Esophageal Scab Mimicking a Parasite: A Case Report

Wei-ping Liu
Di Huan
Jin-guang Wang
Qiao-lan Lv
Umar Ibrahim
Xiao-xia Jin
Zhi-yong Tao

Corresponding Author: Zhi-yong Tao, e-mail: Taozhiyong@bbmc.edu.cn

Conflict of interest: None declared

Source of support: This work was supported by grants from the Scientific Research Innovation Team Project of Anhui Colleges and Universities (2016-40) and the Key Program of Natural Science Project of Anhui Higher Education Institutions (KJ2017A222)

Patient: Male, 65-year-old
Final Diagnosis: Esophageal scab
Symptoms: Choking • esophageal foreign body
Medication: —
Clinical Procedure: —
Specialty: Molecular Biology • Gastroenterology and Hepatology • Pathology
Objective: Unknown ethiology
Background: Parasitic helminths in the esophagus are rare. Here, we report a case of esophageal scab mimicking a parasite.
Case Report: A 65-year-old man was admitted to our hospital because after choking on food. Gastroscopy showed 2 foreign bodies adherent to the esophagus wall 28 and 34 cm from the incisor, which appeared to be a fluke. Two fluke-like foreign bodies (1.5 and 1.8 cm in length) were removed from the esophageal ulcer with forceps. After fixation with alcohol, the suspected fluke-like foreign bodies were noted to be brown and woody. Under a light microscope, the structure of the foreign body was not apparent, and no typical flatworm tegument structure was demonstrated on pathologic sections, but it had a blood clot-like structure. Administration of albendazole did not expel any helminths. A stool examination showed no eggs of the putative flukes. The genomic DNA of the suspected flukes was extracted and a 700 bp fragment was amplified by universal barcoding primers. The sequencing showed that the homology with human cytochrome c oxidase subunit I gene was 98.8%.
Conclusions: The scab formed by the esophageal ulcer was identified based on clinical manifestations, anti-helminth and stool examinations, parasite morphology, and molecular biology. Our experience with this case suggests that the universal barcoding technique can be used for identification of foreign bodies suspected to be parasites.

MeSH Keywords: Clinical Laboratory Techniques • DNA Barcoding, Taxonomic • Esophageal Diseases • Parasites

Full-text PDF: https://www.amjcaserep.com/abstract/index/idArt/925199
Background

Parasitic helminths in the esophagus are rare. Several parasites, such as Gongylonema pulchrum, can parasitize under the esophageal mucosa [1,2]. Approximately 10% of American trypanosome infections can affect the esophagus [3]. Other parasites can also abnormally inhabit the esophagus, such as Ascaris, which causes a hiatal hernia, and hookworms in the lower esophagus [4]. Here, we report a case of esophageal scab mimicking a parasite.

Case Report

A 65-year-old man was admitted to the hospital on 12 February 2018 for evaluation of “choking for half a year that has worsened for 3 days”. The patient had pain and discomfort in the upper abdomen, no nausea or vomiting, and administration of domperidone did not significantly improve the symptoms. During the course of the illness, the patient had no dizziness, headaches, fevers, shivering, coughing, expectoration, chest discomfort, sleep disturbances, or recent weight loss.

A chest X-ray showed that the bronchovascular markings were accentuated and blurred, and the aorta was tortuous. A color Doppler ultrasound of the liver, gallbladder, pancreas, and spleen showed a hyperechoic focus in the liver, which were thought to be possible calcifications. An electrocardiogram revealed sinus bradycardia. The carbon urea breath test was positive and a routine urinalysis was positive for urobilinogen. Routine blood and biochemical testing were normal. The hepatitis B core antibody and surface antibody titers were positive. No other abnormalities were recorded.

Gastroscopy showed foreign bodies in the esophagus 28 and 34 cm away from the incisors that appeared to be fluke-like parasites, with esophageal ulcers and erosive gastritis. Two fluke-like foreign bodies, approximately 1.5 and 1.8 cm in length, were extracted and stored in 75% ethanol solution for inspection. The results of laboratory examination showed that the appearance of the foreign body was consistent with a fluke, but the structure of the foreign body was not evident under the microscope, such as atypical tegument and internal organs. Therefore, it was not possible using a morphologic methodology to confirm that the foreign body was a trematode. Thus, the suspected flukes were sent to the Parasitology Department of Bengbu Medical College for further identification.

When the medical history was obtained, the patient related a history of eating roasted grasshoppers. He went on to say that he spit out a living worm-like object, but without consulting a physician. Administration of albendazole did not expel the parasite. A stool examination was negative for the presence of helminths eggs. A repeat gastroscopy showed esophagitis and chronic non-atrophic gastritis. The discomfort had improved. After the evaluation was completed, the patient was discharged from the hospital.

After fixation with alcohol, the suspected flukes were brown and woody, and approximately 1.8 cm in length. Microscopic examination showed that the suspected flukes were not transparent and the internal structure was not visible. After histologic sectioning and hematoxylin and eosin (HE) staining, the internal part was suspected to contain blood components (Figure 1).

To determine the nature of the suspected parasite, biological barcoding technology was used to identify its molecular biology. The suspected parasite body was dissected and DNA was extracted using AxyPrep Multisource Genomic DNA Mini-prep Kit (Corning, Suzhou, China). In view of the woody mature of the suspected parasite under microscopy, the genomic DNA of 1 rose sample was extracted as a plant control.

Figure 1. Morphologic observation of the suspected parasite. (A) One of the foreign bodies was removed by gastroscopy; (B) After fixation with alcohol, the suspected parasite was brown and woody, and approximately 1.8 cm in length; (C) The histologic section shows that there was no tegument characteristic of flatworms on the outer edge of the specimen, and there was blood and inflammatory exudates in the inner part.
The mitochondrial gene COI-based barcoding primers for animals were as follows [5]:

COI_F (5'-GGTCACAACAATCTAAAGATATTGG-3'); and COI_R (5'-TAAACTTCAGGGTGACCAAAAAATCA-3').

The amplification parameters were as follows: initial denaturation at 95°C for 5 min; 35 cycles at 95°C for 15 s; 45°C for 30 s and 72°C for 45 s; followed by a final elongation at 72°C for 5 min. The rbcl gene-based barcoding primers for detecting plants were as follows [6]:

rbcla_F (5'-ATGTCACCACAAACAGAGACTAAAGC-3'); and rbcla_R (5'-GAAACGGTCTCTCCAACGCAT-3').

PCR amplification parameters were as follows: initial denaturation at 98°C for 4 min; 5 cycles at 94°C for 30 s; 55°C for 60 s and 72°C for 60 s; 30 cycles at 94°C for 10 s; 54°C for 15 s; 72°C for 45 s; followed by a final elongation at 72°C for 5 min. The Taq enzyme and other reagents used in PCR amplification were purchased from Sangon Biotech Co. (Shanghai, China). The amplified PCR products were analyzed by 1% agarose gel electrophoresis. The results showed that a single band of 710 bp was amplified from foreign body DNA samples using universal primers for animals, but not for plants (Figure 2). The PCR product was further sequenced by Sangon Biotech Co., and were highly consistent with human cytochrome c oxidase subunit I (COI) by NCBI BlastN comparison. Based on the gross appearance, microscopic examination, pathologic sections, and molecular biologic examination, the suspected parasite was determined to be a scab caused by esophageal injury.

Discussion

The anatomical characteristics of the esophagus and its function make it difficult for parasites to attach, and any parasite present in that location would be easily dislodged by food, and it would be difficult to obtain nutrients such as partly digested food. Wen et al. [7] reported 614 cases of parasite infections detected by endoscopy of the digestive tract in 15 years, among which 370 were found by endoscopy in the upper digestive tract, but no parasite infection was found in the esophagus. In the present case, gastroscopy showed that the 2 “parasites” were attached side-by-side in the upper part of the esophagus. The appearance of the foreign bodies removed with forceps were leaf-shaped, which ruled out a nematode infection. In the process of removing the “worms” using endoscopic forceps, esophageal scabs moved during the biopsy or with esophageal movement, which may have caused the illusion of “activity” of the “worms.” In addition, the patient had a history of eating roasted grasshoppers, and mentioned he had spit out living worms, which led to the suspected diagnosis of parasitic worms. The formation of eschar is due to hemorrhage and agglutination of the blood on the surface of the body to form a solid hard eschar, while the internal organs generally do not form eschar. The formation of scabs in this patient may be related to the esophageal damage caused by eating hard food.

In this case, the nature of the suspected flatworm was identified by various laboratory methods and a parasitic infection was excluded. DNA barcode technology uses relatively short but stable gene sequences to identify biological species by comparison. The COI gene has less deletions and insertions, which is conducive to designing universal primers and is the preferred target of DNA barcoding, with important applications in the identification and classification of unknown species [8,9].

Conclusions

In this case, we used universal barcode primers to identify the nature of esophageal foreign bodies from animal and plant species. This method is of great value for the identification of gastrointestinal foreign bodies, especially those suspected to be parasites.

Acknowledgements

The authors thank Professor Liu De-cun of Bengbu Medical College for helpful discussion on the pathology section.

Conflict of interests

None.
References:

1. Huang Q, Wang J, Yang T, Liu Y: Multiple Gongylonema pulchrum worms in a human esophagus. Endoscopy, 2016;48 (Suppl 1. UCTN): E24–25
2. Yan XL: [One case of Gongylonema pulchrum infection in esophagus in human.] Zhongguo Xue Xi Chong Bing Fang Zhi Za Zhi, 2016; 29(1):126–28 [in Chinese]
3. Lages-Silva E, Crema E, Ramirez LE et al: Relationship between Trypanosoma cruzi and human chagasic megaesophagus: Blood and tissue parasitism. Am J Trop Med Hyg, 2001; 65(5): 435–41
4. Zheng PP, Wang BY, Wang F et al: Esophageal space-occupying lesion caused by Ascaris lumbricoides. World J Gastroenterol, 2012; 18(13): 1552–54
5. Folmer O, Black M, Hoeh W et al: DNA primers for amplification of mitochondrial cytochrome c oxidase subunit I from diverse metazoan invertebrates. Mol Mar Biol Biotechnol, 1994; 3(5): 294–99
6. Amandita FY, Rembold K, Vornam B et al: DNA barcoding of flowering plants in Sumatra, Indonesia. Ecol Evol, 2019; 9(4): 1858–68
7. Wen CH, Zeng ZC, Liu J et al: [Analysis of 614 cases of parasite infection diagnosed and treated by gastrointestinal endoscope.] China Journal of Endoscopy, 2019;25[12]: 71–75. [Article in Chinese]
8. Hebert PD, Penton EH, Burns JM et al: Ten species in one: DNA barcoding reveals cryptic species in the neotropical skipper butterfly Astrypes fulgerator. Proc Natl Acad Sci USA, 2004; 101(14): 14812–17
9. Laurito M, Ontivero IM, Almirón WR: Increasing the digital repository of DNA barcoding sequences of sand flies (Psychodidae: Phlebotominae). Mem Inst Oswaldo Cruz, 2019; 114: e190208