, and Italy to the Netherlands. He presented at the emergency department with complaints for 1 week of nausea, vomiting and abdominal pain. His condition had worsened and he suffered from partial loss of consciousness and signs of dehydration at the time of presentation. The patient was diagnosed with acute renal insufficiency, hospitalized and rehydrated with intravenous fluids. Initially, his condition improved, but after 3 days he developed abdominal pain with acute onset. Within hours he developed a septic profile despite conservative treatment with broad spectrum antibiotics and intravenous fluids. A laparotomy was performed during which a stomach perforation was identified. The surgery went successful without complications and a drain was left behind in the upper abdomen. The patient recovered quickly. After 4 days the abdominal drain was removed. During removal, a piece of a large worm, lodged in the distal tip of the drain, was extracted from the patient (Figure 1).

The worm in the drain was identified with certainty as a giant kidney worm (*Diectophyma renale*), based on the following macroscopic morphology; the colour of the freshly isolated worm, the length and shape of the worm (round and tapered off to the end).^{1,2} Furthermore, our patient turned out to have

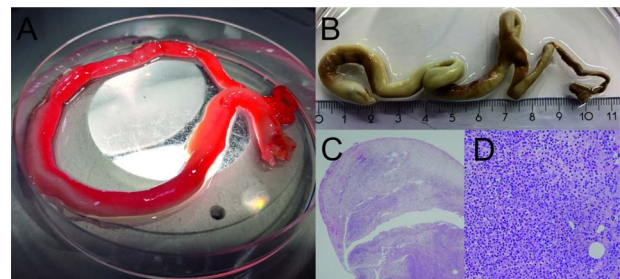


Figure 1. (A) The freshly released worm before fixation in formalin. (B) The worm after formalin fixation (bar in cm). (C) HE stained histological cross-section shows the contour of the worm (25× magnification). (D) HE stained histological cross-section shows the extensive neutrophil infiltration with destruction of the internal structures of the worm (200× magnification)

three microscopically proven co-infections (*Plasmodium malariae*, *Strongyloides stercoralis* and *Mansonella perstans*) for which he was successfully treated.

D. renale is a large nematode that parasitizes terrestrial, piscivorous mammals, including humans that are sporadically infected with only circa 40 reported cases.² Female worms can

grow up to 100 cm in length, males up to 35 cm. Adult *D. renale* normally reside in the kidney, where the worm sheds eggs in the urine. These eggs are consumed by aquatic oligochaete worms where they develop to third-stage larvae. Fish and frogs are common paratenic hosts where the third-stage larvae reside in the muscles until the paratenic host is predated upon by the definitive host. The larva penetrates the intestinal lining and migrates to the liver (where the parasite is considered to mature for ~50 days) before finally lodging in the kidney. If an adult *D. renale* is found outside the kidneys in the final host, the infection is considered ectopic. Effectiveness of anti-parasitic treatment is unknown and surgical removal is the treatment of choice in most cases.

Our patient denied having eaten raw or undercooked fish, frogs of molluscs and an ultrasound image of his kidneys showed no sign of destruction or infection. Molecular identification of the worm was unsuccessful,³ which might be explained by formalin fixation and DNA degeneration by the extensive leukocyte infiltration in the worm (Figure 1C and D). This indicates death of the worm long before prior to its removal from the abdomen. Because no indications for other causes of stomach perforations were found in gastric biopsies (e.g. *Helicobacter pylori* infection, malignancy, acidic ulceration or ischemia on gastroscopy), it seems likely that the adult worm induced the gastric perforation either by penetration of the stomach wall from the abdominal side by the living worm (which was subsequently killed by the resulting inflammatory response), or by death of the adult worm in the abdominal cavity in the vicinity of the stomach (which subsequently provoked an inflammatory response that weakened the stomach wall such that perforation was caused).

Our patient is the first reported case with a human *D. renale* infection in the abdominal cavity, whom presented with a gastric perforation and the release of an adult *D. renale* through an abdominal drain. Clinicians should be aware of rare parasitic infections in a vulnerable migrant population.

Authors' contributions

B.A.: Data analysis, literature search, writing of manuscript; J.V.T.: Data analysis, literature search, writing of manuscript; S.Y.C.: Data collection, writing of manuscript; W.M.: Data collection, writing of manuscript; V.R.M.: Data analysis, figure designing and captions; K.R.: Data analysis, figure designing and captions; D.M.P.: Data analysis, figure designing and captions; de M.M.M.: Writing of manuscript, data interpretation, literature search; Van H.J.J.: Writing of manuscript, data interpretation, literature search.

Acknowledgements

We thank Dr Corné Klaassen and Maarten Sarink, MD, for their expert attempt to identify *D. renale* by molecular methods.

Funding

This work was not supported by any funding.

Conflicts of interest: None declared.

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