Schistosomiasis as an unusual cause of appendicitis
B. Doudier, P. Parola, J. P. Dales, N. Linzberger, P. Brouqui and J. Delmont

1Service des Maladies Infectieuses et Tropicales, 2Laboratoire d’Anatomopathologie and 3Service de Chirurgie Digestive, Center Hospitalo-Universitaire Nord, Marseille, France

ABSTRACT

Millions of people originating from tropical areas now live outside the country of their birth. As a consequence, the number of cases of diseases imported from the tropics and being seen by European physicians in immigrants is growing. As an example of such diseases, schistosomal appendicitis is a specific trait of infection with Schistosoma haematobium and is an uncommon cause of appendicitis in non-endemic areas. Treatment requires anti-schistomal medication in addition to surgery. Physicians, including surgeons, need to be aware of the possibility of seeing atypical presentations of parasitic diseases in immigrant patients.

Keywords  Schistosomiasis, appendicitis, migrants

Clin Microbiol Infect 2004; 10; 89–91

Millions of people originating from tropical areas now live outside the country of their birth. International travel and migration are changing the epidemiology of some diseases seen by physicians in Europe. The number of cases of diseases imported from the tropics and being seen by European physicians in immigrants is growing. Malaria is the best example [1], but other diseases also fall into this category. Schistosomal appendicitis is a specific trait of infection with Schistosoma haematobium, which causes genitourinary schistosomiasis. This disease is endemic in 52 countries, including the African continent, the eastern Mediterranean, the Arabian peninsula, and some Indian Ocean islands. The life cycle of Schistosoma has been described in a recent review [2]. The presence in the tissues of S. haematobium eggs results in fibrosis, constriction and calcification of the urinary tract, as well as of all organs reached by the eggs, including the appendix.

Schistosoma ova are frequently found in the appendix of patients suffering from schistosomiasis in endemic areas. For example, in a study performed in Nigeria, digestion studies and histopathological examinations of various organs, including the appendix, were performed on 54 males and 34 females at autopsy (death not related to schistosomiasis), and found to be positive on bladder snip for schistosomiasis. In this study, the presence of eggs in the appendix was reported for 37% of the cases, with the incidence being proportional to the severity of the disease [3]. Interestingly, the intensity of infection in the seminal vesicles was second only to that of the bladder, and all patients with severe infection were positive for this localisation.

The role of schistosomiasis in the pathogenesis of appendicitis has been discussed previously [4]. Two types and pathogenic pathways of schistosomal appendicitis have been described. First, ‘granulomatous acute appendicitis’ is caused by an immunological granulomatous reaction to newly deposited ova, with tissue necrosis and tissue eosinophilia; it may occur early in the infection, i.e., within weeks. Second, ‘obstructive acute appendicitis’ is caused by long-standing inflammation and fibrosis around dead eggs, leading to obstruction of the appendiceal lumen and increasing the risk of infection from faecal contaminants; this may occur in the late phase after several months or years [4].

Although appendix involvement following schistosomal infection is frequent in endemic...
areas, it often seems to be asymptomatic. Consequently, the precise prevalence is poorly defined, as diagnosis requires histological examination. In a prospective study carried out in Nigeria over a 5-year period, 518 consecutive appendices were removed at surgery for symptomatic appendicitis and examined histologically. Of these, 32 (6.2%) appendices showed evidence of chronic *S. haematobium* appendicitis [5]. In another retrospective clinical and histological study carried out in Saudi Arabia, 15 of 1920 appendicectomy patients were found to have *Schistosoma* ova associated with appendicitis. Obvious clinical symptoms of schistosomiasis were absent from the clinical histories, showing that schistosomiasis can be indicated solely by digestive symptoms [6].

However, schistosomiasis remains an uncommon cause of appendicitis in non-endemic areas, and few cases have been described in the literature. In our own experience, a 24-year-old African was admitted to the department of surgery of our hospital with a 2-day history of acute abdominal pain. The patient had emigrated from Sierra Leone to France 8 months previously. On admission, the patient was afebrile. He had never experienced similar episodes before, and was otherwise healthy. Physical examination of the abdomen revealed right iliac fossa tenderness and guarding, and peritonism. There was no palpable abdominal mass. The remainder of the examination findings were within normal limits, except for an increased level of C-reactive protein (30 mg/L). Increased abdominal pain without any fever was noticed during the first 2 days of hospitalisation. On both abdominal X-ray and CT scan, calcifications of the genitourinary tract were noticed, typical of genitourinary schistosomiasis. Calcifications were also seen in the appendix, which was highly suggestive of schistosomiasis [2,7]. This diagnosis was supported by the fact that the patient originated from Sierra Leone, an area endemic for urinary and intestinal schistosomiasis, and the fact that several previous episodes of haematuria were reported retrospectively. No eggs of *S. haematobium* were detected by microscopic examination in the urine, even though both sedimented and centrifuged urine specimens were studied and filtration techniques were used. Examination of stools was also negative. Because the pain had been increasing for 2 days, an appendicectomy was performed, together with rectal and bladder biopsies. On cystoscopy, the bladder’s mucosae had a normal aspect. However, direct microscopic examination of the bladder and rectal biopsies (examined as crushed biopsy) revealed numerous live eggs, with mobile miracidia, that were identified as *S. haematobium*. The appendix was macroscopically inflamed, and histology revealed numerous schistosomal ova, mainly in the sub-mucosae. Most eggs were shown to be mineralised. Histology of both rectal and bladder biopsies also showed many calcified eggs of *S. haematobium*. Serology for *S. haematobium* infection, performed by haemagglutination, was positive (IgG: 1/128). After appendicectomy, the patient received one dose of praziquantel 20 mg/kg, repeated once after 4 weeks. The abdominal symptoms resolved, and no parasite eggs were seen in several urine microscopic examinations.

In 1997, the case of a septic 80-year-old with a perforated gangrenous appendix was reported [8]. Histology of the removed appendix showed the presence of calcified schistosoma ova in the wall of the appendix. No ova could be identified in the urine or faeces. This patient was born in China (an endemic area for *S. japonicum*) and had been living in Hong Kong (a non-endemic area) for 20 years. He could not recall any symptoms related to schistosomiasis. Also in 1997, in the UK, the case of a 24-year-old Ghanaian man presenting with acute abdominal pain was reported [9]. Following appendicectomy, histology of the appendix, which was macroscopically inflamed, revealed numerous ova associated with acute inflammation. In addition to these cases, schistosomal appendicitis has also been reported in travellers [10].

In conclusion, it is not uncommon for surgeons to attend patients who have resided in areas endemic for schistosomiasis [9]. Systematic histological examination is needed for diagnosis and specific medical treatment, particularly when X-ray and other radiological examinations do not give a clear diagnostic indication. Treatment of symptomatic schistosomal appendicitis requires anti-schistosomal medication in combination with appendicectomy. Therapeutic options for schistosomiasis, including praziquantel, have been reviewed elsewhere [2]. Physicians and microbiologists in Europe should be aware of the increasing incidence of this and other diseases associated with population migration [11].

© 2004 Copyright by the European Society of Clinical Microbiology and Infectious Diseases, CMI, 10, 89–91
REFERENCES