Anisakiasis

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Anisakiasis is caused by the accidental ingestion of larvae of the parasitic nematodes *Anisakis simplex* or *Pseudoterranova decipiens*. Anisakiasis usually occurs in the stomach and can then be diagnosed by endoscopy.

**Life cycle**

- Adult stages of *Anisakis simplex* or *Pseudoterranova decipiens* live in the stomach of marine mammals. Eggs produced by adult females are passed in the faeces.
- First-stage larvae are formed when in the water. The larvae moult to become second-stage larvae, which then hatch from the eggs and become free-swimming.
- The larvae released from the eggs are ingested by crustaceans and then develop into third-stage larvae. The crustaceans are eaten by fish and squid, where the larvae migrate from the intestine to the peritoneal cavity and grow up to 3 cm in length.
- When the host dies, larvae migrate to the muscle tissues and are transferred from the fish to the predator.
- When fish or squid containing third-stage larvae are ingested by marine mammals, the larvae develop into adult worms. The adult females produce eggs that are shed by marine mammals.
- Humans become infected by eating raw or undercooked infected marine fish. After ingestion, the larvae penetrate the stomach (less often the intestine), causing the symptoms of anisakiasis.

**Epidemiology**

- Distribution is worldwide but there is a higher incidence in areas where raw fish is eaten - for example, Japan, the Pacific coast of South America, and the Netherlands.
- With the increasing worldwide popularity of Japanese cuisine, the traditional Japanese fish dishes sushi and sashimi, which are served in Japanese restaurants and sushi bars, have been suspected of causing fishborne parasitic infestations, especially anisakiasis.

**Presentation**

- Within hours after ingestion of infected larvae, violent abdominal pain, nausea, and vomiting may occur.
- Anisakiasis affecting the small bowel is very rare but may present with abdominal pain and even small bowel obstruction, intussusception, perforation, peritonitis, or intestinal bleeding.
- Larvae in the bowel can also cause a severe eosinophilic granulomatous response 1 to 2 weeks after infection, causing symptoms resembling Crohn's disease.
- Hypersensitivity:
  - Anisakiasis may cause acute hypersensitivity and chronic urticaria.
  - Patients sensitised by prior consumption of parasitised fish develop, within a few hours, violent abdominal pain and an allergic reaction. Anisakis-induced urticaria is seen in about one in five cases.
  - Ingestion of dead worms in fish can cause severe hypersensitivity reactions. Even anaphylactic reactions may occur following exposure to allergens from dead worms by foodborne, airborne or skin contact routes.

**Investigations**

Diagnosis can be made by:

- Gastroscopy: 2 cm larvae are seen and can be removed.
- Histology of biopsy tissue removed at endoscopy or during surgery.
- Enteric anisakiasis is difficult to diagnose and diagnosis is usually based on an accurate history of eating raw fish before the onset of symptoms.

**Management**

The treatment of choice is surgical or endoscopic removal.

**Prevention**

- Adequate cooking (60°C) or freezing (-20°C for seven days or -35°C for 15 hours) of fish before eating.
However, adequate cooking or freezing probably does not protect sensitised patients from allergen exposure.\[8\]

### Further reading & references
- **Parasites A-Z**: Centers for Disease Control and Prevention
- Hökelek M et al.; Nematode Infections, Medscape, Dec 2011
- Anisakiasis, DPDx Centers for Disease Control & Prevention

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