Acute Appendicitis Secondary to Enterobius Vermicularis Infestation: A Case Report

Abdellillah El Bakouri, Amal Hajri, Abdelhak Ettaoussi, Mounir Bouali, Fatimazahra Bensardi, Khalid El Hattabi, and Abdelaziz Fadil

Abstract—The association of *Enterobius vermicularis* and appendicitis were recognized in the late XIXe century, when an incidence of 19% of appendicular infestation in children with appendicitis was reported. Other studies showed that the relationship between this parasitosis and appendicitis varied from 0.2 to 41.8 worldwide. In this paper we present an adult patient with acute appendicitis caused by *Enterobius Vermicularis* discovered in per-surgical procedure, and we're going to discuss on the bases of the literature the epidemiological, clinical, and therapeutic characteristics of the appendicular localization of oxyurosis.

Index Terms—Albendazole; appendicitis; *Enterobius vermicularis*; surgery.

I. INTRODUCTION

Enterobius vermicularis is an important and often unexpected finding in appendectomy specimen, most commonly seen in pediatric cases [1, 2]. The role of this pinworm in the etiology of appendicitis is controversial. However the most widely reported phenomenon is one of appendicular colic due to the presence of a worm in the appendicular lumen [3, 4]. We report a case of acute appendicitis secondary to *enterobius vermicularis* infestation.

Case report

He is a 39 year old men; chronic smoking at 20 PA. Admitted to surgical emergency for right iliac fossa pain evolving 2 days before admission, associated with vomiting, all evolving in a context of feverish sensation.

Admission clinical examination found a patient who was hemodynamically and breathing conscious, stable. On the abdominal examination a sensitivity of the right iliac fossa and the rectal touch was without particularity. The NFS had objective a leukocytosis at 12000 element / mm³. An abdominal ultrasound revealed an aspect of uncomplicated acute appendicitis measuring 10 mm in diameter.

The procedure consisted of a retrograde appendectomy. With exploration an inflamed appendix retro-coecale with healthy base with presence of white worms on the trench of appendicular section (figure: 1) evoking a priori an appendix pinworm. The postoperative continuations was simple and the patient was declared outgoing on the first day post-operative under anti-helminthic oral therapy. The decline was 2 months.

Fig 1: Intraoperative image showing the presence of white worms during the section of the appendix in favor of pinworm.

II. DISCUSSION

The reported incidence of *E. vermicularis* appendicitis varies widely from 0.2 to 41.8%, and young girls are mostly affected [5, 6]. It remains unclear why females show a predominance in cases of appendicitis caused by *E. vermicularis*, ranging from 74% to 76% [7, 8].

The most common manifestation of *E. vermicularis* is perianal pruritus that results from the migration of the female pinworm to lay its eggs in the perianal area [9]. However, it has also been noted to present as a mesenteric abscess, urinary tract infections, salpingitis, and appendicitis [10, 11]. Before improved sanitary conditions, in 1899 Still reported that 19% of acute appendicitis occurred in conjunction with *E. vermicularis* infestation [12].

The relationship between *E. vermicularis* and pathogenesis of appendicitis had been studied for many years, the influence of the parasite to induce inflammation is still unclear. Although *E. vermicularis* (pinworm) may have a role in causing appendiceal discomfort or appendicular chronic inflammation due to obstruction, the majority of cases have no acute inflammation [13].

Enterobius infestation can cause diseases like acute appendicitis, chronic appendicitis and ruptured appendicitis is shared by others [14], and even more morbid complications like gangrenous appendicitis and perforation resulting in peritonitis [15]. None the less, there have been reports of completely asymptomatic patients [14].

The pathophysiology behind the association between *E. vermicularis* and clinically suspected appendicitis is similar to that associated with a faecolith or luminal lymphoid hyperplasia of the appendix [16] (figure 2). By obstructing the appendicular canal it produces colicky right iliac fossa (RIF) pain “appendicular colic” but unusually leads to appendicular inflammation [16, 17]. It can therefore lead to a clinical scenario mimicking acute appendicitis but not necessarily cause it. This is important when deciding on the management approach to patients with RIF pain and suspected *E. vermicularis* as it is a treatable infection with common anti-helminthic oral therapy (recommendation for mebendazole) [18].

Fig. 2: a. The histological view showing the inflamed appendicular wall, with parasites in the lumen (black arrows). A hyperplastic lymphoid follicle is also seen in the mucosa and submucosa (hematoxylin–eosin-saffron $\times 100$). b. Another section of the appendix showing histological signs of intense acute inflammation: epithelial ulceration and suppurative necrosis (hematoxylin–eosin-saffron $\times 100$) [19].

We identified that one can clinically differentiate true appendicitis from appendiceal colic caused by *E. vermicularis* luminal obstruction in a pediatric patient who presents with RIF pain (namely Eosinophilia, normal WCC and normal Neutrophil count at presentation). In appendicular oxyurosis, several tissue changes can affect the appendix from lymphoid hyperplasia, granulomatous inflammation, phlegmonous inflammation, to perforation.

E. vermicularis are most often endoluminal (90% of the cases), rarely intraparietal, because they can penetrate the mucous membrane only if it is damaged. The coexistence of other parasites with *E. vermicularis* is possible, but remains very rare.

When diagnosed intraoperatively, *E. vermicularis* should be treated based upon several principles. If any pinworms are appreciated, they should be controlled with thermal ablation or endoscopic suctioning [20]. A specimen bag should be implemented for removal of the appendix [20]. After removal of the appendix, the port sites, abdominal cavity, and pelvis should be meticulously examined for any spillage before closing [20]. These steps should be taken to protect against potential intraperitoneal contamination, which can be complicated by omentitis, pelvic inflammatory disease, and pelvic peritoneal granulomas [20]. Concurrent with surgical treatment, patients should be treated with a dose of mebendazole, pyrantel pamoate, or albendazole at the time of diagnosis, and another dose 2 weeks after treatment [21]. Household contacts do not need to be treated for *E. vermicularis* unless more than one household member is affected or if the infection recurs [21].

III. CONCLUSION

Enterobius Vermicularis is a colonic parasitosis. The infection often remains asymptomatic and of incidental

discovery that has histological examination of the operating room. Also, before digestive disorders suggestive of appendicitis, apart from surgical emergencies, a complete parasitic examination with repeated scotch tests is recommended. The positivity of these examinations would reduce the number of unnecessary appendectomies. In this case, a simple antiparasitic treatment is indicated.

REFERENCES

- [1] M. Yilmaz, S. Akbulut, K. Kutluturk, N. Sahin, E. Arabaci, C. Ara, S. Yilmaz, Unusual histopathological findings in appendectomy specimens from patients with suspected acute appendicitis, *World J. Gastroenterol.* 19 (25) (2013) 4015e4022.
- [2] S. Akbulut, M. Tas, N. Sogutcu, Z. Arikanoğlu, M. Basbug, A. Ulku, H. Semur, Y. Yagmur, Unusual histopathological findings in appendectomy specimens: a retrospective analysis and literature review, *World J. Gastroenterol.* 17 (15) (2011) 1961e1970.
- [3] M.A. Ramezani, M.R. Dehghani, Relationship between *Enterobius vermicularis* and the incidence of acute appendicitis, *Southeast Asian J. Trop. Med. Public Health* 38 (1) (2007) 20e23.
- [4] D.F. da Silva, R.J. da Silva, M.G. da Silva, A.C. Sartorelli, M.A. Rodrigues, Parasitic infection of the appendix as a cause of acute appendicitis, *Parasitol. Res.* 102 (1) (2007) 99e102.
- [5] Ariyathenam 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):466–9.
- [6] Ahmed MU, Bilal M, Anis K, Khan AM, Fatima K, Ahmed I, et al. The frequency of *Enterobius vermicularis* infections in patients diagnosed with acute appendicitis in Pakistan. *Glob J Health Sci.* 2015; 7(5):196–201.
- [7] Ahmed MU, Bilal M, Anis K, et al. The frequency of *Enterobius vermicularis* infections in patients diagnosed with acute appendicitis in Pakistan. *Global J Health Sci* 2015; 7:196–201.
- [8] Lala S, Upadhyay V. *Enterobius vermicularis* and its role in paediatric appendicitis: Protection or predisposition? *E. vermicularis* in appendicitis. *ANZ J Surg* 2016; 86:717– 719.
- [9] Dunphy L, Clark Z, Raja MH. *Enterobius vermicularis* (pinworm) infestation in a child presenting with symptoms of acute appendicitis: A wriggly tale! *BMJ Case Rep* 2017, pii.
- [10] Sodergren MH, Jethwa P, Wilkinson S, Kerwat R. Presenting features of *Enterobius vermicularis* in the vermiform appendix. *Scand J Gastroenterol* 2009; 44:457–461.
- [11] Akkapulu N, Abdullazade S. Is *Enterobius vermicularis* infestation associated with acute appendicitis? *Eur J Trauma Emerg Surg* 2016; 42:465–470.
- [12] Arca M, Gates R, Groner J, Hammond S, Caniano D. Clinical manifestations of appendiceal pinworms in children: An institutional experience and a review of the literature. *Pediatr Surg Int* 2004;20:372–375.
- [13] Gialamas E, Papavramidis T, Michalopoulos N, Karayannopoulou G, Cheva A, Vasilaki O, et al. *Enterobius vermicularis*: a rare cause of appendicitis. *Türkiye parazitolojii dergisi.* 2012; 36(1):37.
- [14] Fallah E, Dehghani A. A Study On *Enterobius Vermicularis* Infection In A Appendices Removed By Surgery In Tabriz Hospitals.11th International Congress of Parasitology. 2008; 4(1):1–5.
- [15] Madhukar KP, Verma R, Sayed Z, Vira L. Acute appendicitis secondary to *enterobius vermicularis* infestation in a young female: a case report. *Journal of evolution of medical and dental sciences.* 2014; 3(19):5219-23.
- [16] O.G. Ajao, S. Jastaniah, T.S. Malatani, N. Morad, E.N. el Tayeb, et al., *Enterobius vermicularis* (pinworm) causing symptoms of appendicitis, *Trop. Dr.* 27 (1997) 182e183.
- [17] M.J. Arca, R.I. Gates, J.I. Groner, S. Hammond, D.A. Caniano, Clinical manifestations of appendiceal pinworms in children: an institutional experience and a review of literature, *Paediatr. Surg. Int.* 20 (2004) 372e375.
- [18] A.C. Nackley, J.J. Nackley, T.R. Yeko, S. Gunasekaran, Appendiceal *enterobius vermicularis* infestation associated with right-sided chronic pelvic pain, *J. Soc. Laparoendosc. Surg.* 8 (2) (2004) 171e173.
- [19] B.Efared, G. Atsame-Ebang, B. Marou Soumana, L. Tahiri, N. Hammam, H.El Fatemi , L. Chbani. Acute suppurative appendicitis associated with *Enterobius vermicularis*: an incidental finding or a causative agent? A case report. *BMC Res Notes* (2017)10:494.

- [20] Kaczynski J, Hilton J. An “appendiceal colic” caused by the *Enterobius vermicularis*. Case Rep 2014; 2013–2014.
- [21] Center for Disease Control and Prevention. Parasites Enterobiasis (also known as pinworm infection) Treatment. 2016. <https://www.cdc.gov/parasites/pinworm/treatment.html> (last accessed July 1, 2018).

Conflicts of interest: None to declare.

Author contributions: All authors have contributed to the conduct of this work. All authors also declare that they have read and approved the final version of the manuscript.

Abdelillah EL BAKOURI

e-mail: A.elbakouri@gmail.com
Hassan 2 University of Casablanca, Morocco
Institution: Department of Visceral Surgical Emergency (P35),
Ibn Rochd University Hospital, Casablanca, Morocco.

Amal HAJRI

Casablanca, Morocco 20400
Telephone: 00212613299259
e-mail: amalhajri.282@gmail.com
Institution: Department of General Surgery III, Ibn Rochd University
Hospital, Casablanca, Morocco.

Abdelhak ETTAOUSI

e-mail: ettaoussi.abdelhak@gmail.com
Hassan 2 University of Casablanca, Morocco
Institution: Department of Visceral Surgical Emergency (P35),
Ibn Rochd University Hospital, Casablanca, Morocco.

Mounir BOUALI

e-mail: boualimounir@hotmail.com
Hassan 2 University of Casablanca, Morocco
Institution: Department of Visceral Surgical Emergency (P35),
Ibn Rochd University Hospital, Casablanca, Morocco.

Fatimazahra BENSARDI

e-mail: fatisardi@yahoo.fr
Hassan 2 University of Casablanca, Morocco
Institution: Department of Visceral Surgical Emergency (P35),
Ibn Rochd University Hospital, Casablanca, Morocco.

Khalid EL HATTABI

e-mail: elhattabi.khalid@yahoo.fr
Hassan 2 University of Casablanca, Morocco
Institution: Department of Visceral Surgical Emergency (P35),
Ibn Rochd University Hospital, Casablanca, Morocco.

Abdelaziz FADIL

e-mail: fadilaziz@yahoo.fr
Hassan 2 University of Casablanca, Morocco
Institution: Department of Visceral Surgical Emergency (P35),
Ibn Rochd University Hospital, Casablanca, Morocco.