Acute suppurative appendicitis with *Blastocystis hominis*

Poppy M Lintong¹, Maria Kr Sambuaga¹, Eddy H Tambajong²

¹ Department of Anatomical Pathology, Universitas Sam Ratulangi Faculty of Medicine, Manado, North Sulawesi, Indonesia
² Kanaka Clinical Laboratory, Manado, North Sulawesi, Indonesia

ARTICLE INFO

Article history:
Received 15 September 2012
Received in revised form 27 September 2012
Accepted 11 November 2012
Available online 28 December 2012

Keywords:
*Blastocystis hominis*
Acute suppurative appendicitis

ABSTRACT

*Blastocystis hominis* (*B. hominis*) is an anaerobic protozoan parasite, which lives in human and animal’s intestines. It is commonly found in the tropical area. The parasite is low pathogen and its infection causes gastrointestinal disease with diarrhea symptom as reported from many studies. *B. hominis* is rarely seen in tissue section. The clinical diagnoses are usually confirmed with the microscopic examination of the stool, which can directly detect the parasite through trichrom stain and Kinyoun acid fast technique. We reported a case of 52 years old man with abdominal pain and suspected as perforated appendicitis and tumor of appendix as the differential diagnosis. The macroscopic features of the appendix mass were 7 cm in length and 1.5–2.5 cm in diameter. The cut section showed a widening of the appendix lumen, and the distal part filled with a gelatinous mass. The microscopic examination with HE stain showed the infiltration of PMN inflammatory cells in the muscle layer of the appendix and foci of a number of round structures in the sub mucosal layer known as *B. hominis*. Some authors reported results from the endoscopy and biopsy examinations that *B. hominis* does not infiltrate in the intestinal mucosa; nevertheless, in this case we found the infiltration of the parasite towards the mucosal and sub mucosal layers of the appendix.

1. Introduction

*Blastocystis hominis* (*B. hominis*) is an anaerobic protozoan parasite that causes blastocystosis (*Zierdt–Garavelli Disease*) in human. *B. hominis* was firstly reported by Alexeieff in 1911, followed by Brumpt in 1912. The parasite not only inhabits in human but also in several animals such as monkeys, apes, pigs, and maybe hamssters, reptiles, cockroaches, rats and other animals. *Vacuolated-form of B. hominis* has been proven to be found in home rats’ feces. On the other hand, the parasite is rarely found in both dogs and cats.

*B. hominis* is predominantly found in the tropical area. The parasite is mostly found within soldiers who come home from battle fields or among travelers. In a routine examination performed to 932 immigrants in Taiwan, the pathogenesis of *B. hominis* remains uncertain. There is a controversy whether the parasite is commensal or pathogen. Some textbooks describe that *B. hominis* is a low pathogen–protozoa and only induces intestinal disease within great amount. Some expertise show that there is a negative correlation between the subsistence of *B. hominis* with diarrhea symptoms, which have been reported to increase, especially for patients with immunocompromise disease, travelers or tourists, homosexuals, and the abandoned children. As a protozoan agent, *B. hominis* plays role and has pathogenic potency to provoke diarrheal disease, especially for patients with immunocompromise disease, travelers or tourists, homosexuals, and the abandoned children. As a protozoan agent, *B. hominis* plays role and has pathogenic potency to provoke diarrheal disease, especially for patients with immunocompromise disease, travelers or tourists, homosexuals, and the abandoned children.
symptoms according to a study conducted in Baghdad, which concludes that B. hominis is a pathogen within patients with symptomatically diarrheal syndromes[10]. As a human parasite, B. hominis causes abdominal disturbances, manifested as anorexia, diarrhea and flatulence[11].

Biopsies from those who are infected by the parasite mostly show normal appearances in the intestinal mucosa. The abnormal appearances only demonstrate the infiltration of mild and unspecific inflammatory cells. Hardly ever, the parasite provokes mucosal destruction; as well, the parasite generally does not penetrate or invade the tissues[1,8]. Moreover, through endoscopic procedure, the intestinal mucosa can be seen normally[1]. B. hominis can also be diagnosed by cytological examination from intestinal flushing matter[1].

B. hominis infection is also associated with ulcerative colitis, terminal ileitis and enteritis that can be cured by metronidazole[1]. What is more, B. hominis infection has been reported to be found in a four year child who showed diarrheal symptom with fever and bloody feces. Through colonoscopy, the patient’s colon demonstrated superficial ulcer with pseudo-membrane throughout the colon; also, diarrheal symptom with fever and bloody feces. Through feces-flushing matter of the patients processed by trichrom staining, B. hominis was found. According to the histological examination from the biopsy tissue of the patient, inflammatory cells within the mucosa of the large-intestine were found. Also, within the ulcer of the same patient, spherical or oval forms of B. hominis with central granulated vacuole and single nucleolus were found along with the infiltration of inflammatory cells[2].

More than 34.7% of B. hominis may be present within individuals who are clinically asymptomatic. On the other hand, those who show symptomatic signs are mostly marked by abdominal pain, watery diarrhea, constipation, anorexia, nausea, flatulence, and weight losses; such symptoms and signs may demonstrate more than two weeks[1,2]. Some authors have reported that B. hominis is one of the diarrheal-causal agents[12]. B. hominis infection has also reported within patients with irritable bowel syndrome (IBS) [13]. Likewise, the same circumstance has also been found in the patients with inflammatory bowel disease (IBD), and chronic diarrheas[14].

Furthermore, B. hominis has also been described as an opportunistic pathogen, found among immunosuppressive and immunocompromise patients. Clinical symptoms are associated with both the severity of the infection and the virulence of B. hominis strains[12].

Conventionally, diagnosis of B. hominis is established through direct examination beneath microscope from the feces-flushing matter of the patients processed by trichrom stain and Kinyoun acid fast technique. Usually, through the procedure positive result is marked by the discovery of vacuolar form of the parasite. The result is considered to be significant if we discover more than 5 parasites per 400 × high-power field[12]. What is more, B. hominis can also be detected by polymerase chain reaction technique[15].

Acute appendicitis in human may occur in every stage of life span; however, the disease mostly occurs among the adults and young adults and men (7%) are more affected than women[16]. At first, acute appendicitis appears because of the increase of intra-luminal pressure that disturb venous circulation. For about 50%−80% cases are associated with the obstruction of appendix’s lumen, usually due to the feces mass resembling a little stone, called feces stone (decolite). The rarer etiologies are bladder stones, tumors, or masses from helminthes (Oxyuris vermicularis). Ischemic injury and static condition from the lumen’s contents facilitate bacterial proliferation and precipitate inflammation process, tissue edema and polymorphonuclear infiltration from the lumen unto muscular wall and peri-appendiculary soft tissue. At the first stage of the acute appendicitis there are edema and congestion of sub serous layer and infiltration of polymorphonuclear cells throughout all layers of the appendix’s wall[16].

Diagnosis of acute appendicitis can be established if there is infiltration of polymorphonuclear cells penetrating muscular layers. In severe cases, inflammatory exudates and polymorphonuclear cells may cause fibrinopurulent reaction, and if the process develops progressively, focal abscess within appendix’s wall can be called acute suppurative appendicitis[16].

Initially, clinical appearance of appendicitis is marked by a pain within peri-umbilical region, which subsequently shifts to the lower–right quadrant. Pressure pain within the lower–right quadrant is termed Mc Burney’s point. Another symptoms are nausea, vomiting or both; whereas the abdomen is palpated tightly, accompanied with mild fever and the increase of peripheral blood leukocytes[16].

2. Case report

Figure 1. Macroscopic appearance of the patient’s appendix.
  a) Long section of the appendix’s mass with 7 cm in length; b) Transversal section of both distal and proximal parts of the appendix; at distal, the section is lack of mucosa layer whilst at proximal, mucosal part remains exist shown as gelatin.

Figure 2. Transversal section of the patient’s appendix from proximal to distal parts.
  a, b show the proximal fraction of the appendix: all layers of the appendix (from mucosal up to serous layers); c, d, e show the distal fraction of the appendix; the wall becomes thin, mucosa disappears, and lumen is filled by gelatinous mass.
A 52-year-old male patient was hospitalized with abdominally painful symptoms. The patient was diagnosed with perforated appendicitis by surgeons and differentially diagnosed with appendix tumor. Subsequently, after appendectomy, the appendix tissue was sent to pathologists. By macroscopic examination, the appendix mass was measured with 7 cm in length and 1.5 cm × 2.5 cm in diameter (Figure 1). Transversal section demonstrated the widening of the appendix’s lumen, and the distal part was filled with a gelatinous mass (Figure 2). Microscopic examination with routine Hematoxillin–eosin stain toward the appendix’s transversal shape showed appendix in the proximal part (Figure 3), the mucosal, submucosal, and muscular layer were still appear, but the appendix in the distal part showed that muscular wall was tightening and thin (Figure 4). What is more, the lumen was filled by mucous substance in large amount, particularly within distal part, where most of the mucous layers were disappeared, and only left insignificantly in the proximal part. Interestingly, at the sub mucous layers of the distal section of the appendix, there was found numerous spherical structures that indicated B. hominis (Figure 5). In addition, there was infiltration of inflammatory cells, predominantly with polymorphonuclear cells (neutrophils) along with edema at sub mucous layer (Figure 6). Finally, according to both gross appearance and microscopic finding, the appendix mass was concluded as acute suppurative appendicitis with B. hominis.
blood supply to the appendix may be decrease, leads to the ischemic injury that facilitates bacterial growth[16]. In our case, the obstruction occurs because of the *B. hominis* parasite, which filled the appendix’s lumen and invade its mucous layers. Macroscopically, appendix’s wall became thin (at the distal region) and composed by gelatinous substance. Interestingly, this is a rare cause of acute appendicitis since most cases of acute appendicitis are generally caused by feces stones (focolites). Another rarer etiology is obstruction by *Oxyuris vermicularis*[16]; notwithstanding, *B. hominis*, as the causal agent of the disease has never been reported. *B. hominis* is a parasite within protozoan group that morphologically has 4 forms, which are vacuolar, granular, amoeboid, and cystic[2]. In our case, *B. hominis* found by microscopic finding is in the vacuolar form, with spherical appearance where in the middle of its body there is a transparently vacuolar structure. The vacuole is termed as central body surrounded by peripheral cytoplasm that contains nucleolus, mitochondria and Golgi apparatus[2]. The vacuolar form is the commonest form found in feces or culture[2]. In our case, vacular bodies of *B. hominis* have invaded and destroyed mucous layers of the appendix, albeit literally the parasite hardly ever destroys mucosa and invades tissues[1,8]. However, according to several cases that have been reported, *B. hominis* infection is also associated with ulcers within mucosal layers[2].

*B. hominis* infections of symptomatic patients generally show clinical manifestation as diarrheal[1,2,8,12,14]. Yet, in our case there is no diarrheal symptom, as the patient only complains about abdominal pain. The circumstance may due to the obstruction of appendix’s lumen by the vacular bodies of *B. hominis*, which also destroyed and invaded the mucosa, so that the clinical symptoms that appeared was the manifests of acute appendicitis.

We have reported a case of acute suppurative appendicitis of a 52-year-old male patient. The etiology of the case is obstruction by *B. hominis* infection within vacuum-form, which filled the appendix’s lumen, invaded and destroyed its mucous layers; a phenomenon with a very rare cause. Diagnosis was established based on histopathological examination of the appendix tissue with routine Hematoxilin–eosin stain.

Uniquely, in addition to the aforementioned finding, the patient showed clinical manifestation of acute appendicitis, especially abdominal pain; whilst the commonest symptom of *B. hominis* infection, which is diarrhea, was not demonstrated in this case.

**Conflict of interest statement**

We declare that we have no conflict of interest.

**References**

[1] Fenoglia–Preiser CM, Noffsinger AE, Stemmermann GN, Lantz PE, Isacson PG. Gastrointestinal pathology. An atlas and text. 3rd ed. USA: Walters Kluwer, Lippincott Williams & Wilkins. 2008, p. 834.

[2] Sutanto I, Ismid IS, Sjarifuddin PK, Sungkar S. Textbook of medical parasitology. 4th ed. Jakarta: Faculty of Medicine, University of Indonesia; 2008, p. 179–183.

[3] Prasetyo RH. Diagnosis of Blastocystis hominis in rat feces. Nusantara Med J 2006; 38: 174–175.

[4] Chuong LS, Suresh K, Mak JW, Ini I, Kathijah. Prevalence of Blastocystis in animals from domesticated surroundings. Southeast Asian J Trop Med Public Health 27(4): 850–852.

[5] Lu CT, Sung YJ. Epidemiology of Blastocystis hominis and other intestinal parasites among the immigrant population in northeastern Taiwan by routine physical examination for residence approval. J Microbiol Immunol Infect 2009; 42: 505–509.

[6] Amin OM. The epidemiology of blastocystis hominis in the United States. Res J Parasitol 2006; 1(1): 1–10.

[7] Senay H, MacPherson D. Blastocystis hominis: epidemiology and natural history. J Infect Dis 1990; 162(4): 987–990.

[8] Lamps LW. Infections diseases of the GI tract. In: Odze RD, Goldblum JR, Crawford JW, editors. Surgical pathology of the GI tract, liver, biliary tract, pancreas. Philadelphia: Saunders Elsevier; 2004, p. 51–52.

[9] Yaowalark S. Is Blastocystis hominis a human pathogenic protozoan? J Trop Med Parasitol 2001; 24: 16–22.

[10] Al-kaissi Elham, KJ Al–Maghi. Pathogenicity of Blastocystis hominis in relation to enteropathogens in gastroenteritis cases in Baghdad. Eur J Sci Res 2009; 25(4): 606–613.

[11] Sheehan DJ, Raucher BG, McKiritch JC. Association of Blastocystis hominis with signs and symptoms of human disease. J Clin Microbiol 1986; 24(4): 548–550.

[12] Magdalena LJ. Blastocystis hominis salah satu penyebab diare. Ebers Papyrus 1996; 2(1): 27–32.

[13] Tungtrongchit A, Manatsathit S, Kositchaiwat C, Ongrotchanakun J, Munkong N, Chinalubtr P, et al. Blastocystis hominis infection in irritable bowel syndrome patients. Southeast Asian J Trop Med Public Health 2004; 35(3): 705–710.

[14] Dogruman–Al F, Kustimur S, Yoshikawa H, Tuncer C, Simsek Z, Tanyuksel M, et al. Blastocystis subtypes in irritable bowel syndrome and inflammatory bowel disease in Ankara, Turkey. Mem Inst Oswaldo Cruz 2009; 104(5): 724–727.

[15] Stensvold R, Brilliowska–Dabrowska A, Nielsen HV, Arendrup MC. Detection of Blastocystis hominis in unpreserved stool specimens by using polymerase chain reaction. J Parasitol 2006; 92(5): 1081–1087.

[16] Turner Jerrold R. The gastrointestinal tract. In: Abbas K, Aster F, editors. Robbins and Cotran pathologic basis of disease. 8th ed. Philadelphia: Elsevier Saunders; 2010, p. 826–828.