APPENDICULAR TAENIASIS: ASSOCIATION WITH ACUTE GANGRENE APPENDICITIS IN ISFAHAN, IRAN

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Abstract. In the present study, excised human appendices in Isfahan Medical University Teaching Hospitals, Iran related to 1993-2002, were analyzed and their pathological findings determined. Among 2,379 surgically resected appendices, two cases of appendicular taeniasis were observed. In one case, *Taenia* eggs and segments were found in the lumen associated with acute gangrene appendicitis. In the second, eggs of *Taenia* were present in the lumen of an appendix with reactive follicular hyperplasia.

INTRODUCTION

Taenia saginata and *Taenia solium are* cyclophyllidean tape worms that spend their adult stages in human intestines. Cattle and pigs are intermediate hosts for *T.saginata* and *T.solium*, respectively. Human acquires taeniasis following ingestion of raw or undercooked meat of intermediate hosts containing cysticercus larva. The gravid proglottids of the strobila, which are filled by *Taenia* eggs, become detached and excreted in human feces. If gravid proglottids or their eggs lodge in the appendiceal lumen, they may initiate appendicitis. However, *Taenia* infestation of the appendix is rare, and there have been only isolated clinical case reports during the past 30 years (Lejbkowicz *et al*, 2002).

In the current study, during an analysis of resected appendices in Isfahan Province, Central Iran, two cases of *Taenia* infestation of the appendix were isolated and their pathological reactions determined.

MATERIALS AND METHODS

The materials for the present study were surgically excised appendices in Isfahan University Teaching Hospital. The appendices were divided into two groups, as follows:

1) a total of 879 from the period February 2001 to September 2002. All were preserved in 10% formalin and then, using conventional histological methods, 5 µm sections of each appendix tissues were prepared and stained by hematoxylin and eosin (H&E).

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2) 1,500 appendices from the period 1993 to February 2001; the results of tissue examinations and pathological findings were recorded. The H&E stained glass slides and paraffin embedding blocks were accessible.

Histopathological examinations were carried out on all 2,379 appendix sections and their pathological findings and any infestation with *Taenia* were recorded.

RESULTS

Microscopical examination of 879 appendices (group 1) stained with hematoxylin-eosin, revealed the presence of *Taenia* eggs within the lumen of the appendix in one case. Additional cross-sections through this appendix demonstrated *Taenia* proglottids and eggs (Figs 1, 2). Histopathological examination of the sections revealed a picture of a perforated appendix. Necrosis of the mucosa and all the wall, fibrin sediments, hemorrhage, and neutrophil infiltration in the wall were observed. The tissue reaction was identified as acute gangrenous appendicitis. This appendix was from a 40-year-old Muslim woman, from Isfahan. She had epigastric pain and clinical symptoms and signs of acute appendicitis when admitted to hospital.

Among the second group of appendices, one out of 1,500 tissues was found infested with the *Taenia* eggs. The eggs were observed in the lumen of the appendix. It contained only normal fecal material, without any evidence of hemorrhage or inflammatory exudates. The tissue reaction was identified as normal reactive follicular hyperplasia. This appendix was from a 21-year-old Muslim woman, from Isfahan.

DISCUSSION

The terminal gravid proglottids of *Taenia* separate

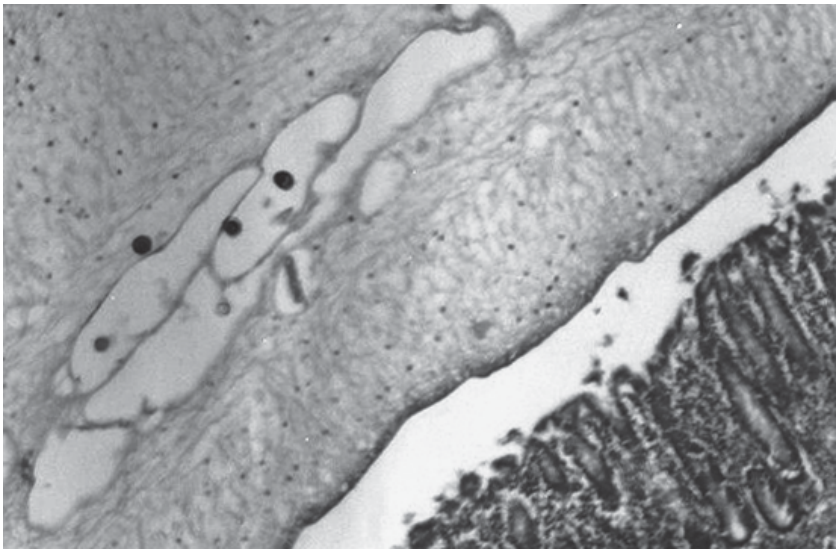

Fig 1- Cross-section of *Taenia* proglottoid and uterus eggs in the lumen of the appendix. H & E staining.

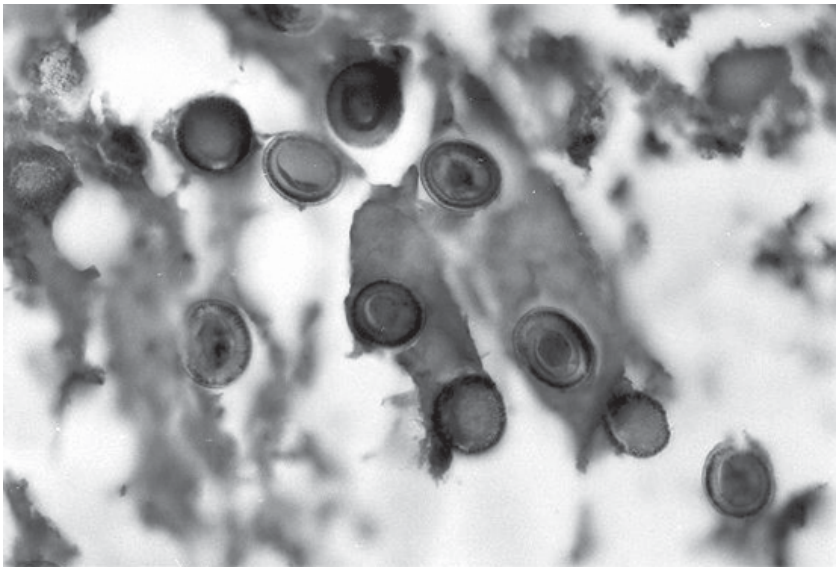

Fig 2- Eggs of *Taenia* in the lumen of appendix. H & E staining.

from the strobila and sporadically can cause acute or sub-acute appendicitis or cholangitis (Pawlowski, 1990). In the literature, about 100 cases of intestinal obstruction, perforation, or appendicitis have been reported (Muller, 2002). How the parasite enters the appendix remains unresolved. Other possible known sites of *Taenia* infection are the liver, lung, brain, and eye (Lejbkowicz, 2002).

In the present study, among 2,379 surgically resected appendices in Isfahan Medical University Teaching Hospital, between 1993-2002, two cases of appendicular taeniasis were found. Both patients were inhabitants of Isfahan where *T.saginata* is endemic. In one case, both eggs and proglottids were present in the lumen of a perforated appendix and the tissue reaction was acute gangrenous appendicitis. The

second case was an appendix with normal reactive follicular hyperplasia, with the lumen of the appendix infested with the eggs of *Taenia*. Although appendicular taeniasis is uncommon, in most cases it is associated with pathological disorders. Lejbkowicz *et al* (2002) reported two cases of *Taenia* infestation of the appendix, which both showed acute phlegmonous inflammation. Jain *et al* (2000) described an unusual association of malakoplakia of the appendix with eggs of *Taenia* species. They observed eggs of *Taenia* species in the wall of the appendix and discussed the implication of helminthic infestation in the pathogenesis of the lesion.

As the eggs of *T. saginata* and *T. solium* are identical, the morphology of eggs alone can not be used to distinguish these two species. Therefore, reviewing the information of patients as much as possible can simplify identification of the organisms in tissue (Garcia, 2001). Both infested appendices reported in the present study belonged to Muslim patients who did not consume pork, but resided in Isfahan, where *T. saginata* is endemic. Moreover, the plurality of uterine branches in the proglottid of the first case is an indication of *T. saginata* segment. The most probably both described appendices in this paper have been infested with *T. saginata*. This species has also been identified as the causative agent in appendicular teaniasis in some other reports (Rousseau *et al*, 1969; Kvasz *et al*, 1987; Lejbkowicz *et al*, 2002). This may be due to activity of gravid proglottids of *T. saginata* in contrast to those of *T. solium* which are excreted passively. Obviously the wider geographical distribution of *T. saginata* is also important in this issue.

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