



Contents lists available at ScienceDirect

Asian Pacific Journal of Tropical Disease

journal homepage: www.elsevier.com/locate/apjtd



Document heading

doi:

© 2013 by the Asian Pacific Journal of Tropical Disease. All rights reserved.

Hydatidosis as a cause of acute appendicitis: a case report

Maryam Hajizadeh¹, Ehsan Ahmadpour^{2,4}, Amir Taher Eftekhar Sadat³, Adel Spotin^{4,5*}¹Tabriz University of Medical Sciences, Research Center of Infectious and Tropical Diseases, Iran²Department of Parasitology and Mycology, Sari Medical School, Mazandaran University of Medical Sciences, Sari, Iran³Department of Pathology, Tabriz University of Medical Sciences, Tabriz, Iran⁴Department of Parasitology and Mycology, Tabriz University of Medical Sciences, Tabriz, Iran⁵*Department of Parasitology and Mycology, Shahid Beheshti University of Medical Sciences, Tehran, Iran

PEER REVIEW

ABSTRACT

Peer reviewer

Soheila Rouhani, Associated Prof, Department of Parasitology and Mycology, Shahid Beheshti University of Medical Sciences, Tehran, Iran.
Tel: +9821- +98-21-22439962
E-mail: srouhani11@yahoo.com

Comments

This is a good study in which the authors evaluated acute appendicitis of hydatidosis origin is not seen frequently even in the hyper endemic area although. Therefore, described an unusual cases of hydatidosis, should be considered in the differential diagnoses of appendicitis.

(Details on Page 73)

Acute appendicitis is considered the most common cause of emergency surgery in children and young adults. The association between parasitic infections and appendicitis has been widely investigated. Hydatidosis, a zoonotic helminthic disease caused by the larval stage of the *Echinococcus granulosus*, may cause illness in intermediate hosts, generally human and herbivorous animals. This disease is considered hyper endemic in northwest of Iran and is a serious public health problem. Hydatidosis predominantly is located in internal organs especially liver and lung but is considered a rare cause of acute appendicitis. Our aim was to study hydatid cyst that causes appendicitis. In this retrospective descriptive, 275 appendectomies performed during the years 2007–2012 in Tabriz Emam Reza hospital. Depending on the clinical notes, serological method, laboratory, surgical findings and attention to the histopathologic results, we found a patient with appendiceal hydatidosis. Acute appendicitis of hydatidosis origin is not seen frequently even in the hyper endemic area. Therefore, described an unusual cases of hydatidosis, should be considered in the differential diagnoses of appendicitis also education on how to prevent hydatidosis and eradication of stray dogs should be included in training programs to avoid and decrease the appendectomy operations.

KEY WORDS

Hydatidosis, Appendicitis, *Echinococcus granulosus*, Appendectomy

1. Introduction

Hydatidosis (Cystic echinococcosis) is cyclozoönosis disease that caused by tapeworm *Echinococcus* spp. This disease is one of the most important zoonotic diseases. Northwest of Iran (Tabriz, Ardebil and Urmia provinces) is considered as hyper endemic region^[1]. Hydatid cyst usually locate in liver, lung but several studies have been reported from ectopic sites such as appendix, spleen, spinal, orbit, ovary, parotid glands, pancreas, skin,

lymphatic glands, uterus and tonsil except nails, teeth and hair^[2]. The important risk factors in life cycle of *Echinococcus granulosus* (*E. granulosus*) include contact with dog and sheep, eating vegetable and carrot juice mixture ice cream as potential source in Iran, geophagy, breast pumping and Tileh bazi (a local game in Iran^[2]). In Iran rate of human infection is 0.6–1.2/100 000 and incidence of hydatidosis is almost 1% of permission to surgical wards^[3–5]. In Iranian stray dogs prevalence of contamination with *E. granulosus* shows 5% to 49%^[6–8]. In

*Corresponding author: Adel Spotin, Department of Parasitology and Mycology, Shahid Beheshti University of Medical Sciences, Tehran, Iran

Tel: +98-21-22439962

E-mail: adelespotin@gmail.com

Foundation Project: Supported by Tabriz University of Medical Sciences (grant No. 12/2123-2011).

Received 5 Nov 2012

Received in revised form 8 Nov, 2nd revised form 13 Nov, 3rd revised form 17 Nov 2012

Accepted 28 Dec 2012

Available online 28 Feb 2013

this study we present a 58-year-old man, that complaint with anorexia, low-grade fever and faint abdominal pain, who underwent appendectomy and the pathology showed hydatid cyst. This is the first report from hydatid cyst of appendix in northwest of Iran in English language literature.

2. Case history

During the years 2007–2012 in Tabriz Emam Reza hospital, we diagnosed a 58-year-old man with appendiceal hydatidosis. This patient presented with anorexia, fatigue, low-grade fever, pruritus and faint abdominal pain. Base on physical examination, masses in different areas of abdomen were palpated. Laboratory investigations showed a mild eosinophilia ($1\,500/\text{mm}^3$ to $5\,000/\text{mm}^3$) with normal hemoglobin (15 Unit-g/L). Serological method of Indirect hemagglutination assay (IHA) for hydatidosis was positive (IHA of 1:64 and normal of 1:32). In appendicitis sections, germinal layer observed for yellowish with less diameter than laminate layer. The pathological investigations revealed the lumen include brood capsules containing multiple protoscoleces (H&E, $\times 400$) accompanied by necrosis and infiltration of inflammatory cells predominantly eosinophils. In cross section of an *E. granulosus* cyst laminate and germinal layers, brood capsul, calcareous corpuscles, hooklets are considered as diagnostic keys (Figure 1). After one year of operation and treatment (100 mg of mebendazole a oral dose) patient was free of symptoms. Three months after surgery, indirect hemagglutination assay was negative.

Hydatidosis is a zoonotic disease that caused by the larval stage of the tapeworm *Echinococcus* spp, which is highly prevalent in the Mediterranean area, East Europe, South America, Australia, Middle East, and specifically in northwest of Iran^[1]. The liver and lung are most common affected organs, as a hydatid cyst can as long as live 53 years in the host body^[7]. This study is first report from hydatid cyst of appendix in northwest of Iran although only however one case have been reported from Southwest of Iran (Shiraz city)^[8]. More reports of parasitic appendicitis are related to *Enterobius vermicularis*, *Taenia proglottid*, *Ascaris lumbricoides* and *Trichuris trichiura* but primary appendiceal hydatid cyst is highly rare^[9,10]. The grade of parasitosis in appendectomy varies between 0.46% to 40% in the literatures^[11,12]. Acute appendicitis occurs approximately 7% of the population while the accepted incidence of chronic appendicitis is 1% of all cases of appendicitis^[13,14]. It is the emergency surgery caused mainly by the destruction and obstruction of the appendix lumen. In histopathological sections we used important diagnostic keys. These were hammer shape hooklets inside of protoscoleces, white laminate layer (acellular), yellowish germinal layer (nucleated),

calcareous corpuscles (as center of worm metabolism) and hydatid sands (Figure 1A, 1C and 1D). The appendix lumen can be permeated by parasites, fecal material and pus cells but they may not necessarily result in symptoms however cause inflammation of the appendix lumen (Figure 1B). In our study, all of appendiceal hydatidosis patients did not have any hydatidosis surgery formerly, so this question arises that which factors are involved in ectopic migration of hydatid cyst. Some studies have been reported that general anesthesia, constipation, fever and spicy seasoning are involved in migration of helminthes in unusual sites^[14,15]. Acute appendicitis of hydatidosis origin is not seen frequently even in the hyper endemic area. Therefore, described an unusual cases of hydatidosis, should be considered in the differential diagnoses of appendicitis. To prevent parasitic infestations, hygiene standards of public health need to be raised, also eradication of stray dogs and follow up of patients should be included in training programs to avoid and decrease the appendectomy operations.

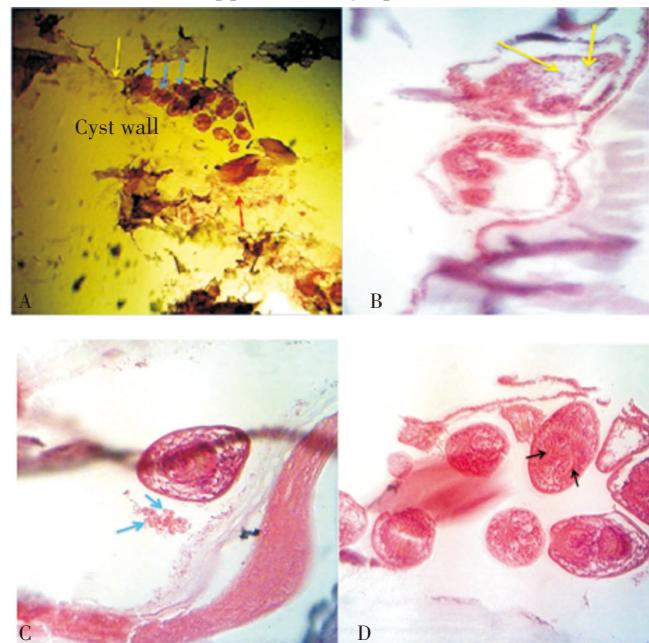


Figure 1. Pathological investigations of *E. granulosus* cyst (H&E stain). A: The cyst wall is composed of a thick laminated outer layer (red arrow) and a thin, germinal inner layer (yellow arrow). Brood capsule (black arrow) with protoscoleces (blue arrow), ($\times 100$); B: Inflammatory cells especially eosinophils inside one of protoscoleces ($\times 400$); C: Calcareous corpuscles (blue arrows) along the germinal layer ($\times 400$); D: Hooklets (black arrow) inside one of the protoscoleces ($\times 400$).

Conflict of interest statement

We declare that we have no conflict of interest.

Acknowledgements

We would like to thank from staff of Tabriz Emam Reza

hospital for their collaboration and the patient for allowing us to report his case report. This research by No12/2123 (2011) was financially supported by Tabriz University of Medical Sciences, Research Center of Infectious and Tropical Diseases and Department of Parasitology and Mycology, Tabriz University of Medical Sciences, Tabriz, Iran.

Comments

Background

Acute appendicitis is considered the most common cause of emergency surgery in children and young adults. The association between parasitic infections and appendicitis has been widely investigated. Hydatidosis, a zoonotic helminthic disease caused by the larval stage of the *Echinococcus granulosus*, may cause illness in intermediate hosts, generally human and herbivorous animals. This disease is considered hyper endemic in northwest of Iran and is a serious public health problem. Hydatidosis predominantly is located in internal organs especially liver and lung but is considered a rare cause of acute appendicitis. Our aim was to study hydatid cyst that causes appendicitis. In this retrospective descriptive, 275 appendectomies performed during the years 2007–2012 in Tabriz Emam Reza hospital. Depending on the clinical notes, serological method, laboratory, surgical findings and attention to the histopathologic results, we found a patient with appendiceal hydatidosis. Acute appendicitis of hydatidosis origin is not seen frequently even in the hyper endemic area. Therefore, described an unusual cases of hydatidosis, should be considered in the differential diagnoses of appendicitis also education on how to prevent hydatidosis and eradication of stray dogs should be included in training programs to avoid and decrease the appendectomy operations.

Related reports

Bolanparvaz et al in 2010s survey appendiceal hydatid cyst in Southwest of Iran (Shiraz city), Kabukcuoglu S in 2000s and Hawes AS in 1994s demonstrated that acute appendicitis occurs approximately 7% of the population while the accepted incidence of chronic appendicitis is 1% of all cases of appendicitis.

Innovations & breakthroughs

This is the first report from hydatid cyst of appendix in northwest of Iran in English language literature. It showed that prevention of parasitic infestations and hygiene, standards of public health need to be raised, also eradication of stray dogs and follow up of patients should be included in training programs to avoid and decrease the appendectomy operations. Considering hydatidosis as acute appendicitis in endemic and hyper endemic areas

Differential of acute appendiceal originated from other helminthic disease.

Peer review

This is a good study in which the authors evaluated acute appendicitis of hydatidosis origin is not seen frequently even in the hyper endemic area although. Therefore, described an unusual cases of hydatidosis, should be considered in the differential diagnoses of appendicitis.

References

- [1] Sadjjadi SM. Present situation of echinococcosis in the Middle East and Arabic North Africa. *Parasitol Int* 2006; **55**: 197–202.
- [2] Rokni MB. Echinococcosis/hydatidosis in Iran. *Iranian J Parasitol* 2009; **4**(2): 1–16.
- [3] Lotfi M. Diagnosis and treatment of hydatid cyst of the liver: twenty years experience in Iran. *Pakistan J Surgery* 1992; **8**: 109–114.
- [4] Hadighi R, Mirhadi F, Rokni M. Evaluation of a dot-ELISA for the serodiagnosis of human hydatid disease. *Pak J Med Sci* 2003; **19**: 268–271.
- [5] Dalimi A, Motamedi G, Hosseini M, Mohammadian B, Malaki H, Ghamsari Z, et al. Echinococcosis/hydatidosis in western Iran. *Vet Parasitol* 2002; **105**: 161–171.
- [6] Fallah M, Taherkhani H, Sadjjadi M. Echinococcosis in stray dogs in Hamedan, west of Iran. *Iranian J Med Sci* 1995; **29**: 170–172.
- [7] Spruance SL. Latent period of 53 years in a case of hydatid cyst disease. *Arch Intern Med* 1974; **134**: 741–742.
- [8] Bolandparvaz Sh, Baezzat SR, Geramizadeh B, Salahi R, Lotfi M, Paydar Sh. Appendiceal hydatid cyst: a case report and review of literature. *Clin J Gastroenterol* 2010; **3**: 182–185.
- [9] Francis B. *Echinococcus* cyst of appendix. *J Am Med Assoc* 1926; **87**: 1037.
- [10] Agarwala N, Liu CY. Laparoscopic appendectomy. *J Am Assoc Gynecol Laparosc* 2003; **10**: 166–168.
- [11] Ariyarathenam AV, Nachimuthu S, Tang TY, Courtney ED, Harris SA, Harris AM. *Enterobius vermicularis* infestation of the appendix and management at the time of laparoscopic appendectomy: case series and literature review. *Int J Surg* 2010; **8**(6): 466–469.
- [12] Egilmez R, Saygi G, Aker H, Elagöz S. Retrospective analysis of appendix vermiciformis specimens for intestinal helminths. *Turkey Ekopatologi Dergisi* 2000; **6**: 1–4.
- [13] Kabukeuoglu S, Dogan N, Bildirici K, Tel N. The incidence and distribution of parasited appendicitis cases in Eskisehir. *Acta Parasitol Turcica* 2000; **24**: 255–258.
- [14] Hawes AS, Whalen GF. Recurrent and chronic appendicitis: the other inflammatory conditions of the appendix. *Am Surg* 1994; **60**(3): 217–219.
- [15] Mattei P, Sola JE, Yeo CJ. Chronic and recurrent appendicitis are uncommon entities often misdiagnosed. *J Am Coll Surg* 1994; **178**: 385–389.