—Case Reports—

Ascites Caused by Intestinal Anisakiasis: A Case Report and Literature Review

Yutaka Furuta[1], Naoto Matsuda[2], Hiroaki Wakakuri[2], Hideya Hyodo[2], Toshihiko Ohara[2], Gen Takagi[2] and Masahiro Yasutake[2]

[1]Department of Pediatrics, Vanderbilt University Medical Center, Tennessee, USA
[2]Department of General Medicine and Health Science, Nippon Medical School, Tokyo, Japan

Anisakiasis is a parasitic infection affecting the human gastrointestinal tract. It is caused by the consumption of contaminated, raw or inadequately cooked fish or squid, which is typically used for making sushi and sashimi. Most cases involve gastric anisakiasis, whereas intestinal anisakiasis is rare. This report describes the case of a 63-year-old Japanese woman with a history of raw fish consumption who presented with acute-onset abdominal pain and vomiting. Abdominal computed tomography (CT) demonstrated thickened small bowel loops and ascites on the liver surface. The patient was admitted for supportive care. On the second day of hospitalization, contrast-enhanced abdominal CT revealed that the ascites had moved from the liver surface to the pouch of Douglas. On the fifth day of hospitalization, the patient was discharged with a substantial improvement in abdominal pain. Five days after the discharge, her eosinophil count was elevated, and parasitic disease was therefore suspected. Anti-*Anisakis* IgG/A and IgE (RAST) antibody levels were elevated, confirming the diagnosis of intestinal anisakiasis. A review of 51 reported cases of intestinal anisakiasis suggests that the presence of ascites and measurement of anti-*Anisakis* antibody titers are helpful for diagnosis in cases presenting with nonspecific abdominal symptoms after consumption of raw or undercooked fish.
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Key words: abdominal pain, ascites, intestinal anisakiasis, raw fish

Introduction

Anisakiasis is a parasitic infection of the gastrointestinal tract caused by *Anisakis* larvae invading the gastrointestinal mucosa after ingestion of raw fish contaminated with the parasitic *Anisakis* spp[1]. Approximately 20,000 cases of anisakiasis are reported worldwide annually, and more than 90% of these patients are from Japan[2]. With the recent increase in the popularity of Japanese cuisine, such as sushi and sashimi, the incidence of anisakiasis has increased even outside Japan[3,4].

Although most anisakiasis cases are limited to gastric involvement, intestinal anisakiasis does rarely occur[5]. Intestinal anisakiasis can present with nonspecific abdominal manifestations, including abdominal pain, nausea, vomiting, and diarrhea[6]. Common complications include intestinal obstruction, perforation, and bleeding[7]. Typical findings of intestinal anisakiasis on computed tomography (CT) include intestinal wall thickening with luminal narrowing, ascites, and fluid collection in the distal segment of the constricted small intestine[8–10]. Its rarity and the nonspecificity of symptoms and CT findings make the diagnosis of intestinal anisakiasis difficult.

Here, we report a case of ascites of unknown etiology that was ultimately diagnosed as intestinal anisakiasis. We also reviewed the relevant literature on intestinal anisakiasis.

Case Report

A 63-year-old Japanese woman presented to the emergency department with progressive acute-onset abdominal pain and vomiting. She had consumed Mackerel pike (Sanma) sashimi 5 days prior to the visit. She denied having diarrhea, constipation, fever, shortness of breath, recent travel, or contact with sick individuals. The rest of

Correspondence to Naoto Matsuda, Department of General Medicine and Health Science, Nippon Medical School, 1–1–5 Sendagi, Bunkyo-ku, Tokyo 113–8602, Japan
E-mail: naoto-matsuda@nms.ac.jp
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review of systems was negative. Her vital signs showed a temperature of 36.2°C, pulse rate of 83 beats per minute, respiratory rate of 28 respirations per minute, blood pressure of 129/78 mmHg, and an oxygenation saturation of 99% on room air. Upon physical examination, she was alert and responsive, with a Glasgow Coma Scale score of 15 and a Japanese Coma Scale score of 0. Her respiration was unlabored, and her lungs were clear on bilateral auscultation. Cardiovascular examination results were unremarkable, with normal heart sounds and no murmurs, rubs, or gallops. Her abdomen was soft and non-distended; however, she had marked tenderness on palpation in the right lower quadrant, without guarding or rebound tenderness. Bowel sounds were normal. The remaining physical examination results were normal. Laboratory results revealed a white blood cell count of 9,200/mm^3 (granulocytes, 86.8%; monocytes, 2.8%; eosinophils, 0.6%), hemoglobin level of 17.3 g/dL, and platelet count of 175,000/mm^3. Her comprehensive metabolic panel and amylase level were within normal limits. Her HbA1c was 5.7%. An abdominal radiography revealed significant bowel gas. A chest radiography was unremarkable. Abdominal CT revealed thickened small bowel loops and ascites on the liver surface (**Fig. 1**). However, ischemic colitis could not be excluded. Thus, she was admitted for further evaluation and management of abdominal pain and ascites of unknown cause.

The initial differential diagnoses included a wide range of conditions from acute surgical abdomen to infectious enteritis. Infusion of lactate Ringer's solution and intravenous administration of cefmetazole 1 g twice a daily were initiated. Her symptoms improved rapidly; however, the presence of ascites could not be attributed to ordinary infectious enteritis. On the second day of hospitalization, contrast-enhanced abdominal CT scan demonstrated ileal wall thickening without poor contrast enhancement (**Fig. 2**). The ascites had moved from the liver surface to the pouch of Douglas while ischemic colitis was excluded. Her abdominal pain and serial abdominal examination had improved. On the fifth day of hospitalization, the patient was discharged with significant improvement of symptoms that were presumably due to common viral enteritis.

Five days after discharge, her complete blood cell count revealed an elevated the eosinophil count of 12.8%, which raised the suspicion of parasitic diseases. Anti-*Anisakis* IgG/A and IgE (RAST) antibody levels were elevated to 2.20 (normal value, ≤ 1.50) and 39.5 UA/mL (normal value, ≤ 0.34), respectively, which confirmed the diagnosis of intestinal anisakiasis.

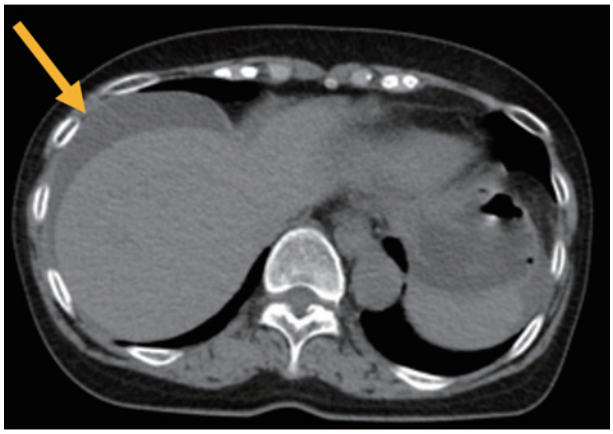

Fig. 1 Abdominal computed tomography showing ascites (arrow) on the liver surface.

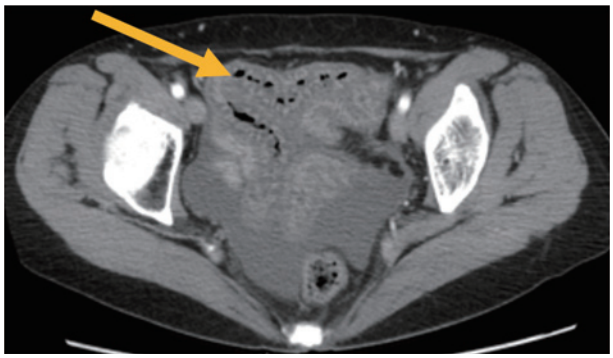

Fig. 2 Abdominal computed tomography with contrast enhancement demonstrating ileal wall thickening without poor contrast enhancement (arrow), as well as ascites extending from the liver surface to the pouch of Douglas.

Informed consent was verbally obtained from the patient.

Discussion

Here, we describe the case of a patient with ascites of unknown cause who was diagnosed with intestinal anisakiasis based on a history of raw fish consumption and elevated titers of anti-*Anisakis* antibodies. According to Ishikura et al.[11], gastric anisakiasis accounts for 95.6% of all cases, intestinal anisakiasis for 4.1% of cases, and infestation at other sites for 0.3%. Symptoms typically develop 12-24 hours after the ingestion of infected foods in cases of gastric anisakiasis, and 5-7 days after ingestion in cases of intestinal anisakiasis[3,12,13].

Intestinal anisakiasis can present with a broad range of abdominal symptoms, such as abdominal pain, nausea, vomiting, and diarrhea[6]. One study reported that complications include intestinal obstruction (50.7%), perforation

Table 1 Summary of our case and review of previously reported intestinal anisakiasis cases

Case	Age/ Sex	Presentation	Ascites (CT)	Endoscopy	Antibody	Operation	Author
1	63/F	AP, V	Yes	N/A	IgG/A Positive	N/A	Furuta et al. (Our case)
2	59/M	AP	No	Yes	N/A	Colectomy	Choi et al., 2019[26]
3	30/M	AP, V	No	N/A	N/A	SB resection	Carlin et al., 2018[27]
4	59/F	AP, V	Yes	Yes	N/A	N/A	Fujikawa et al., 2018[28]
5	42/M	AP	Yes	N/A	N/A	SB resection	Shimamura et al., 2016[18]
6	47/M	AP, V	No	Yes	Antigen positive	N/A	Baeza-Trinidad et al., 2015[29]
7	20/M	AP, V	Unknown	Yes	N/A	SB resection	Baron et al., 2014[30]
8	52/F	AP, V, D	Yes	Yes	N/A	SB resection	Baron et al., 2014[30]
9	36/F	AP	Unknown	Yes	N/A	SB resection & colectomy	Baron et al., 2014[30]
10	39/M	AP	Unknown	Yes	N/A	SB resection	Baron et al., 2014[30]
11	27/M	AP	Yes	Yes	N/A	SB resection	Baron et al., 2014[30]
12	50/M	AP	Yes	Yes	N/A	SB resection	Baron et al., 2014[30]
13	64/M	AP, N, D	Yes	N/A	N/A	SB resection	Shweiki et al., 2014[12]
14	62/M	AP	No	N/A	IgG/A Positive	N/A	Shrestha et al., 2014[31]
15	38/M	AP	Yes	N/A	IgG/A Positive	N/A	Shrestha et al., 2014[31]
16	47/F	AP	Unknown	N/A	IgG/A Positive	N/A	Shrestha et al., 2014[31]
17	63/F	AP, V	Yes	N/A	IgG/A Positive	N/A	Takano et al., 2013[15]
18	61/M	AP	Yes	N/A	N/A	SB resection	Kojima et al., 2013[32]
19	14/M	AP, V	Unknown	N/A	N/A	SB resection	Juric et al., 2013[33]
20	34/M	AP	Yes	N/A	IgG/A&E Positive	SB resection	Fujioka et al., 2012[34]
21	30/M	AP	Yes	N/A	N/A	SB resection	Oshima et al., 2011[35]
22	60/F	AP, V, FV	Unknown	N/A	N/A	SB resection	Kang et al., 2010[36]
23	47/M	AP	Yes	Yes	Positive	SB resection	Fujii et al., 2009[37]
24	51/F	AP, V	Yes	N/A	N/A	SB resection	Masui et al., 2006[38]
25	59/M	AP, N	Yes	Only Gastrografin	IgG Positive	SB resection	Matsuo et al., 2006[39]
26	62/M	AP, V	Yes	Only Gastrografin	IgE Positive	SB resection	Matsuo et al., 2006[39]
27	32/F	AP, N, C	Yes	N/A	N/A	SB resection	Ramos et al., 2005[40]
28	34/M	U, SOB, facial angioedema	Yes	N/A	N/A	SB resection	Ramos et al., 2005[40]
29	80/M	AP, C	Unknown	N/A	N/A	SB resection	Ramos et al., 2005[40]
30	49/M	AP, V	Yes	Yes	N/A	N/A	Ramos et al., 2005[40]
31	76/M	AP, N	Yes	N/A	N/A	N/A	Ramos et al., 2005[40]
32	53/F	AP	Unknown	N/A	N/A	N/A	Ramos et al., 2005[40]
33	62/M	AP, N, C	Unknown	N/A	N/A	N/A	Ramos et al., 2005[40]
34	25/M	AP, N, U	Unknown	N/A	N/A	N/A	Ramos et al., 2005[40]
35	54/M	AP	Yes	N/A	N/A	SB resection	Yoon et al., 2004[9]
36	31/F	AP, V, D	Yes	N/A	N/A	SB resection	Caramello et al., 2003[24]
37	50/M	AP, N, C	Yes	N/A	N/A	SB resection	Couture et al., 2003[41]
38	59/M	AP, V	Yes	N/A	N/A	SB resection	Sasaki et al., 2003[14]
39	43/M	AP	Yes	Yes	N/A	SB resection	Maggi et al., 2000[42]
40	60/F	AP, V	Yes	N/A	N/A	SB resection	Takabe et al., 1998[4]
41	53/F	AP	Yes	N/A	Negative	SB resection	Kano et al., 1990[43]
42	38/M	AP	Yes	N/A	Positive	SB resection	Kano et al., 1990[43]
43	43/M	AP	Yes	N/A	Positive	N/A	Kano et al., 1990[43]
44	52/M	AP	Yes	N/A	Positive	N/A	Kano et al., 1990[43]
45	56/M	AP	Yes	N/A	Negative	N/A	Kano et al., 1990[43]
46	33/M	AP	Yes	N/A	Positive	N/A	Kano et al., 1990[43]
47	11/F	AP	Yes	N/A	Negative	Only exploratory laparotomy	Kano et al., 1990[43]
48	30/M	AP	Yes	N/A	Positive	N/A	Kano et al., 1990[43]
49	15/M	AP, V	Yes	N/A	Positive	N/A	Kano et al., 1990[43]
50	35/F	AP, V	Yes	N/A	Positive	N/A	Kano et al., 1990[43]
51	30/F	AP	Yes	Yes	N/A	SB resection	Appleby et al., 1982[44]

AP, abdominal pain; C, constipation; CT, computed tomography; D, diarrhea; F, female; FV, fever; M, male; N, nausea; N/A, not applicable; SB, small bowel; SOB, shortness of breath; U, urticaria; V, vomiting

(8%), and bleeding (2%)[7]. The definitive diagnosis of intestinal anisakiasis is clinically challenging not only because there are no established diagnostic criteria, but also because symptoms and laboratory/imaging findings are nonspecific[14]. Therefore, obtaining a history of recent raw fish consumption is vital for accurate diagnosis[6,15]. The differential diagnoses are broad and include acute appendicitis, ileitis, diverticulitis, cholecystitis, inflammatory bowel disease, peptic ulcers, small bowel obstruction, and intussusception[16,17]. CT is useful in the diagnosis of intestinal anisakiasis[8,9], revealing marked submucosal edema and thickening of the intestinal wall, luminal narrowing, ascites, and/or fluid collection in the distal segment of the constricted small intestine[8–10].

A review of 50 previously reported cases of intestinal anisakiasis, in addition to our case, is summarized in **Table 1**. The median age at diagnosis of intestinal anisakiasis was 47 years (range, 11-80 years). Of the 51 patients, 35 (69%) were men, and 16 (31%) were women. The most common presenting symptom was abdominal pain (n = 50, 98%), followed by vomiting (n = 17, 33%), diarrhea (n = 4, 8%), constipation (n = 4, 8%), urticaria (n = 2, 4%), and fever (n = 1, 2%). Our patient presented with abdominal pain, nausea, and vomiting, which are the most typical symptoms of intestinal anisakiasis.

While ascites was demonstrated on abdominal CT in 37 patients (72%), ascites was not found in four patients (8%), while ascites was not mentioned in 10 case reports (20%). This suggests that the presence of ascites has not typically been regarded as important as intestinal wall thickening for the CT diagnosis of intestinal anisakiasis. Shimamura et al.[18] suggested four criteria for the diagnosis of intestinal anisakiasis: clinical features consistent with intestinal anisakiasis, a history of consumption of raw or undercooked fish within the previous 2 weeks, elevated levels of anti-*Anisakis* IgG/A or IgE antibodies, and presence of segmental intestinal edema and a distended proximal small bowel on CT. In fact, the clinical presentations of our patient met all four of these suggested criteria. However, the criteria do not include the presence of ascites. Nevertheless, our study of the literature indicates that more than 70% of cases present with ascites, and we propose that ascites should be considered a valuable diagnostic imaging index. In this context, our patient's clinical scenario, which included the above four characteristics plus ascites, appears to be very typical in intestinal anisakiasis.

Endoscopic evaluations were performed in 13 cases (25%), and an upper gastrointestinal series using Gastrografin contrast agent was conducted in two cases (4%). Surgical intervention was performed in 33 patients (61%). In 37 cases with ascites on CT, 24 (65%) underwent surgical interventions, including exploratory laparotomy, small bowel resection, or colectomy, which suggests that more than 60% of cases of intestinal anisakiasis could mimic an acute surgical abdomen. Exploratory laparotomy was performed in 30 patients (60%). In these cases, intestinal anisakiasis was not initially suspected, but was revealed by exploratory laparotomy.

Anti-*Anisakis* antibodies are useful for the diagnosis of anisakiasis. Anti-*Anisakis* antibodies were measured in 19 patients (37%), of which 16 (31%) were positive. In contrast, antibodies were not measured in 31 patients (61%). An antigen was tested instead of an antibody in one case (2%). Elevated IgE antibody titers in the blood have a sensitivity of 100%, but a specificity of only 50% because of cross-reactions from other parasites, such as *Ascaris*, *Toxocara*, and *Echinococcus*[19,20], while elevated IgG/A antibody titers have a sensitivity of 70% and a specificity of 87%[21,22]. In our case, anti-*Anisakis* antibodies were the diagnostic key; however, an earlier consideration of intestinal anisakiasis as a differential diagnosis of ascites might have prompted earlier testing for anti-*Anisakis* antibodies. Although paired sera were not obtained in our case, the use of such paired sera could provide more accurate diagnostic yield by mitigating the potential for false negatives during the early stages of symptom onset[21].

Based on the above findings, we believe that the presence of ascites and the measurement of anti-*Anisakis* antibody titers may be useful for the diagnosis of intestinal anisakiasis. It is reasonable to propose that intestinal anisakiasis should be included on the list of differential diagnoses, especially when patients present with nonspecific abdominal symptoms after eating raw or undercooked fish[6,23,24]. According to Ido et al.[25], the actual number of intestinal anisakiasis cases is estimated to be greater than previously reported. Understanding the importance of ascites and anti-*Anisakis* antibodies will hopefully lead to the detection of more undiagnosed cases of intestinal anisakiasis.

Conclusions

Herein, we report a case of intestinal anisakiasis associated with ascites. It is suggested that intestinal anisakiasis should be considered in patients with nonspecific abdominal symptoms accompanied by the presence of ascites on abdominal CT scan, particularly in patients with a recent history of recent raw fish consumption, and that

the measurement of anti-*Anisakis* antibodies is beneficial for diagnosis.

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References

1. Nawa Y, Hatz C, Blum J. Sushi delights and parasites: the risk of fishborne and foodborne parasitic zoonoses in Asia. Clin Infect Dis. 2005 Nov 1;41(9):1297−303. Epub 2005 Sep 22. doi: 10.1086/496920. PubMed PMID: 16206105
2. Pravettoni V, Primavesi L, Piantanida M. Anisakis simplex: current knowledge. Eur Ann Allergy Clin Immunol. 2012 Aug;44(4):150−6. PubMed PMID: 23092000
3. Ahmed M, Ayoob F, Kesavan M, Gumaste V, Khalil A. Gastrointestinal anisakidosis - watch what you eat. Cureus. 2016 Nov 2;8(11):e860. doi: 10.7759/cureus.860. PubMed PMID: 27924249; PubMed Central PMCID: PMC5137990
4. Takabe K, Ohki S, Kunihiro O, et al. Anisakidosis: a cause of intestinal obstruction from eating sushi. Am J Gastroenterol. 1998 Jul;93(7):1172−3. doi: 10.1111/j.1572-0241.1998.00356.x. PubMed PMID: 9672357
5. Ramanan P, Blumberg AK, Mathison B, Pritt BS. Parametrial anisakidosis. J Clin Microbiol. 2013 Oct;51(10):3430−4. Epub 2013 Jul 17. doi: 10.1128/JCM.01398-13. PubMed PMID: 23863565; PubMed Central PMCID: PMC3811649
6. Kojima G, Usuki S, Mizokami K, Tanabe M, Machi J. Intestinal anisakiasis as a rare cause of small bowel obstruction. Am J Emerg Med. 2013 Sep;31(9):1422.e1−2. Epub 2013 Jun 18. doi: 10.1016/j.ajem.2013.05.015. PubMed PMID: 23786678
7. Yasunaga H, Horiguchi H, Kuwabara K, Hashimoto H, Matsuda S. Clinical features of bowel anisakiasis in Japan. Am J Trop Med Hyg. 2010 Jul;83(1):104−5. doi: 10.4269/ajtmh.2010.09-0780. PubMed PMID: 20595486; PubMed Central PMCID: PMC2912584
8. Ozcan HN, Avcu S, Pauwels W, Mortele KJ, De Backer AI. Acute intestinal anisakiasis: CT findings. Acta Gastroenterol Belg. 2012 Sep;75(3):364−5. PubMed PMID: 23082711
9. Yoon SW, Yu JS, Park MS, Shim JY, Kim HJ, Kim KW. CT findings of surgically verified acute invasive small bowel anisakiasis resulting in small bowel obstruction. Yonsei Med J. 2004 Aug 31;45(4):739−42. doi: 10.3349/ymj.2004.45.4.739. PubMed PMID: 15344219
10. Shibata E, Ueda T, Akaike G, Saida Y. CT findings of gastric and intestinal anisakiasis. Abdom Imaging. 2014 Apr;39(2):257−61. doi: 10.1007/s00261-014-0075-3. PubMed PMID: 24441579; PubMed Central PMCID: PMC3953542
11. Ishikura H, Kikuchi K, Nagasawa K, et al. Anisakidae and anisakidosis. Prog Clin Parasitol. 1993;3:43−102. doi: 10.1007/978-1-4612-2732-8_3. PubMed PMID: 8420604
12. Shweiki E, Rittenhouse DW, Ochoa JE, Punja VP, Zubair MH, Baliff JP. Acute small-bowel obstruction from intestinal anisakiasis after the ingestion of raw clams; documenting a new method of marine-to-human parasitic transmission. Open Forum Infect Dis. 2014 Sep 26;1(2):ofu087. doi: 10.1093/ofid/ofu087. PubMed PMID: 25734153; PubMed Central PMCID: PMC4281795
13. Takabayashi T, Mochizuki T, Otani N, Nishiyama K, Ishimatsu S. Anisakiasis presenting to the ED: clinical manifestations, time course, hematologic tests, computed tomographic findings, and treatment. Am J Emerg Med. 2014 Dec;32(12):1485−9. Epub 2014 Sep 18. doi: 10.1016/j.ajem.2014.09.010. PubMed PMID: 25440233
14. Sasaki T, Fukumori D, Matsumoto H, Ohmori H, Yamamoto F. Small bowel obstruction caused by anisakiasis of the small intestine: report of a case. Surg Today. 2003;33(2):123−5. doi: 10.1007/s005950300027. PubMed PMID: 12616375
15. Takano Y, Gomi K, Endo T, et al. Small intestinal obstruction caused by anisakiasis. Case Rep Infect Dis. 2013;2013:401937. Epub 2013 Dec 26. doi: 10.1155/2013/401937. PubMed PMID: 24455340; PubMed Central PMCID: PMC3888701
16. Miura T, Iwaya A, Shimizu T, et al. Intestinal anisakiasis can cause intussusception in adults: an extremely rare condition. World J Gastroenterol. 2010 Apr 14;16(14):1804−7. doi: 10.3748/wjg.v16.i14.1804. PubMed PMID: 20380017; PubMed Central PMCID: PMC2852833
17. Chikamori F, Kuniyoshi N, Takase Y. Intussusception due to intestinal anisakiasis: a case report. Abdom Imaging. 2004 Jan-Feb;29(1):39−41. doi: 10.1007/s00261-003-0071-5. PubMed PMID: 15160751
18. Shimamura Y, Muwanwella N, Chandran S, Kandel G, Marcon N. Common symptoms from an uncommon infection: gastrointestinal Anisakiasis. Can J Gastroenterol Hepatol. 2016;2016:5176502. Epub 2016 Oct 9. doi: 10.1155/2016/5176502. PubMed PMID: 27800471; PubMed Central PMCID: PMC5075291
19. Sakanari JA, Loinaz HM, Deardorff TL, Raybourne RB, McKerrow JH, Frierson JG. Intestinal anisakiasis. A case diagnosed by morphologic and immunologic methods. Am J Clin Pathol. 1988 Jul;90(1):107−13. doi: 10.1093/ajcp/90.1.107. PubMed PMID: 3291604
20. Lorenzo S, Iglesias R, Leiro J, et al. Usefulness of currently available methods for the diagnosis of Anisakis simplex allergy. Allergy. 2000 Jul;55(7):627−33. doi: 10.1034/j.1398-9995.2000.00471.x. PubMed PMID: 10921461
21. Yagihashi A, Sato N, Takahashi S, Ishikura H, Kikuchi K. A serodiagnostic assay by microenzyme-linked immunosorbent assay for human anisakiasis using a monoclonal antibody specific for Anisakis larvae antigen. J Infect Dis. 1990 May;161(5):995−8. doi: 10.1093/infdis/161.5.995. PubMed PMID: 2324550
22. Matsushita M, Okazaki K. Serologic test for the diagnosis of subclinical gastric anisakiasis. Gastrointest Endosc. 2005 Jun;61(7):931; author reply 931. doi: 10.1016/s0016-5107(05)00505-5. PubMed PMID: 15933710
23. Navarro Cantarero E, Carro Alonso B, Castillo Lario C, Fernandez Gomez JA. Diagnostico de la infestacion por Anisakis. Experiencia en nuestro medio [Diagnosis of Anisakis infestation: experience in our environment]. Allergol Immunopathol (Madr). 2005 Jan-Feb;33(1):27−30. Spanish. doi: 10.1157/13070605. PubMed PMID: 15777520
24. Caramello P, Vitali A, Canta F, et al. Intestinal localization of anisakiasis manifested as acute abdomen. Clin Microbiol Infect. 2003 Jul;9(7):734−7. doi: 10.1046/j.1469-0691.2003.00660.x. PubMed PMID: 12925120
25. Ido K, Yuasa H, Ide M, Kimura K, Toshimitsu K, Suzuki T. Sonographic diagnosis of small intestinal anisakiasis. J Clin Ultrasound. 1998 Mar-Apr;26(3):125−30. doi: 10.1002/(sici)1097-0096(199803/04)26:3<125::aid-jcu3>3.0.co;2-o. PubMed PMID: 9502034

26. Choi YI, Park DK, Cho HY, et al. Adult intussusception caused by colonic anisakis: a case report. World J Clin Cases. 2019 Sep 6;7(17):2536–41. doi: 10.12998/wjcc.v7.i17.2536. PubMed PMID: 31559289; PubMed Central PMCID: PMC6745326
27. Carlin AF, Abeles S, Chin NA, Lin GY, Young M, Vinetz JM. Case report: a common source outbreak of anisakidosis in the United States and postexposure prophylaxis of family collaterals. Am J Trop Med Hyg. 2018 Nov;99(5):1219–21. doi: 10.4269/ajtmh.18-0586. PubMed PMID: 30226150; PubMed Central PMCID: PMC6221231
28. Fujikawa H, Kuwai T, Yamaguchi T, et al. Gastric and enteric anisakiasis successfully treated with Gastrografin therapy: a case report. World J Gastrointest Endosc. 2018 Mar 16;10(3):69–73. doi: 10.4253/wjge.v10.i3.69. PubMed PMID: 29564036; PubMed Central PMCID: PMC5852334
29. Baeza-Trinidad R, Pinilla-Moraza J, Moreno-Medina A. Proximal ileitis secondary to anisakiasis. Acta Clin Belg. 2015 Oct;70(5):387. doi: 10.1080/17843286.2015.1131963. PubMed PMID: 26743576
30. Baron L, Branca G, Trombetta C, et al. Intestinal anisakidosis: histopathological findings and differential diagnosis. Pathol Res Pract. 2014 Nov;210(11):746–50. Epub 2014 Jul 1. doi: 10.1016/j.prp.2014.06.022. PubMed PMID: 25041834
31. Shrestha S, Kisino A, Watanabe M, et al. Intestinal anisakiasis treated successfully with conservative therapy: importance of clinical diagnosis. World J Gastroenterol. 2014 Jan 14;20(2):598–602. doi: 10.3748/wjg.v20.i2.598. PubMed PMID: 24574731; PubMed Central PMCID: PMC3923037
32. Kojima G, Usuki S, Mizokami K, Tanabe M, Machi J. Intestinal anisakiasis as a rare cause of small bowel obstruction. Am J Emerg Med. 2013 Sep;31(9):1422.e1–2. Epub 2013 Jun 18. doi: 10.1016/j.ajem.2013.05.015. PubMed PMID: 23786678
33. Juric I, Pogorelic Z, Despot R, Mrklic I. Unusual cause of small intestine obstruction in a child: small intestine anisakiasis: report of a case. Scott Med J. 2013 Feb;58(1):e32–6. doi: 10.1177/0036933012474616. PubMed PMID: 23596037
34. Fujioka N, Mukogawa T, Kunishige T, et al. [A Case of Anisakiasis of the Small Intestine Causing Ileus]. J Nara Med Ass. 2012 Apr;63(1-2):37–42. Japanese.
35. Oshima M, Akamoto S, Kakinoki K, Hagiike M, Okano K, Suzuki Y. [A case of small bowel resection for obstruction caused by anisakiasis]. J Abdom Emerg Med. 2011;31(3):589–92. Japanese.
36. Kang DB, Oh JT, Park WC, Lee JK. [Small bowel obstruction caused by acute invasive enteric anisakiasis]. Korean J Gastroenterol. 2010 Sep;56(3):192–5. Korean. doi: 10.4166/kjg.2010.56.3.192. PubMed PMID: 20847609
37. Fujii S, Nishie M, Hamano R, et al. A surgical case of small intestinal anisakiasis with symptoms of ileus. J Okayama Med Assoc. 2009 Apr;121(1):25–7.
38. Masui N, Fujima N, Hasegawa T, et al. Small bowel strangulation caused by parasitic peritoneal strand. Pathol Int. 2006 Jun;56(6):345–9. doi: 10.1111/j.1440-1827.2006.01970.x. PubMed PMID: 16704500
39. Matsuo S, Azuma T, Susumu S, Yamaguchi S, Obata S, Hayashi T. Small bowel anisakiosis: a report of two cases. World J Gastroenterol. 2006 Jul 7;12(25):4106–8. doi: 10.3748/wjg.v12.i25.4106. PubMed PMID: 16810773; PubMed Central PMCID: PMC4087735
40. Ramos L, Alonso C, Guilarte M, Vilaseca J, Santos J, Malagelada JR. Anisakis simplex-induced small bowel obstruction after fish ingestion: preliminary evidence for response to parenteral corticosteroids. Clin Gastroenterol Hepatol. 2005 Jul;3(7):667–71. doi: 10.1016/s1542-3565(05)00363-0. PubMed PMID: 16206499
41. Couture C, Measures L, Gagnon J, Desbiens C. Human intestinal anisakiosis due to consumption of raw salmon. Am J Surg Pathol. 2003 Aug;27(8):1167–72. doi: 10.1097/00000478-200308000-00017. PubMed PMID: 12883252
42. Maggi P, Caputi-Iambrenghi O, Scardigno A, et al. Gastrointestinal infection due to Anisakis simplex in southern Italy. Eur J Epidemiol. 2000 Jan;16(1):75–8. doi: 10.1023/a:1007617002972. PubMed PMID: 10780346
43. Kano N, Yamada N, Furumura Y, Adachi T, Haeno Y, Wada E, Inada K, Matsunami E, Ikeda Y. [Clinical study on cases of intestinal anisakiasis. Advocation of criteria for early diagnosis]. J Jpn Pract Surg Soc. 1990;51(9):1883–9. Japanese.
44. Appleby D, Kapoor W, Karpf M, Williams S. Anisakiasis: nematode infestation producing small-bowel obstruction. Arch Surg. 1982 Jun;117(6):836. doi: 10.1001/archsurg.1982.01380300076016. PubMed PMID: 7200765

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