

## CASE REPORT

# Unusual oral expulsion of adult *Taenia* worm through vomiting

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**Abstract**

A 49-year-old woman with a history of abdominal discomfort and raw beef intake vomited a long adult *Taenia* after an episode of acute febrile illness. This case report describes that Taeniasis can rarely present with oral expulsion of the tapeworm. Acute physiologic stress due to illness or surgery could be implicated.

**KEYWORDS**

oral expulsion, *Taenia*, Taeniasis, tapeworm, vomiting

## 1 | INTRODUCTION

*Taenia* species are common tapeworms that cause human infections. *Taenia saginata* (Beef tapeworm) and *Taenia solium* (Pork tapeworm) are the two main species of *Taenia* for which humans are the only definitive host. *Taenia* infections are estimated to affect 100 million people worldwide with major endemic areas located primarily in developing countries.<sup>1</sup> *Taenia saginata* occurs in areas where cattle are raised and raw or undercooked meat is eaten. *Taenia solium* can be transmitted by ingesting cysticerci-infected pork.<sup>2</sup> Both species can cause taeniasis, an infection with the adult tapeworm which usually remains confined to the small intestine. Only *T. solium*, however, can cause cysticercosis in humans. Cysticercosis refers to infection of tissues, such as muscles or brain, caused by the larval stage of the tapeworm.

Upon ingestion of an infected raw or undercooked beef (in *T. saginata*) or pork (in *T. solium*), the infective larval stage (cysticerci) in the meat releases the scolex (head) of the tapeworm in the host's intestine. The scolex attaches to the intestinal wall (upper jejunum) and develops into an adult in 2-3 months by growing a chain of segments, called proglottids, which collectively make up the body of the tapeworm, named strobilia. This adult worm can

survive up to 25 years, and, particularly, *T. saginata* can attain an exceptional length of 25 meters.<sup>1</sup> The usual length, however, is 4-12 meters for *T. saginata* and 1-5 meters for *T. solium*.<sup>2</sup> Mature proglottids are released from the tapeworm's posterior end and leave the host in stool (*T. solium*) or spontaneously (*T. saginata*). The intermediate hosts acquire the infection when they ingest the eggs or proglottids and develop the larval stage that can infect humans, completing the cycle.

Taeniasis due to *T. saginata* is usually asymptomatic. The most common symptom is an active passage of proglottids through the anus. Proglottids of *T. saginata* are mobile and migrate out of the host's anus spontaneously, usually in small segments, or are shed daily in feces.<sup>2</sup> Each *T. saginata* segment crawls actively as an individual worm searching for something<sup>3</sup> presumably for its cattle host. Other usual symptoms are abdominal pain, dyspepsia, weight loss, nausea, dizziness, sleep disturbance, and perianal discomfort.<sup>4</sup> Oral expulsion of the tapeworm is rare.<sup>5</sup> There are very few case reports in the literature that have documented this unusual route of expulsion in various clinical circumstances. This case report describes an oral expulsion of an adult taenia worm through vomiting in a 49-year-old female patient who had associated medical illnesses.

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## 2 | CASE REPORT

A 49-year-old woman presented to the emergency room with a chief complaint of “I am vomiting up my intestines since yesterday.” Her history of present illness dates back to approximately one year prior to presentation, when she started to experience nonspecific abdominal pain. She also complained of loss of appetite, dyspepsia, nausea, weight loss, and at times dizziness. Upon investigation of her presenting complaints in another hospital, she was found to have gallstones and underwent cholecystectomy five months back but she denied any relief to her abdominal pain or other symptoms.

Over the past five months before her presentation, her symptoms were gradually worsening. She repeatedly presented to the outpatient department with similar complaints and her serologic examination was found to be positive for *Helicobacter pylori* infection, a common bacterial infection causing dyspepsia. Hence, she had been on several antacid medications, with the recent being a regimen of triple therapy (a proton pump inhibitor and two oral antibiotics) for *Helicobacter pylori* eradication completed three weeks before her emergency presentation.

The patient had been ill for the last two weeks period preceding her initial presentation to the emergency department with fever, arthralgia, and anorexia, which was diagnosed to be dengue fever and managed supportively. She presented again with epigastric pain, severe nausea, and vomiting of three days duration. She described that she had passed a total of one meter of her “intestine” in pieces in stool over the last three days associated with vomiting of various such segments on the last day. She brought the longest part (~ 1.5 meters) she vomited in a bag. The entire length of the expelled segments was estimated to be 4.5 meters in total. The patient stated that she had poor appetite during those two weeks and was almost fasting for the last two days.

Upon direct questioning, the patient recalled an intake of raw beef about 18 months back in a social event - a relatively common local tradition. She denied any history of eating or even tasting pork.

The physical examination of the patient was unremarkable except for mild epigastric tenderness. Visual inspection of the vomitus brought by the patient from home in a bag was found to be a long segment of tapeworm proglottids. Vomiting of the proglottids was witnessed in the emergency room as shown in Figure 1. Scolex of the tapeworm could not be identified in those expulsions. Laboratory examinations for complete blood count showed white blood cell count of  $3.0 \times 10^3/\mu\text{L}$ , hemoglobin 13.6 g/dL, and platelet of  $196 \times 10^3/\mu\text{L}$ . An elevation in eosinophil count was not reported. Parasitological analysis of the stool detected eggs of *Taenia* species and



**FIGURE 1** Vomitus of the patient containing *Taenia* proglottids

*Giardia* trophozoites. The expelled proglottids were sent to the parasitology laboratory and evaluated microscopically, reporting gravid proglottids of *T. saginata* species. The patient was admitted with the diagnosis of taeniasis secondary to *Taenia saginata* infestation and given intravenous fluid with 10 mg metoclopramide for the nausea and vomiting. A single dose of 600 mg praziquantel was administered. Metronidazole 500 mg twice daily was also started for the incidental giardiasis. The patient reported instantaneous relief of symptoms and denied any passage of the adult tapeworm segments or proglottids neither through vomiting nor per rectum after the treatment. She described vomiting creamy contents in the first of her two-day stay in the ward. The patient was followed up in the outpatient department for seven months (assessed at one month, three months, and seven months), and she had no any complaint. She denied passage of proglottids or abdominal pain. Control stool examinations were done in each of the follow-up visits and were negative for ova and parasites. The patient provided written informed consent for publication of the details of her case.

## 3 | DISCUSSION

Taeniasis is a helminthic infection that occurs in areas where raw or undercooked meat is commonly ingested. This patient with a history of raw beef intake suffered nonspecific abdominal complaints for almost a year that was not relieved by several medical and surgical treatments for alternative diagnoses. The root cause of her symptoms was delineated upon her last presentation to the emergency department with chiefly per oral expulsion of an adult tapeworm on top of those passed with stool and spontaneously out of the anus. Vomiting up a tapeworm

is unusual in our clinical practice and hardly mentioned in textbooks.

There are few reports of such occurrences in the literature.<sup>4-9</sup> Although the elimination of the worm per oral is a shared presentation, each case report shows a unique clinical situation when such an expulsion had occurred. Owing to its attachment to the intestinal wall by the scolex and the strong gastric acidic milieu, the tapeworm is not expected to reach the stomach. Nevertheless, upper gastrointestinal endoscopy for chronic dyspepsia has accidentally detected the worm in the stomach<sup>10-11</sup>.

The exact mechanisms that lead to the oral expulsion are not elucidated. Some speculations, however, are given. Adam<sup>6</sup> reports that expulsion of *T. saginata* occurred after a fasting day and he entertains the possibility of the parasite wandering around to search for food. Shafagi *et al*<sup>10</sup> believe that the retrograde migration of the tapeworm into the stomach may be due to low gastric acidity as a result of gastritis and chronic proton pump inhibitor use. This case presented both with fasting due to anorexia and a history of acid-lowering drugs for *Helicobacter pylori* infection, supporting the plausibility of both suggested speculations.

Scrutiny of the case reports on oral elimination of *Taenia* species shows that the oral expulsion happened in the immediate postoperative period in many of the cases.<sup>4,5,9,12</sup> The actual association with the operation is unclear. Postoperative nausea and vomiting are, however, common in the immediate postoperative period in which the retrograde peristalsis could drive the attached tapeworm into the oral cavity. Association with acute febrile illness is not previously reported. The underlying anorexia, nausea, and vomiting inherent to the acute febrile illness might have destabilized the tapeworm and provoked its expulsion in this case. There are reports of finding *Taenia* species in the biliary tract and gallbladder.<sup>13</sup> The history of recent cholecystectomy in my patient, however, does not seem to be associated with such instances as there was neither relief of symptoms after surgery nor report of intraoperative parasite finding.

Following her treatment with praziquantel, the patient in this case did not pass any proglottids orally or per rectum. Instead, she reported vomiting creamy contents in the first few days. Owing to its cestocidal activity, praziquantel renders the tapeworm lose the ability to resist digestion by the host. For this reason, the whole tapeworm including the scolex is rarely passed after praziquantel therapy.<sup>14</sup> Often, only disintegrated and partially digested parts of tapeworm are found in the stool. Therefore, the creamy vomitus in this patient could be digested pieces of the tapeworm and the absence of the passage of proglottids including the scolex after treatment probably indicates the effect of praziquantel.

Although oral expulsion of *Taenia* tapeworm might have been seen repeatedly in endemic areas, there is a scarcity of scientifically reported cases of such an occurrence. A remarkable gap of information on the oral expulsion of *Taenia* exists in relevant textbooks and journals. The patient suffered nonspecific abdominal discomfort for more than a year and taeniasis was not considered as a probable cause even though a simple questioning for the expulsion of tapeworm proglottids can detect *T. saginata* infection in 90% of the cases<sup>2</sup> while a history of ingestion of undercooked beef may serve a significant adjunct. Therefore, a high index of suspicion is required to detect the tapeworm infection before the possible occurrence of this startling, and presumably confusing, oral expulsion of the parasite.

Irrespective of the exact *Taenia* species involved, the unusual oral expulsion of the tapeworm especially being preceded by associated medical and surgical conditions in this patient is believed to impart a helpful clinical as well as a scientific lesson. Apart from the essential parasitological laboratory examinations done for clinical decision-making, a detailed examination of the *Taenia* proglottids such as molecular techniques or serological evaluation for definitive scientific confirmation of the species was not conducted due to the lack of such investigations in the setup—a common scenario in poor settings where the disease is endemic. Unfortunately, no photographs of the detected *Taenia* eggs in stool or the microscopic appearance of gravid proglottids were taken. However, based on the clinical history of the active passage of proglottids per anum, length of the tapeworm, and history of raw beef but not pork ingestion, endemicity of the infection and the reported laboratory findings, taeniasis due to *T. saginata* is quite probable in this case.

## 4 | CONCLUSION

The key message of this case report is to bring the rare occurrence of oral expulsion of an adult tapeworm into the attention of clinicians who may possibly encounter such a strange presentation and this report does not aim at providing detailed expulsion biology of the exact *Taenia* species involved. All necessary precautions should be undertaken when *T. solium* is suspected as the eggs are infective and can cause the serious condition of human cysticercosis. In addition, this case report and the associated clinical circumstances described can also stimulate biologists to investigate the possible mechanism of this uncommon oral expulsion of the adult tapeworm. Oral expulsion of *Taenia* is rarely mentioned in parasitological or medical textbooks. Therefore, this case report along with the few in the literature would be sufficient evidence to incorporate the possibility of oral expulsion of the adult

tapeworm as a probable presentation in standard texts so that clinicians get familiar with and expect such an event in their day-to-day clinical practice.

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Not applicable.

### CONFLICTS OF INTEREST

The author declares that he has no competing interests.

### AUTHOR CONTRIBUTIONS

Saud Mohammed Raja first encountered the case in the emergency room, entertained the diagnosis, took the lead in the management of the patient, did the photography, and wrote the manuscript.

### CONSENT

Written informed consent was obtained from the patient for publication of this case report and the related photograph.

### DATA AVAILABILITY STATEMENT

Data sharing is not applicable to this article as no new data were created or analyzed in this study.

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