

# World Journal of *Clinical Cases*

*World J Clin Cases* 2019 September 6; 7(17): 2413-2657



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**RESPONSIBLE EDITORS FOR THIS ISSUE**

Responsible Electronic Editor: *Yan-Xia Xing*

Proofing Production Department Director: *Yun-Xiaojian Wu*

**NAME OF JOURNAL**

*World Journal of Clinical Cases*

**ISSN**

ISSN 2307-8960 (online)

**LAUNCH DATE**

April 16, 2013

**FREQUENCY**

Semimonthly

**EDITORS-IN-CHIEF**

Dennis A Bloomfield, Sandro Vento

**EDITORIAL BOARD MEMBERS**

<https://www.wjnet.com/2307-8960/editorialboard.htm>

**EDITORIAL OFFICE**

Jin-Lei Wang, Director

**PUBLICATION DATE**

September 6, 2019

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**PUBLICATION MISCONDUCT**

<https://www.wjnet.com/bpg/gerinfo/208>

**ARTICLE PROCESSING CHARGE**

<https://www.wjnet.com/bpg/gerinfo/242>

**STEPS FOR SUBMITTING MANUSCRIPTS**

<https://www.wjnet.com/bpg/GerInfo/239>

**ONLINE SUBMISSION**

<https://www.f6publishing.com>

## Adult intussusception caused by colonic anisakis: A case report

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**Author contributions:** Choi YI, and Park DK contributed to the study concept and design; Choi YI, Cho HY, and Choi SJ analyzed and interpreted the data; Choi YI and Park DK drafted the manuscript; Park DK, Kim KO, Kwon KA, Chung JW and Kim YJ critically revised the manuscript for important intellectual content; all authors approved the final version of the manuscript submitted. All the authors do not declare any conflict of interest.

### Informed consent statement:

Informed written consent was obtained from the patients.

**Conflict-of-interest statement:** The authors declare that they have no conflict of interest.

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## Abstract

### BACKGROUND

Colo-colonic intussusception is an uncommon phenomenon in an adult. Adult intussusception accounts for < 5% of total cases, and the colo-colonic type is < 30% of cases. Although surgical management has been the treatment of choice for intestinal intussusception in adults, because most frequent causes for adult intussusception are malignant in origin, the importance of the roles of preoperative colonoscopic evaluation has recently been emerging.

### CASE SUMMARY

We report an extremely rare case of adult colo-colonic intussusception caused by colonic anisakiasis and successfully treated by endoscopic removal of the Anisakis body. A 59-year-old man visited the emergency department due to 1 day of lower abdominal colicky pain. Abdominopelvic computed tomography (APCT) revealed the presence of mid-transverse colon intussusception without definite necrosis, which was possibly related with colorectal cancer. Because there was no evidence of necrosis at the intussusception site, a colonoscopy was performed to target the colonic lesion and obtain tissue for a histopathological diagnosis. An Anisakis body was found when inspecting the suspicious colonic lesion recorded by APCT. The Anisakis body was removed with forceps assisted by colonoscopy. The patient's symptoms improved dramatically after removing the Anisakis. A reduced colon without any pathological findings was seen on the follow-up APCT. Without any further treatment, the patient was discharged 5 d after the endoscopy.

### CONCLUSION

When colonic intussusception without necrosis occurs in an adult, physician should consider a colonoscopy to exclude causes cured by endoscopy.



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**Manuscript source:** Unsolicited Manuscript

**Received:** May 9, 2019

**Peer-review started:** May 10, 2019

**First decision:** June 21, 2019

**Revised:** June 22, 2019

**Accepted:** July 20, 2019

**Article in press:** July 20, 2019

**Published online:** September 6, 2019

**P-Reviewer:** Ziogas DE

**S-Editor:** Cui LJ

**L-Editor:** A

**E-Editor:** Zhou BX



**Key words:** Intussusception; Anisakis; Colonoscopy; Case report

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**Core tip:** We report an extremely rare case of adult colo-colonic intussusception caused by colonic anisakiasis and successfully treated by endoscopic removal of the Anisakis body. When colonic intussusception occurs in an adult patient and there is no evidence of necrosis of the colon, it is necessary to consider a colonoscopy to exclude causes that can be cured by endoscopy.

**Citation:** Choi YI, Park DK, Cho HY, Choi SJ, Chung JW, Kim KO, Kwon KA, Kim YJ. Adult intussusception caused by colonic anisakis: A case report. *World J Clin Cases* 2019; 7(17): 2536-2541

**URL:** <https://www.wjgnet.com/2307-8960/full/v7/i17/2536.htm>

**DOI:** <https://dx.doi.org/10.12998/wjcc.v7.i17.2536>

## INTRODUCTION

Eating raw marine food is popular not only in Asian countries but also in Europe and the United States, which has allowed parasitic diseases, such as anisakiasis, to emerge worldwide<sup>[1-3]</sup>.

Anisakiasis is a parasitic disorder that occurs after ingesting the larval stages of ascaridoid nematodes<sup>[4]</sup>. Anisakids use aquatic mammals as their definitive hosts, while humans are the incidental host after eating raw marine food infected with Anisakis third-stage larvae<sup>[4,5]</sup>. The disease of anisakiasis presents after direct penetration of larvae into the gastrointestinal wall (invasive) and/or an allergic reaction (noninvasive form)<sup>[6]</sup>. The invasive form of Anisakis larvae is usually found in the mucosa or submucosa of the gastric and small bowel walls, and causes problems, such as nausea, vomiting, hematemesis, and abdominal pain within a few hours after ingesting the larvae<sup>[6]</sup>. Colonic anisakiasis is rare, and induces symptoms that mimic other diseases, such as acute appendicitis, ileitis, diverticulitis, cholecystitis, inflammatory bowel disease, and small bowel obstruction<sup>[7-10]</sup>.

Colo-colonic intussusception is also an uncommon phenomenon in an adult<sup>[11]</sup>. Adult intussusception accounts for < 5% of total cases, and the colo-colonic type is < 30% of cases, while the intestinal type accounts for most of the cases<sup>[11]</sup>.

We report an extremely rare case of adult colo-colonic intussusception caused by anisakiasis, which was successfully treated by a colonoscopic intervention.

## CASE PRESENTATION

### Chief complaints

A 59-year-old male visited the emergency department presenting with new onset left-sided lower abdominal pain.

### History of present illness

He has abdominal pain for 1 day with no febrile sense.

### History of past illness

He has no known medical history.

### Personal and family history

He had no specific personal or family history of cancer or cancer related disease.

### Physical examination on admission

Physical examination on admission revealed that he has upper abdominal tenderness but without rebound tenderness.

### Laboratory examinations

Laboratory findings, including a blood cell count, chemistry, electrolytes, C-reactive protein (CRP), and carcinoembryonic antigen (CEA) levels were within normal ranges (hemoglobin, 12.9 g/dL; white blood cell count,  $7.04 \times 10^3/\text{mm}^3$ ; CRP, 0.04 mg/dL;

and CEA, 0.69 mg/dL).

### Imaging examination

He underwent a contrast enhanced abdominopelvic computed tomography scan (APCT) that showed colo-colonic intussusception in the mid-transverse colon (Figure 1). After an interdisciplinary approach on the part of the radiology, surgery, and gastroenterology departments, intussusception induced by descending colon cancer was highly suspected even though there was no definite evidence of cancer on the APCT, given that the most frequent etiology for adult colo-colonic intussusception is malignancy.

## FINAL DIAGNOSIS

A multidisciplinary team decided on surgery to reduce the intussusception and treat the malignancy. Before the operation, a colonoscopy was done to target the unrevealed malignancy, as there was no definite necrosis around the colonic region with intussusception. During colonoscopic procedures, An approximately 3.0 cm sized Anisakis body, which had penetrated the colonic wall was seen in the transverse colon. The final diagnosis for patient was colo-colonic intussusception caused by colonic anisakiasis.

## TREATMENT

During colonoscopy, an approximately 3.0 cm sized Anisakis body, which had penetrated the colonic wall was seen in the transverse colon (Figure 2). The Anisakis body was removed with biopsy forceps and carried to the pathology department. The final tentative diagnosis was colonic Anisakis (Figure 3).

## OUTCOME AND FOLLOW-UP

After removing the Anisakis body by colonoscopy, the patient's symptoms and lower abdominal pain completely resolved and did not require further intervention. A subsequent APCT showed successful reduction of the endoscopic intussusception (Figure 4). Without any further treatment, the patient was discharged 5 days after the endoscopy. After 6month follow up, all of the patient symptom and signs have been alleviated.

## DISCUSSION

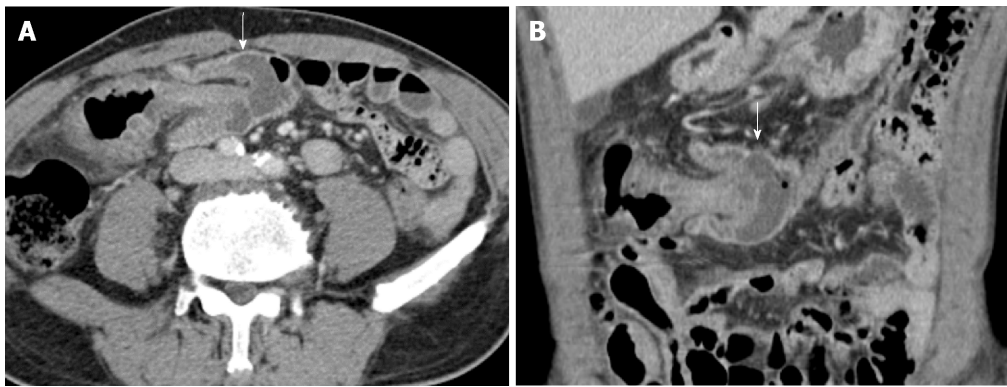
In this study, we report an extremely rare case of colo-colonic intussusception in an adult that occurred due to colonic Anisakis and was cured by endoscopic removal of Anisakis larvae.

Adult intestinal intussusception is a rare disease, which accounts for only 5% of all cases of intussusception<sup>[12]</sup>. Furthermore, colo-colonic intussusception is rarer than small bowel intussusception, and accounts for < 30% of cases<sup>[12]</sup>. The most common site for colo-colonic intussusception is the proximal colon, and colo-colonic intussusception in the transverse colon is particularly rare<sup>[11]</sup>.

Cases of intestinal intussusception in adults and children differ in a number of aspects, including incidence, etiology, and treatment<sup>[12]</sup>. While child intussusception includes almost 95% of all intussusception cases, adult intussusception accounts for < 5% of all cases. It is the most common cause of obstruction in infants but is extremely rare in adult and accounts for < 1% of cases. While child intussusception is usually of the primary type, adult intussusception is always secondary to a benign or malignant intestinal neoplasm, stricture, or diverticulum<sup>[11]</sup>. Intussusception in children is usually treated with supportive care or a contrast enema, whereas 70–90% of adult intussusceptions often require definitive treatment and surgical resection as adult intussusception is generally secondary to a benign or malignant neoplasm, diverticulum, or stricture. In this case, a rare colo-colonic intussusception occurred caused by colonic anisakiasis<sup>[13]</sup>.

Intestinal anisakiasis is a parasitic disease of the gastrointestinal tract. Nematodes in the Anisakidae family cause anisakiasis<sup>[14]</sup>. Humans are the incidental host in the life cycle after eating raw or uncooked fish containing Anisakis larvae<sup>[14]</sup>. In this regard, intestinal anisakiasis is prevalent in Asian countries where sushi or raw fish is





**Figure 1** Pre-treatment abdominopelvic computed tomography. A and B: Axial and coronal reformatted images of contrast-enhanced computed tomography show a colo-colonic intussusception with subepithelial edema in mid transverse colon (white arrows). There is no evidence of visible tumor at intussusception in computed tomography.

popular.

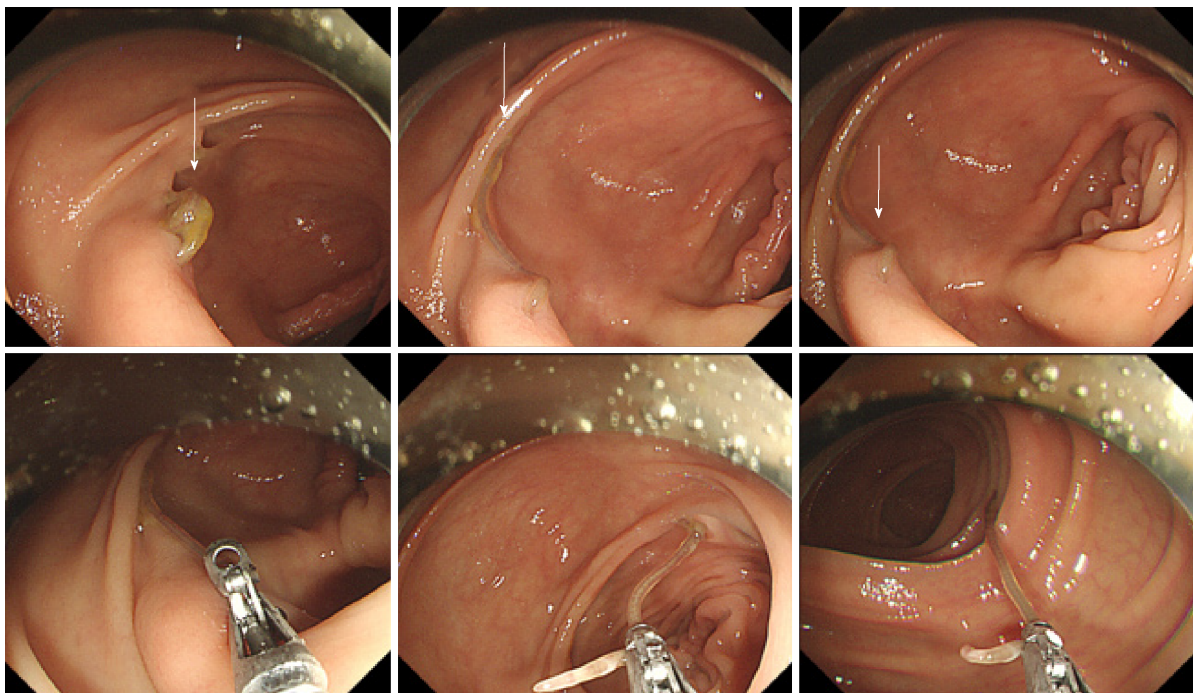
The mechanism that precipitates intestinal intussusception is unclear. It has generally been accepted that an injury or irritation of the intestinal wall can alter normal peristalsis of the intestine related with the process of invagination<sup>[13]</sup>. Colonic Anisakis is a cause of wall injury, particularly when the Anisakis larva penetrates the colon wall; therefore, colonic Anisakis is a cause of colo-colonic intussusception even though colonic Anisakis is extremely rare. In this case, colonic Anisakis may have been the cause of the colo-colonic intussusception, as the patient's symptoms were relieved and the colonic intussusception was reduced after removing the larva<sup>[7,13]</sup>.

In contrast to previously reported cases, colo-colonic intussusception in this case was successfully resolved by endoscopic reduction in an acute setting (< 24 h), and the cause of the intussusception was promptly diagnosed. Surgical management has been the treatment of choice for intestinal intussusception in adults, because most frequent causes for adult intussusception are malignant in origin. However, a preoperative colonoscopy should be carefully considered especially for cases with no evidence of necrosis of colon in initial imaging study to detect the cause which may be amenable to endoscopic intervention and to avoid an unnecessary surgical procedure. In this case, colo-colonic intussusception, without any evidence of colonic necrosis on the initial image studies including abdominal pelvic computed tomography, was successfully resolved by endoscopic reduction in an acute setting (< 24 h). Further studies comparing endoscopic (or preoperative diagnostic endoscopy) and surgical procedures on long-term outcomes are needed.

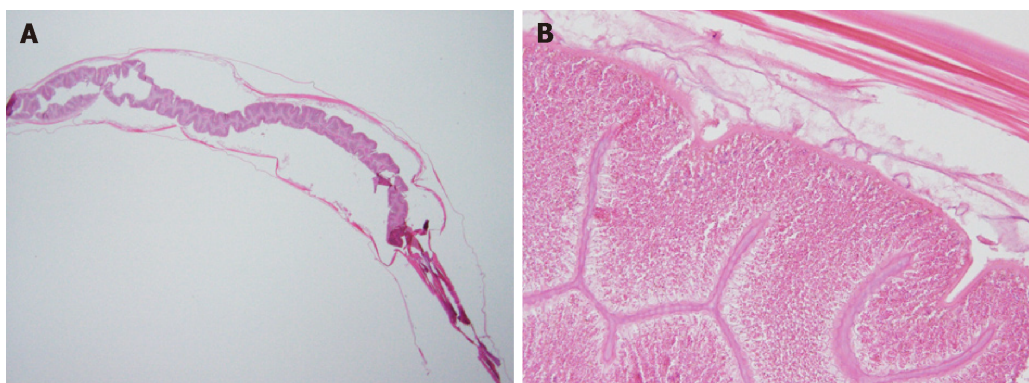
The treatment of choice for anisakiasis is endoscopic removal of the nematode, and the clinical symptoms usually stop<sup>[15]</sup>. In this case, the patient's symptoms were relieved after endoscopic removal of the Anisakis larva<sup>[15]</sup>. However, chronic cases with the evidence of the infected lesions on intestine should be considered surgical resection, and administration of tribendazole even though it is ineffective<sup>[16]</sup>.

## CONCLUSION

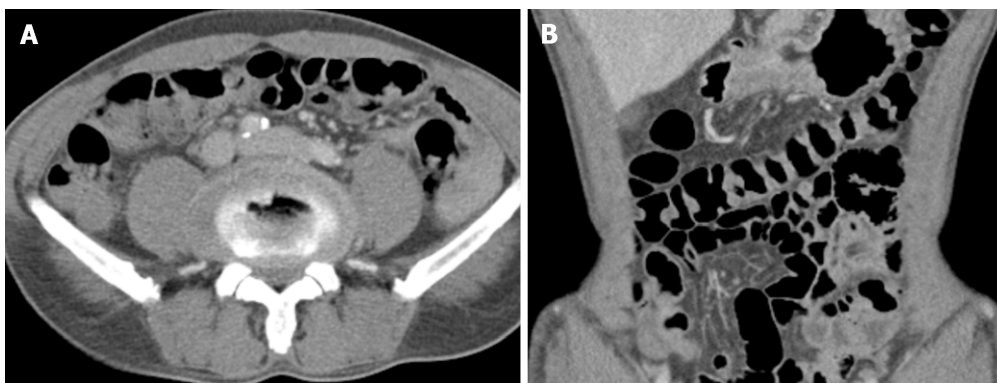
In conclusion, when colo-colonic intussusception occurs in adult patients, and without definite evidence of necrosis in the intestinal tract, a colonoscopy should be considered to exclude the cause that could be cured by endoscopy and to avoid an unnecessary surgical procedure. Further studies comparing endoscopic (or preoperative diagnostic endoscopy) and surgical procedures on long-term outcomes are needed.



**Figure 2** Series of endoscopic image of descending colon demonstrating biopsy forceps removing *Anisakis simplex* (arrow).



**Figure 3** Histopathologic images of the *Anisakis* body. Histopathological findings of the specimen. A: Longitudinal section of *Anisakis* larva. The nematode is 2.9 cm in length and 0.1 cm in width (hematoxylin and eosin stain;  $\times 12.5$ ); B: High magnification showing cuticle and intestine ( $\times 200$ ).



**Figure 4** Post treatment abdominopelvic computed tomography. A and B: After removal state of parasite, repeated computed tomography images demonstrate the disappearance of colo-colonic intussusception.

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