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Case report

Intestinal perforation and peritonitis due to *Taenia saginata*: A case report from Iran

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ABSTRACT

Taenia saginata (T. saginata) is one of the most common cestode in human. We report a case of intestinal perforation caused due to *T. saginata* infection. The patient, 54-year-old female, had intermittent abdominal pain, diarrhea and vomiting on referral. Intestinal obstruction and perforation leading to necrosis, and volvulus due to an impacted tapeworm was observed. Histopathological examinations showed acute inflammation with mucosal ulceration, and luminal exudates accompanied by an elongated and flattened segment of the helminth. *Taenia* infections should be considered in differential diagnosis of peritonitis and gastrointestinal tumors, particularly in endemic countries including Iran.

1. Background

Helminth infections are an important public health problem in tropical and underdeveloped countries [1]. The adult stage of *Taenia saginata (T. saginata)* is one of the most common pathogenic cestode in human. This tapeworm is transmitted by eating raw beef [2]. Infected individuals might remains asymptomatic for years, and just the symptom may be only the impulsive passage of proglottids. However, nonspecific symptoms, such as vague abdominal pain, nausea, vomiting, diarrhea, and weight loss, may be present [3]. The tapeworm seems can lead to serious surgical gastrointestinal system complications that rarely reported in the medical literature [4–7]. Intestinal perforation is a quite rare complication in parasitic diseases [5]. Herein, we report a case of intestinal perforation caused due to *T. saginata* infection. The work has been reported in line with the SCARE criteria [8].

2. Case presentation

A 54-year-old female, in July 2012, was presented with complaining intermittent abdominal pain, diarrhea, vomiting, and loss of appetite in Hakim Jorjani hospital in Gorgan, Golestan Province, northeastern Iran. She suffered from the abdominal and epigastric pains for 6 years, exacerbated after meal. The patient complained of bloody stool for the last 4 months. She had a history of eating undercooked beef. In physical examination, abdominal distention and hyperactive bowel sounds are presented. The patient had no fever but generalized abdominal tenderness was elicited upon palpation, which was markedly observed on lower left abdominal quadrant. Pelvic examination did not reveal any abnormality. Laboratory parameters showed increases WBC count 18.2×10^3 ml with 6% eosinophilia. Stool examination was negative for both eggs and proglottids of *T. saginata*. On abdominal ultrasonography, pathologic findings were not observed. The abdominal CT scan indicated the presence of two huge lobulated masses measuring about 17 cm × 12 cm × 7 cm and 14 cm × 9 cm × 4 cm in retroperitoneal space.

During abdominal laparotomy, intestinal adhesiveness at the distal jejunum and ileum along with fibrin and pus excretion and two mass with the distance of 30 cm was observed. In addition, the parasite was not completely removed and scolex remained at the proximal and 130 cm of the worm was removed. Thus, the patient treated with a single dose of 10 mg/kg orally of praziquantel.

Histopathological findings showed acute inflammation with mucosal ulceration, and luminal exudates accompanied by an elongated and flattened segment of the helminth. Using parasitological examinations, a large number of round eggs within the mature gravid proglottids were observed. These characteristics identified that the helminth

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related to the genus *Taenia* spp. Nevertheless, the eggs of both *Taenia* (*saginata* and *solium*), are morphologically equal, but based on the number of lateral uterine branches of gravid proglottids, which *T. saginata* with 12–30, while *T. solium* with 7–13 lateral uterine branches, the species was identified as *T. saginata*.

Cytological findings of the small intestine showed myxoid changes; however, tumor markers were negative.

The patient was candidate for urgent abdominal laparotomy again 10 months after first laparotomy due to peritonitis. Nevertheless, after surgery the patient developed respiratory-heart failure, and then died in the Intensive Care Unit (ICU). The consent for publication was given from her son.

3. Discussion

To the best of our knowledge, this is the first report of intestinal perforation due to *Tanenia* spp from Iran. To date bowel perforation due to a variety of helminth infections such as ascariasis, angiostrongyliasis, enterobiasis, trichuriasis, schistosomiasis, acanthocephaliasis, taeniasis and strongyloidiasis have been reported worldwide [9–13]. Among helminth infections, ascariasis is frequently responsible for intestinal obstacles than taeniasis, for the reason that ascariasis can lead to the intestinal obstruction, appendicitis, pancreatitis, biliary lesions, and peritonitis in children [2].

Taenia infection usually is diagnosed by identifying eggs or proglottids in the stool and cellophane-tape swab to detect eggs as early as about three months after infection. Eosinophilia and elevation of serum IgE may be present. Serological tests are not routinely performed. PCR-based methods, providing definite diagnosis and species discrimination [2,4,5].

Present situation of human taeniasis in Iran indicate that *T. saginata* have a distribution through whole the country. However, it is more common in northern Iran [14], particularly in the areas where traditional cattle husbandry is widespread. Our patient was from the Golestan Province, northeastern Iran, in which taeniasis caused by *T. saginata* is endemic, and the prevalence of the human taeniasis in the province is estimated to be about 1% [15].

The most complications of taeniasis are including abdominal pain, obstruction, inflammation, and perforation of small intestine, appendix, and colon [4]. There is no clearly described cause of perforation; however, physical obstruction due to long strobila (a chain of segments) of *Taenia* and intestinal inflammation is the most extensively established hypothesis [7]. Because of local inflammatory reactions and or volvulus due to an impacted tapeworm, bowel perforation and consecutive peritonitis may be occur [7]. This mechanism is encouraging in the small intestine, particularly in the ileocecal valve where luminal thickness is thin and parasite - mucosa contact will probably occur [2]. Thus, a fewer complications of taeniasis is predictable in the large bowel. However, a case of colonic perforation due to *Taenia* spp has been reported from Turkey, which it misconstrued as colorectal cancer using ultrasonography technique [4]. In general, there are only two reports of jejunal perforation due to *T. saginata*. First case occurred in a 32-year-old female with unusual morphology of the parasite from Thailand [5]. In this case, *T. saginata* was confirmed using sequence analysis of the mitochondrial cytochrome *c* oxidase I (cox I) gene and the 28srRNA gene. In addition, recently second case, which misdiagnosed preoperatively as acute duodenal ulcer perforation, was reported in a 69-year-old male from Lebanon [16].

Although, large and small intestinal perforation due to *Taenia* infections especially *T. saginata* was extremely rare, taeniasis should be considered in differential diagnosis of peritonitis and mesenchymal neoplasm of the gastrointestinal tract, for example, gastrointestinal stromal tumors (GISTs) particularly in endemic areas such as northern Iran.

However, the cause of existence two masses in the small intestine of our patient is unknown even though all tumor markers were negative. As a whole, there is no evidence regarding association between taeniasis and intestinal tumors in the literature. Hence, it appears that this unusual condition is extremely rare.

In conclusion, bowel infection with *Taenia* remains an important public health problem in many countries, especially in tropical and subtropical countries. The majority of the patients are asymptomatic and do not have serious signs. Subsequently, it should be on the list of differential diagnosis of intestinal perforation in the intestinal tracts of the individuals with poor hygiene and inhabitants in the rural areas.

4. Learning points/Take home messages

1. Past medical history and accurate parasitological tests can play a role for the early diagnosis of small bowel obstruction.
2. *T. saginata* remains an uncommon cause of small bowel perforation and peritonitis but an important one given the high mortality associated.
3. *Taenia* infection should be considered in differential diagnosis of peritonitis and gastrointestinal tumor.

Ethical approval

Hakim Jorjani hospital in Gorgan.

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Author contribution

Study concept: Mahdi Fakhar.

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Conflicts of interest

All authors declare that they have no conflicts of interest.

Guarantor

Masoud Soosaraei, Mahdi Fakhar, Shahriar Alizadeh.

Consent

After death of patient, the informed consent for publication was given orally from her family.

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