International Journal of Sciences

Research Article Volume 10 – August 2021 (08)

Perforated Acute Abdomen in a Immunossuppressed Patient due to *Strongyloides stercoralis* Hyperinfection Syndrome

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Abstract: Strongyloidiasis is caused by *Strongyloides stercoralis*, an endemic parasite in tropical regions of the world. The symptoms are mostly indolent and related to the gastrointestinal tract, however in immunosuppressed individuals, the disease can escalate to critical conditions due to a hyperinfection. This study aims to report a case of an elderly patient in oncologic treatment for a laryngeal cancer, who presented a perforated acute abdomen that required emergency laparotomy with an enterectomy, whose anatomopathological analysis revealed an important *Strongyloides* infection.

Keywords: Strongyloidiasis, Hyperinfection Syndrome, Intestinal Perforation, Immunosuppression

Introduction:

Strongyloidiasis is a helminthiasis caused by S*trongyloides stercoralis*, a nematode endemic in tropical countries such as Brazil. It usually affects the gastrointestinal tract and occasionally the lungs due to its life cycle. (1,6,7) Although most cases manifest themselves asymptomatically or with mild symptoms, immunosuppressed patients can develop disseminated disease and a severe hyperinfection. These infirms often present severe and refractory sepsis with unfavorable outcomes. (3,5) The diagnosis of strongyloidiasis is based on the microscopic identification of larvae (rhabditiform and occasionally filariform) in the stool or duodenal fluid. However, their presence in histopathological analyses has increased in recent years due to the large amount of hyperinfection cases in immunocompromised patients. The aim of this report tis to present the case of one of those patients, who was admitted to our service with perforated acute abdomen due to a *Strongyloides* hyperinfection syndrome.

Case report:

The patient was a 71-year-old man in oncological care due to a poorly differentiated carcinoma of larynx, ongoing chemotherapy and radiation therapy due to residual disease. The cancer diagnosis had been made four months before this report. He was admitted to the emergency room with complaints of abdominal pain, nausea and emesis initiated 8 hours before the admission. Physical examination revealed him to be very weak, slim, hypotensive, tachycardic and with peritonitis. The blood count presented leukocytosis (14360/mm^3) with left shift, but without eosinophilia. A CT scan showed a moderate amount of free fluid in the abdominal cavity, with signs of possible pneumoperitoneum (Figure 1). Exploratory laparotomy was indicated, in which moderate amount of serous liquid was evidenced in the cavity, as well as a perforated diverticulum at one meter from the angle of Treitz. As a result, a segmental enterectomy with primary anastomosis was performed (Figure 2).

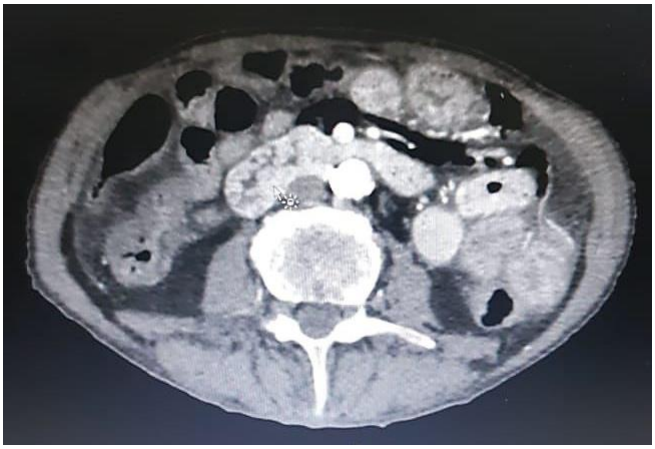

Figure 1. Abdominal CT scan (axial view) evidencing hyper-uptake zones in small intestine bowels, suggesting peritonitis, also associated with signs of pneumoperitoneum dissecting the mesenteric root.

Abdominal CT scan (axial view) evidencing hyper-uptake zones in thin intestinal loops, suggesting peritonitis process. Associated with signs of pneumoperitoneum dissecting the root of the mesenteric.

Published at: http://www.ijsciences.com/pub/issue/2021-08/
DOI: 10.18483/ijSci.2481; Online ISSN: 2305-3925; Print ISSN: 2410-4477

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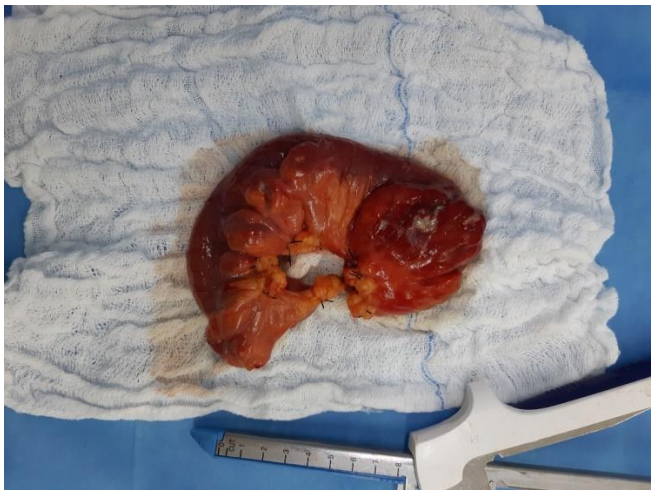

Figure 2. Macroscopic view of resected jejunal segment showing perforated diverticulum.

After the procedure, he developed an apparent hemodynamic improvement, but worsening of the respiratory condition. On the sixth post-operative day, the pathological result of the surgical specimen showed an important infestation by *Strongyloides stercoralis*, and therefore drug treatment with Ivermectin was started considering a hyperinfection condition triggered by the parasite. Three days later, the patient again presented significant clinical worsening and was re-approached due to possible anastomotic dehiscence, which was confirmed and repaired during surgery. Despite all the measures, he evolved with septic shock refractory to antimicrobial therapies, multiple organ failure, followed by death a few days later.

Discussion:

Strongyloidiasis still represents a cause of helminthiasis with the potential of catastrophic outcomes, mainly in tropical regions, where there are higher rates of poor sanitation and hygiene conditions (3, 6, 7). Although most cases remain asymptomatic for a long time or with mild gastrointestinal symptoms, severe infections at risk of death can occur and should always be included in the differential diagnosis of acute abdomen in endemic areas, as severe gastrointestinal symptoms, due to increased parasitic load, occur in hyperinfection syndrome (9, 10). The pathogenesis occurs when the reinfection cycle begins and the parasitic intraluminal load increases. The filariform larvae of *S. stercoralis* invade the intestinal walls and can spread through the lymphatic and hematogenous pathways to distant organs, such as liver, pancreas, lungs and central nervous system, triggering an intense multisystemic inflammatory response (5, 11, 12). This hyperinfection is usually accompanied by Gram-negative septicemia somehow facilitated by infectious filariform larvae through the intestinal mucosa, leading to high mortality rates (3, 6). Severe cases of autoinfection are invariably associated with a clear cause of immunosuppression, namely: corticosteroid therapy, chemotherapy agents, chronic immunodeficiency, intestinal motility disorders, chronic renal failure, diabetes mellitus, malnutrition, alcoholism, malignant diseases, post-transplant and HTLV-1 infection (1, 5, 10, 12). Clinically, these severe forms of infection can be preceded by watery diarrhea, abdominal cramps, and often indolent weight loss. Hematemesis, partial obstruction of the small intestine and paralytic ileus have also been reported, but intestinal perforation is rarely described (3, 7). In 2015, Figueira et al. (3) described the case of perforated abdomen with ileal loop necrosis in a patient with intestinal motility disorder who, despite surgical treatment, died of septicemia. In 2012, Romero-Cabello et al. (11) also reported a similar case of hyperinfection by postmortem diagnosed strongyloidiasis in an HIV-positive patient, after analysis of a resected surgical specimen. In the present report, the pathological finding was suppurative perforated diverticulitis with severe infestation by *Strongyloides stercoralis*.

The diagnosis of severe forms of *S. stercoralis* infection is challenging and therefore a high degree of clinical suspicion is necessary (3, 6, 10). Imaging studies are not specific, and eosinophilia is infrequent in states of immune depression (2,3,4). The diagnosis can be confirmed by low-invasive methods. Therefore, high suspicion in high-risk patients should be followed by obtaining biological materials (gastric or duodenal aspirate and tracheal fluid) or biopsies of suspicious lesions so that treatment can be started early (8). However, what is commonly observed are late incidental diagnoses by surgical specimens in patients with severe conditions (3, 5). In the present case, the diagnosis of strongyloidiasis hyperinfection was made only after surgery by pathological examination of the surgical specimen. Although specific antiparasitic treatment with ivermectin was installed, the advanced damage and complications of intestinal perforation and secondary bacterial sepsis greatly hindered the patient's response to treatment, leading to his death. Thus, this report highlights the importance of preoperative evaluation of immunosuppressed conditions, even in emergency situations, as they can lead to potentially fatal complications (2, 8,10).

Conclusion:

The possibility of *Strongyloides stercoralis* hyperinfection should be considered in the differential diagnosis of acute abdomen in immunosuppressed patients, especially in endemic regions. Appropriate and timely therapy prior to the development of significant abdominal complications, such as perforation and peritonitis, may reduce the high mortality rates observed.

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