

## Incidentally observed 15-meter-long tapeworm during surgery in a patient with newly diagnosed gastric cancer

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### ABSTRACT

Parasitic infestations are mostly encountered in underdeveloped or developing countries. *Taenia saginata* is the most frequently found genus in Turkey and cases occur particularly in the Southeastern Anatolian Region. A 57-year-old woman admitted to hospital with the complaints of weakness, weight lose and abdominal pain. Gastroscopy was performed and a tumoral mass was observed. Pathologic evaluation of the endoscopic biopsies was reported as signet ring cell gastric carcinoma. Tapeworm was incidentally observed when the incision was made for jejunal bypass. Fifteen-meter-long parasite was extracted. There are not enough studies and case reports that questioned the relationship between *taeniasis* and cancer.

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**Keywords:** *Taenia saginata*; gastric cancer; asymptomatic; surgery.

### Introduction

Parasitic infestations are mostly encountered in underdeveloped or developing countries. The natural definitive host of these tapeworms (*Taenia solium* and *Taenia saginata*) is human small intestine. Pig and Cattle being intermediate hosts for *T. solium* and *T. saginata* respectively [1]. *T. saginata* is the most frequently found genus in Turkey and cases occur particularly in the Southeastern Anatolian Region. There are very few cases of *T. solium* due to prohibition of pork consumption by the religion in Turkey.

*T. saginata* is transmitted to humans through uncooked or improperly cooked beef. While most cases are asymptomatic patients may have cramp-like abdominal pain, diarrhea or constipation. *Taenia*-related surgical complications include complications include Meckel's, acute appendicitis, cholecystitis, liver abscess, pancreatitis, obstruction and perforation of the intestine, and anastomotic leakage [2].

We report an interesting case of 15-meter-long tapeworm, which is diagnosed during surgery of the newly diagnosed gastric cancer.

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## Case Presentation

A 57-year-old woman admitted to hospital with the complains of weakness, weight lose and abdominal pain. Physical examination is normal except mild epigastric tenderness. Her hemoglobin was 12.2 g per 100 ml, total leucocyte count was 8,200 cells per cubic millimeter (mm<sup>3</sup>) of blood, with a differential count revealing 68.9% neutrophils, 1.6% eosinophils, 21 % lymphocytes and 6.9% monocytes. The platelet count was 407,000/mm<sup>3</sup>. Erythrocyte sedimentation rate was 19 mm/hr.

Gastroscopy was performed due to epigastric findings and reflux symptoms. A passage narrowing tumoral mass was identified at the point that Z line should be existed. The mass that fills the stomach lumen was extending through the distal corpus at the greater curvature side. Multiple endoscopic biopsy was performed.

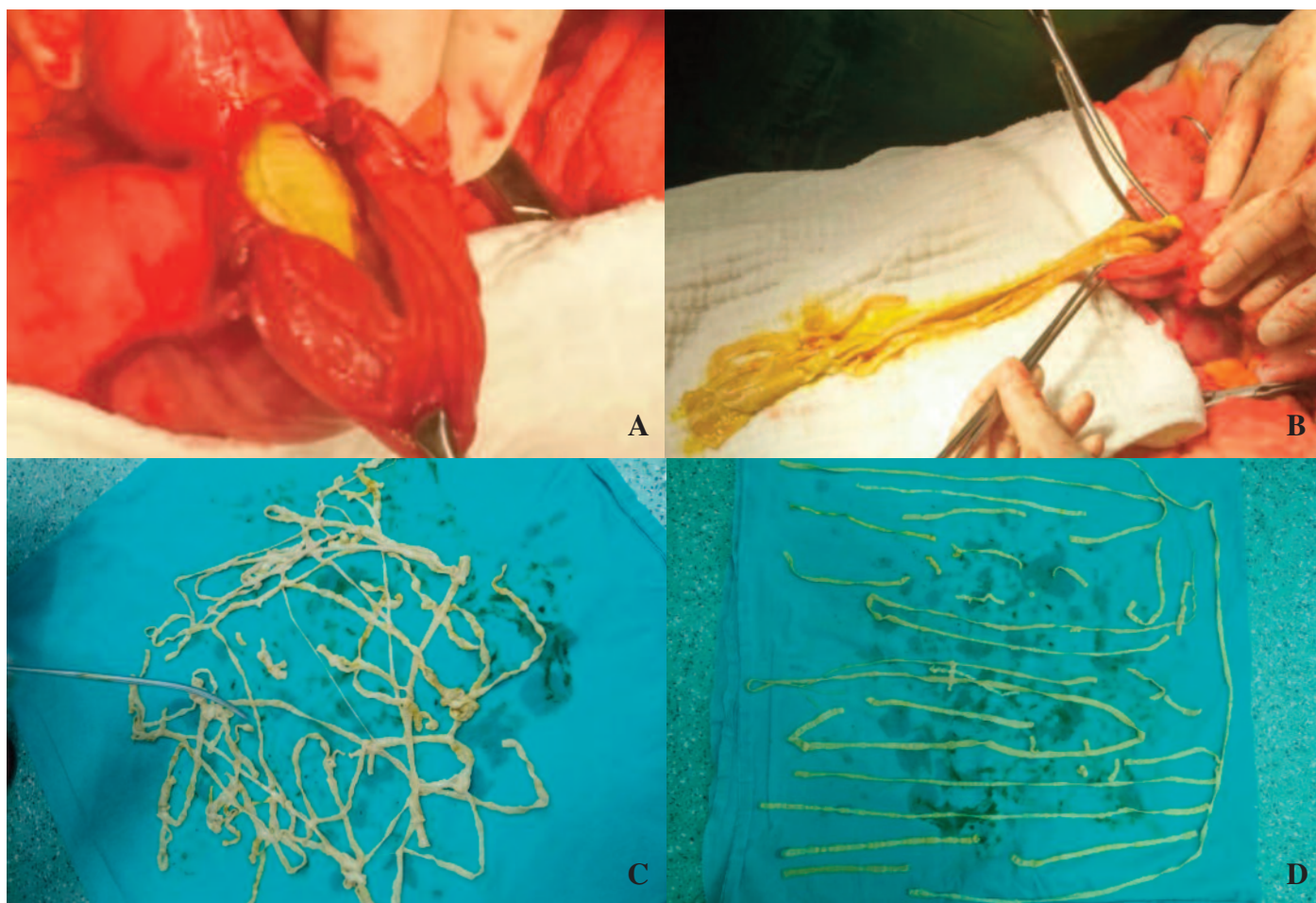
Staging tests were performed due to endoscopic findings. Tumor markers including carcinoembryonic antigen (CEA), cancer antigen 125 (CA 125), CA 15-3, CA 19-9 and alfa-fetoprotein (AFP) was all

negative. Kidney (urea, creatinine and urinalysis) and liver (AST, ALT, ALP, GGT, Bilirubin and PT, INR) function tests were within normal limits. In complete abdominal tomography (CAT), at the thickest part, 22 mm nodular thickening was observed at the level of cardia, greater and small curvature. No lymph node, liver or distant metastasis was noted in thorax and CAT scan.

Pathologic evaluation of the endoscopic biopsies was reported as signet ring cell carcinoma. The patient was discussed at the gastrointestinal oncology council and it was decided to do surgery.

Total gastrectomy was performed. Tapeworm was observed when the incision was made for jejunal bypass 35 cm below the Treitz ligament. Fifteen-meter-long parasite was extracted from 1 cm incision. Remaining part of tapeworm was extracted from the secondary incision 35 cm prior the caecum (Figure 1).

Postoperative pathological evaluation reveals signet ring cell carcinoma of 9x7 cm diameter and 1 cm depth. Subserosa was infiltrated by the tomor. One



**Figure 1.** Appearance of tapeworm from 1-cm incision that was made for jejunal bypass 35 cm below the Treitz ligament (A), extraction of the tapeworm (B), and removed *Taenia saginata* (C, D).

lymph node and 2 omental tumor implantation was observed. Pathological staging was PT<sub>2b</sub>N<sub>1</sub> tumor.

## Discussion

*T. saginata* infestations are usually asymptomatic for a long period of time. Abdominal pain, weight loss, nausea, vomiting, constipation or diarrhea and intestinal obstruction are the symptoms that can be seen in some patients. It is usually treated with a single dose of Praziquantel or Niclosamide.

Surgery is recommended only for the treatment of complications [2]. There are only a few cases describing surgery requiring tapeworm complications. Gall bladder perforation [3], colonic anastomotic leakage following a right hemicolectomy procedure related to *T. saginata* infestation [2], emerging of a tapeworm from the eviscerated midline incision in a post-surgery patient [4] and a case report describing a *T. solium* peritonitis with multiple ileal perforations [1] were reported in the literature.

The effects of parasites are not clear in gastric tumor progression [5]. Serologically, toxocaris infestation was detected in gastric and colorectal cancer patients [6]. Microfilaria was reported in a patient with gastric carcinoma [7]. Although the association is considered to be low, *Tropheryma whippelii* has been strongly associated with gastric adenocarcinoma [8].

Inflammation and cancer relationship is well established. Interactions between various immune cells, and other mediators can lead to signaling toward tumor cell proliferation, growth, and invasion [9]. Chronic tapeworm infestation may increase inflammatory response.

Our case reveals that tapeworm infestations can be asymptomatic although it is 15-meter long. Dural et al. [4] removed 2.4-meter-long taenia in a patient with stage IV gastric cancer. There are not enough studies and case reports that questioned the relationship between taeniasis and cancer.

## Conclusion

The relationship between taeniasis and gastric cancer should be enlightened with the detailed retrospective analysis and prospective studies. The underlying mechanism of tumor development still needs to be investigated.

### Informed Consent

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

### Conflict of interest

The authors declared that there are no potential conflicts of interest with respect to the research, authorship, and/or publication of this article.

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