First report of human anisakidosis in Australia

Shokoofeh Shamsi and Andrew R Butcher

We present the first human case of anisakidosis acquired from eating locally caught fish in Australia. A 41-year-old woman experienced gastrointestinal pain, vomiting and diarrhoea of increasing severity over 3 weeks. All symptoms resolved spontaneously after a worm was passed in her faeces. Microscopic examination showed that it was a Contracaecum *species larva of the family Anisakidae. Anisakidosis should be considered in patients with gastrointestinal symptoms who have recently eaten seafood.* **(MJA 2011; 194: 199-200)**

Clinical record

A 41-year-old Australian woman of Tongan descent presented to the Royal Adelaide Hospital with a 21-day history of intermittent, worsening gastrointestinal pain, vomiting and diarrhoea after eating raw, locally caught South Australian mackerel. She initially experienced vomiting, diarrhoea and right-sided abdominal pain. These symptoms resolved spontaneously after 2 days. Ten days later, she developed nausea, vomiting, right-sided abdominal cramps associated with a sore throat, rhinorrhoea, nasal congestion, cough with production of yellow sputum, myalgia, fevers, chills and sweats. She visited her local medical practitioner 2 days after these symptoms began, and was prescribed metoclopramide, which relieved the main symptoms. However, the symptoms returned 2 days later with increased severity. She was now vomiting up to six times a day and passing up to 10 bowel motions. She then presented to the emergency department and was given metoclopramide, hyoscine and intravenous fluids overnight. Her symptoms persisted and she was admitted to hospital the following day.

On admission, the patient was alert, orientated and afebrile, and her blood pressure and heart rate were normal. Cyanosis and jaundice were not present. Her chest was clear, and her liver and spleen were not palpable. Her right lower quadrant was tender to deep palpation and she had a mild pharyngeal erythema. A complete blood examination, including eosinophil count and blood chemistry, was unremarkable.

Three faecal samples were submitted to the Institute of Medical and Veterinary Science (IMVS), Infectious Diseases Laboratories, Adelaide; these were negative for macroscopic and microscopic blood, rotavirus, adenovirus, *Clostridium difficile* toxin and enteric bacterial pathogens, but mucus and inflammatory cells were present. Parasitology investigation was not requested.

Three days after admission, the patient passed in a bowel motion a threadlike worm, about 2 cm long, which was still moving. This worm was forwarded to the IMVS for identification. All symptoms resolved on the day the worm was passed and the patient was subsequently discharged with no further follow-up required.

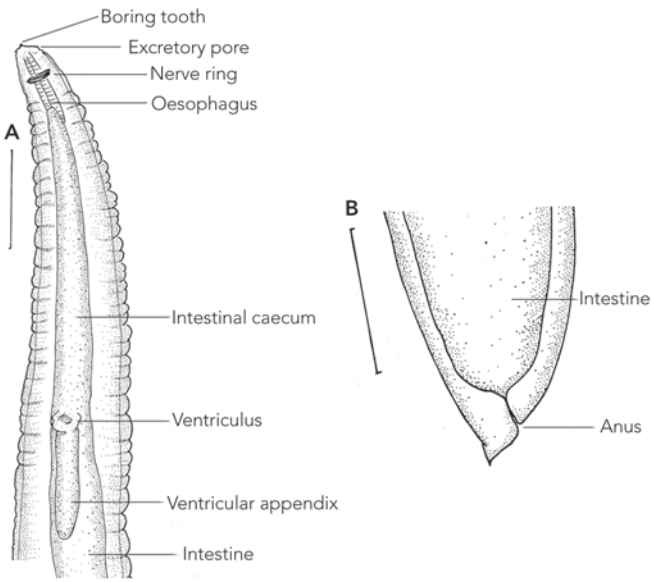
The initial presumptive identification of the larva was an intestinal nematode, possibly a species of the *Trichostrongylus* or *Ascaris* genera. However, on further detailed microscopic examination, the larva was identified as a species of *Contracaecum* (Nematoda: Anisakidae) based on the presence of an intestinal caecum and ventricular appendix (Box) and the position of the excretory pore being at the base of the mouthparts.

Discussion

Anisakidosis in humans is a well known disease resulting from accidental infestation with larvae of certain genera of anisakids, causing severe gastrointestinal disorders, allergic reaction and even death.[1] This is the first reported case of anisakidosis in Australia.

The allergic response can occur against live anisakids or food in which worms were killed by cooking or pasteurisation.[2] The pathological changes that occur within the gastrointestinal tract during infestation with anisakids are the combined result of the

Anterior end (A) and posterior end (B) of the *Contracaecum* larva recovered from the patient's faeces



*Scale bars = 0.81 mm (**A**) and 0.32 mm (**B**). Diagnostic features include the thick body and annulated cuticle; intestinal caecum about 2.5 times longer than ventricular appendix; gonads not developed short; tail, with a single spine at the tip; body length and width 17.3 mm and 1.11 mm, respectively; nerve ring 0.33 mm from anterior end; oesophagus 2.93 mm long, 17% of body length; ventricular appendix 2.52 mm long, 86% of length of oesophagus; intestinal caecum 0.96 mm long, 33% of oesophageal length and 38% of length of ventricular appendix; anus 0.07 mm from posterior end and 0.4% of body length. Drawing by Shokoofeh Shamsi. This specimen has been deposited in the South Australian Museum, Helminthology collection.* ◆

direct action of the larva during tissue invasion and the complex interaction between the host immune system and the substances released by, or contained within, the parasite.[2]

In our case, the patient's symptoms lasted about 3 weeks until a larva was passed in a bowel motion. Several cases of transient luminal anisakidosis have been reported in humans where a larva has been passed hours to weeks after consumption of infested seafood.[3] In our case, early symptoms, including vomiting, diarrhoea and abdominal pain, could have been due to unsuccessful attempts of the parasite to penetrate the gastrointestinal wall. The medication prescribed before admission to hospital most likely relieved the symptoms for a limited time. We postulate that the larva survived and moved slowly down the gastrointestinal tract, causing additional symptoms. The sore throat, rhinorrhoea, nasal congestion and cough could have been a concurrent respiratory tract infection or a late hypersensitivity response. Other symptoms could have been due to dehydration as a result of vomiting and diarrhoea.

Infestation with *Contracaecum* larvae has been reported less frequently than infestation with *Anisakis* larvae.[4,5] In addition, reports of anisakid larvae in faeces are scarce.[3] However, over 90% of cases described worldwide were caused by a single larva.[2,3] The symptoms reported are diverse and cannot be related to specific morphotype of the parasite. For example, anisakidosis due to *Pseudoterranova* larvae is mostly benign in the United States, but can be a severe infestation in Japan.[6] It is known that *Anisakis* type I larvae in Japanese mackerels caught on the eastern coast of Japan are less pathogenic than those caught on the western coast of the country.[7]

Of the many records of anisakidosis worldwide, only a few reports identified the larva to species level. This is due to the lack of species-specific morphological features in larval stages. Recently, molecular approaches have been developed to identify larvae specifically.[8] In our case, it was not possible to identify the larva to a species level due to inappropriate preservation of the specimen.

As human infestations occur after eating infested seafood, it is implied that the mackerel eaten by the patient was infested. In Australia, larval and adult stages of various species of anisakids infest a broad variety of fish, including mackerels.[8-11] However, our case report represents the first human anisakidosis acquired from eating locally caught fish. Given that the popularity of consuming raw or undercooked fish (eg, sushi) is increasing, it is possible that anisakidosis is underdiagnosed in Australia due to the vague symptoms and limited diagnostic tests. For example, in a clinicopathological study of 92 cases of anisakidosis in Japan, over 60% of cases were diagnosed preoperatively as appendicitis, acute abdomen, gastric tumour or cancer, ileitis, cholecystitis, diverticulitis, tuberculous peritonitis, and cancer of the pancreas.[12]

An experienced parasitologist can visualise anisakid larvae with the naked eye in infested fish. However, the encysted larvae are rarely observed by the consumer, as the larval colouration and texture makes it difficult to differentiate larvae from the viscera or flesh of the seafood. The occurrence of larval anisakids, with zoonotic potential in Australian fish, raises the question as to the extent of undiagnosed cases of anisakidosis in Australia. We strongly recommend that a presumptive diagnosis of anisakidosis is considered by a treating practitioner in patients with gastrointestinal symptoms and a recent history of eating raw or poorly cooked seafood.

Competing interests

None identified.

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