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Case and Review

Anisakiasis of the Terminal Ileum Removed by Colonoscopy

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Keywords

Anisakiasis · Parasite · Small intestine · Colonoscopy

Abstract

A 35-year-old Japanese man with no significant medical history presented to the emergency department complaining of abdominal pain, nausea, and vomiting 35 h after ingesting raw horse mackerel, sardines, and tuna. Computed tomography of the abdomen with intravenous contrast revealed significant thickening of the terminal ileum with mild proximal dilatation and moderate ascites. On colonoscopy, an actively moving anisakis larva was discovered in the terminal ileum. The larva was removed with endoscopic forceps. The patient's symptoms resolved quickly following the procedure.

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Introduction

Anisakiasis is caused by consuming larvae of anisakis, a parasitic nematode found in seafood. First reported by van Thiel et al. [1] in 1960, the parasitic infection is common in areas such as Japan where raw fish are consumed regularly. Almost all cases are associated with

ingestion of raw or undercooked seafood such as cod, tuna, squid, salmon, shark, mackerel, and possibly raw clams [2, 3]. Anisakis most commonly affects the stomach but may affect any part of the gastrointestinal tract, as well as extraintestinal sites such as the liver and pancreas [4, 5].

Small bowel anisakiasis (SBA) is rare compared to gastric anisakiasis. While gastric anisakiasis generally presents with sharp abdominal pain, SBA may also present with small bowel obstruction due to localized bowel edema resulting from an allergic response to the parasite. The small bowel presents hurdles for both diagnosis and treatment as endoscopic access is limited. While a recent history of raw fish ingestion, serum antibody titers and/or characteristic computed tomography (CT) findings can lead to a presumptive diagnosis, treatment is usually conservative. Here, we present the first report in English of anisakiasis of the terminal ileum confirmed and removed by colonoscopy.

Case Report/Case Presentation

A 35-year-old Japanese man with no significant medical history presented to the emergency department complaining of abdominal pain, nausea, and vomiting 35 h after ingesting raw horse mackerel, sardines, and tuna. Vital signs were normal. Physical examination revealed tenderness to palpation in the epigastrium with no rebound tenderness and a tympanic sound upon percussion. Laboratory tests were significant for leukocytosis ($13,500/\text{mm}^3$) with no eosinophilia and elevated C-reactive protein (2.07 mg/dL). Contrast CT of the abdomen revealed significant edema of the terminal ileum with mild proximal dilatation and moderate ascites (Fig. 1). Inflammation appeared to reach the ileocecal valve, suggesting that the affected site may be accessible colonoscopically.

Colonoscopy was performed using PCF-Q260AZI (Olympus Corp., Tokyo, Japan) after bowel preparation, as the patient was able to pass gas. An actively moving anisakid larva was discovered in the terminal ileum, which was removed with endoscopic forceps (Fig. 2). The patient's symptoms quickly resolved following the procedure. He was discharged free of symptoms two days later. Serum titer of anti-anisakis IgG/A antibody was later found to be positive (1.73, normal range <1.50).

Discussion/Conclusion

While SBA was initially estimated to account for less than 5% of anisakiasis in humans, recent estimates of its incidence have been as high as 30.5% of anisakiasis cases [6–8]. SBA patients tend to be older, male, regular drinkers, and have higher heart rates and CRP than gastric anisakiasis patients [8]. Anisakid larvae in the small bowel have a predilection for the ileum, particularly the terminal ileum [9, 10]. Symptoms generally occur within 5 days of ingestion and most commonly include abdominal pain, nausea, and vomiting with or without bowel obstruction. Hemorrhagic shock, intussusception, and perforation have also been reported [7, 11, 12].

The low historical incidence may be the result of underdiagnosis as well as underreporting. Whereas gastric anisakiasis can be confirmed by directly visualizing larvae during esophagogastroduodenoscopy, there is no gold standard for the diagnosis of SBA. SBA is diagnosed clinically, radiologically, and/or with anti-anisakis IgG/A titers. Titers have a moderate sensitivity of 70% and specificity of 87% [13, 14]. Common CT findings such as segmental intestinal edema presenting with the “target sign” accompanied by proximal dilatation, fat stranding, and ascites are seen in most patients but must be differentiated from other sources of inflammation as well as tumors [9, 10, 15]. While 2 cases of larva detection with capsule endoscopy have been reported, bowel obstruction must be ruled out before conducting this examination [16, 17].

Standard therapy for SBA has not been established. Conservative treatment is generally effective, although patients are admitted for an average of 9 days and about 7% require surgery [7, 11]. Cases of successful treatment using Gastrografin or steroids with antihistamines have been reported [18, 19]. However, endoscopic removal is the only available method of removing the causative parasite without surgery.

Searches on PubMed and Ichushi revealed no reports of endoscopic removal for SBA in English and 6 reports in Japanese (Table 1) [20–25]. The ileum was affected in all cases. Two cases were treated with a double-balloon enteroscope, while the other 5 cases including our case were treated with a colonoscope. All 7 cases experienced immediate relief after the procedure. While double-balloon enteroscopy is not widely available, the terminal ileum can be approached with a regular colonoscope. Long colonoscopes such as PCF-H290ZL (Olympus) are longer than regular colonoscopes and may be useful if a more proximal portion of the ileum is involved. Bowel perforation and obstruction must be ruled out before considering bowel preparation.

In conclusion, we report a case of anisakiasis of the terminal ileum which was confirmed and treated using a colonoscope. Endoscopic treatment has led to immediate symptomatic relief in all successful cases in the literature and may be a viable option in selected patients.

Statement of Ethics

The patient has given his written informed consent to publish this case (including publication of images). The identity of the patient has been protected.

Conflict of Interest Statement

The authors have no conflicts of interest to declare.

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None.

Author Contributions

Takeshi Okamoto wrote the manuscript, diagnosed the patient, and performed the colonoscopy. Katsuyuki Fukuda edited the manuscript. Both gave final approval of the manuscript.

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Fig. 1. Contrast CT of the abdomen revealed significant edema of the terminal ileum with mild proximal dilatation and moderate ascites.

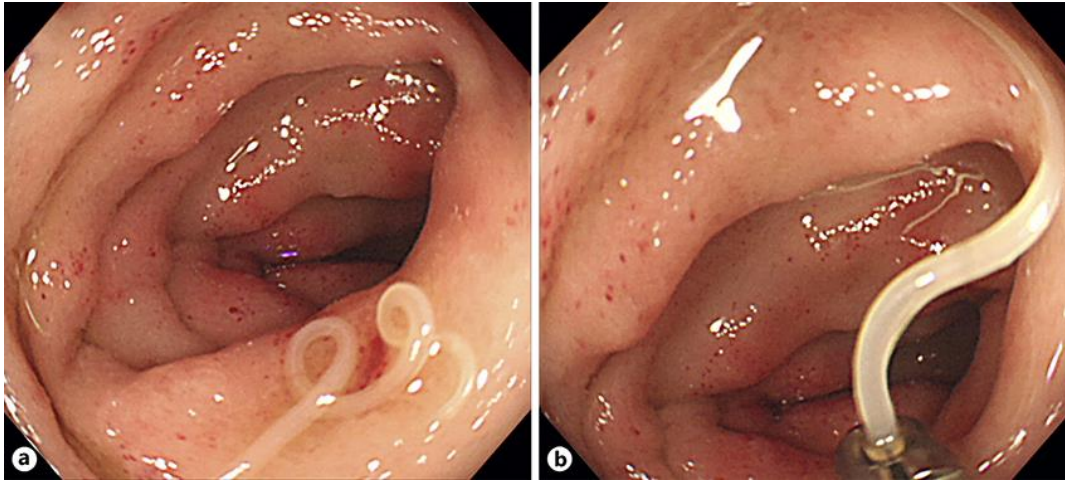


Fig. 2. Anisakid larva discovered on colonoscopy (a) was successfully removed with endoscopic forceps (b).

Table 1. Reports of small bowel anisakiasis treated endoscopically

Case	Author	Year	Age	Gender	Symptoms	Time from raw fish ingestion to onset	Anisakis IgG/A anti-body	Temperature, °C	WBC, / μ L	EOS, %	CRP, mg/dL	Endoscope	Location	Result
1	Yarimizu	1998	34	Male	AP, D	3 days	NA	36.8	5,800	7	0.06	Colonoscope	Terminal ileum	Immediate relief
2	Sato	2001	30	Female	AP, D	NA	NA	36.9	3,900	5.2	0.07	Colonoscope	Terminal ileum	Immediate relief
3	Takahara	2013	31	Female	AP, N	15 h	-	36.9	10,300	0	2.08	DBE	Ileum	Immediate relief
4	Amano	2013	52	Male	AP, urticaria	2 days	+	36.2	7,640	2.5	7.55	DBE	Ileum	Immediate relief
5	Kawata	2015	29	Male	AP	2 h	-	36.5	7,660	1.8	1.66	Colonoscope	Terminal ileum	Immediate relief
6	Murakami	2018	61	Male	AP	1 day	+	35.1	11,100	1.6	0.57	Colonoscope	Terminal ileum	Immediate relief
7	Our case	2020	35	Male	AP, N, V	35 h	+	37.3	13,500	2.8	2.07	Colonoscope	Terminal ileum	Immediate relief

AP, abdominal pain; CRP, C-reactive protein; DBE, double-balloon enteroscope; EOS, eosinophils; N, nausea; NA, not available; V, vomiting; WBC, white blood cells.