

## Research Note

### Intestinal anisakiasis in Italy: case report

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#### Abstract

A case of intestinal anisakiasis caused by *Anisakis* sp. larva type I in a woman from Italy who consumed raw marinated anchovies, is reported. The diagnosis was based on the morphological features characteristic of anisakid larval stages, which were readily recognized in a large granuloma removed after emergency surgical treatment.

Human anisakiasis is a fish-borne zoonotic disease caused by larval parasitic nematodes of the genus *Anisakis*. Infection occurs after the ingestion of raw, undercooked or improperly processed fish and/or squid, parasitized by these larval stages. Several types of human anisakiasis have been identified, based on the location of lesions, i.e. either gastric, intestinal, extra-gastrointestinal, oropharyngeal or transient luminal (Ishikura & Namiki, 1989a,b). Acute or chronic infections are also described in gastric and intestinal lesions. Histopathology may be classified into four stages: (i) phlegmon formation; (ii) abscess formation; (iii) abscess-granuloma formation type; and (iv) granuloma formation (Ishikura & Namiki, 1989b).

Anisakiasis is particularly prevalent in Japan (Takahashi *et al.*, 1998) and an increasing number of cases have been reported in other countries. In Italy only a few cases of anisakiasis have thus far been documented (Stallone *et al.*, 1996; Cancrini *et al.*, 1997; D'Amelio *et al.*, 1999; Maggi *et al.*, 2000; Pampiglione *et al.*, 2002). However, it appears that human anisakiasis in Italy is underdiagnosed, considering that larvae of *Anisakis* are widespread in several fish species in the Mediterranean Sea (Mattiucci

*et al.*, 1997) and the consumption of raw fish and squid is common in some regions (Sebastio, 1980; Panebianco & Lo Schiavo, 1987; Caracappa *et al.*, 1992; Stallone *et al.*, 1996). The aim of this research note is to document a human case of intestinal anisakiasis in Italy, which required emergency surgical treatment.

A 37-year-old woman was admitted to the Emergency Department of the Umberto I University Hospital with suspected acute appendicitis, confirmed by X-ray and physical and laboratory findings. A McBurney incision was performed and surgical exploration revealed a strongly suspected neoplastic lesion of the caecum: this was dilated with oedematous, inflamed and thickened walls. A midline laparotomy was performed and right colectomy was made with hand-sewn single-layer end-to-end ileo-transverse anastomosis. The post-operative period was uneventful; the patient was treated with mebendazole tablets (200 mg day<sup>-1</sup> twice a day, for three days) and discharged after 10 days. In the following 3-, 6-, 12-months follow-ups, the patient appeared in good condition, and without abdominal pain. The surgical specimen consisted of a small bowel measuring 28 cm and a tract of large bowel measuring 20 cm with a 4 cm appendix. The ileo-caecal valve was stenotic and the mucosa appeared extensively oedematous with a severe thickening of the wall of the caecum to a length of 6 cm.

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Histological sections were stained with haematoxylin-eosin revealing in the submucosa, close to the ileo-caecal valve where the eosinophilic inflammation was the most severe, a nodule, surrounded by a thick multilayered cuticle, in which a nematode in a good state of preservation was located.

At the level of the nematode intestine, the diameter of the body was  $0.50 \times 0.30$  mm with a thin cuticle, approximately  $10 \mu\text{m}$ , lacking lateral alae. Polymyarian muscle cells, separated into four quadrants by the chords, were clearly distinguished, having two wing-like distal lobes. The intestine was circular, with a triangular lumen and 60–70 tall columnar epithelial cells. Excretory cells (renette cells) were banana shaped, and situated ventrally to the intestine (fig. 1). In sagittal sections (fig. 2) the ventriculus (the glandular portion of the oesophagus) was longer than broad ( $0.65 \times 0.20$  mm) with an oblique transverse junction between the ventriculus and intestine, clearly visible. There was no ventricular appendix and/or intestinal caecum present (fig 2). The nematode was identified as an anisakid larva belonging to the genus *Anisakis*. The body diameter and the length of the ventriculus and the oblique junction between ventriculus and intestine strongly suggested its identification as *Anisakis* type I larva (*sensu* Berland, 1961).



Fig. 1. Transverse section of *Anisakis* type I larva in the submucosa of the intestinal wall. (H & E stain). Scale bar  $100 \mu\text{m}$ .

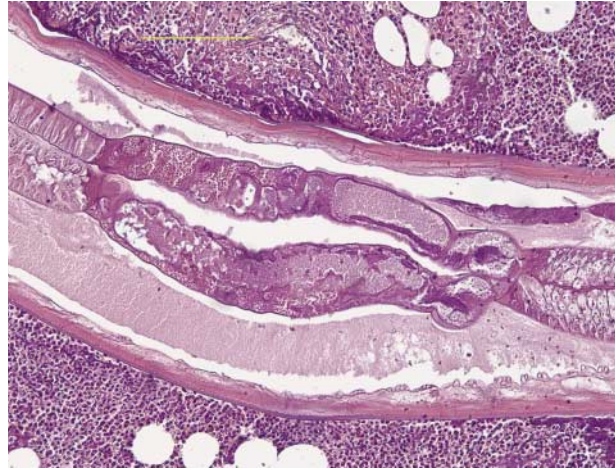


Fig. 2. Sagittal section of *Anisakis* type I larva in the submucosa of the intestinal wall (H & E stain). Scale bar  $150 \mu\text{m}$ .

The small number of cases of anisakiasis documented in Italy could reflect a lack of knowledge concerning human infections. After ingestion, larvae might either be expelled with vomit or stools, or penetrate the wall of the gastrointestinal tract. As a consequence, a local granulomatous reaction surrounds the larvae, and perforations and occlusive syndromes with voluminous granuloma are observed. Chronic intestinal anisakiasis predominantly develops into an acute abdomen-like peritonitis or intestinal occlusion and hence becomes a surgical problem, mimicking diseases, such as acute appendicitis, Crohn's disease, colo-rectal cancer, or tuberculous peritonitis. Diagnosis is performed by histological examination of the tissue and the characteristic lesion is a granuloma surrounding a larva. In this case, the initial suspicion of acute appendicitis proved to be inaccurate because a tumour-like caecum inflammation was found, subsequently revealing the presence of several nodules, one of which, near the ileo-caecum valve, contained an almost intact *Anisakis* larva type I (*sensu* Berland, 1961). In previous Italian cases of gastric, gastrointestinal and extra-gastrointestinal anisakiasis, diagnosis was based on histological findings revealing the presence of the *Anisakis* larva (Stallone *et al.*, 1996; Cancrini *et al.*, 1997; D'Amelio *et al.*, 1999; Pampiglione *et al.*, 2002). In one case, a molecular diagnosis was performed using PCR-RFLP analysis of an *Anisakis* larva removed from the gastric mucosa by endoscopy (D'Amelio *et al.*, 1999). This larva was identified as *Anisakis pegreffii* (Nascetti *et al.*, 1986; Mattiucci *et al.*, 1997).

In the present case, the larval stage could not be identified at the specific level by the use of genetic markers, which hitherto have proved useful in identifying anisakid larvae (Mattiucci *et al.*, 1997, 2002). However, based on the morphological features, it was not possible to confuse the larvae with those of other anisakid nematodes, such as the genera *Pseudoterranova*, *Contracaecum* and *Hysterothylacium*, due to the lack of a ventriculus appendix and/or intestinal caecum. It is possible that the *Anisakis* larva type I identified could correspond to *A. pegreffii*, as this species is the most

prevalent adult stage in cetaceans, with the larval stages occurring in various fish and squid from Italian seas (Nascetti *et al.*, 1986; Mattiucci *et al.*, 1997). The medical history of the patient in the present case indicated the consumption of raw marinated anchovies (*Engraulis encrasicolus*), 20 days before the onset of the abdominal pain. This fish species is frequently infected with *A. pegreffii* larvae in Italian seas (Mattiucci *et al.*, 1997).

This case report further suggests that the epidemiology of anisakiasis in Italy is likely to be underestimated, especially as larvae of *A. pegreffii* are widespread in several commercial fish species in Italian seas, and the consumption of raw fish is relatively common in some regions.

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