

Review

# Intestinal Obstruction from Ascariasis: Report of a case in a 4 year old child

Adama Zida<sup>1,2</sup>, Kiswendsida Thierry Guiguemdé<sup>2,3\*</sup>, Patindoilba Marcel Sawadogo<sup>1,2</sup>, Flora Coulibaly<sup>4</sup>, Benjamin Ouédraogo<sup>5</sup>, Ibrahim Sangaré<sup>6</sup> and Sanata Bamba<sup>6</sup>.

<sup>1</sup>Department of Parasitology-Mycology, Yalgado Ouédraogo University Hospital, Ouagadougou, Burkina Faso.

<sup>2</sup>Laboratory of Parasitology-Mycology, UFR SDS, Joseph Ki-Zerbo University, Ouagadougou, Burkina Faso.

<sup>3</sup>Department of Parasitology-Mycology, Charles de Gaulle Pediatric University Hospital, Ouagadougou, Burkina Faso.

<sup>4</sup>Department of Pediatrics, Yalgado Ouédraogo University Hospital, Ouagadougou, Burkina Faso.

<sup>5</sup>Department of Food safety, National Public Health Laboratory, Ouagadougou, Burkina Faso.

<sup>6</sup>Department of Parasitology-Mycology, Souro Sanou University Hospital, Bobo Dioulasso, Burkina Faso.

Received 8 March, 2023; Accepted 12 May, 2023

***Ascaris lumbricoides* is an intestinal nematode of humans. The parasite has been associated with intestinal pathology, respiratory symptoms and malnutrition in children in endemic areas. We report a case of digestive ascariasis complicated by intestinal obstruction in a 4-year-old boy. On admission, the symptomatology was marked by abdominal pain and vomiting in which adult of *A. lumbricoides* worms were demonstrated. The biological workup identified the worm and demonstrated *A. lumbricoides* eggs in the stools. Moderate anemia and metabolic acidosis were noted. An abdominal X-ray and abdominal ultrasound provided evidence of an intestinal obstruction. A single dose of 400 mg of Albendazole tablets administered orally, combined with management of dehydration, resulted in a favorable remission after 48 h, with cessation of vomiting, resumption of transit and regaining of appetite. This case of ascariasis complicated by intestinal obstruction highlights the need to systematically carry out a parasitological examination of the faeces in the presence of any digestive disorder in persons at risk, particularly children living in rural areas in tropical zones.**

**Key words:** Geohelminthiasis ascariasis, *Ascaris lumbricoides*, intestinal nematode, intestinal obstruction, children.

## INTRODUCTION

Intestinal nematodiasis caused by geohelminths, such as *Ascaris lumbricoides*, *Trichuris trichiura*, *Ancylostoma duodenale* and *Necator americanus*, affect more than one billion people worldwide (Veesenmeyer et al., 2022).

*A. lumbricoides* is the largest of the human intestinal nematodes and has been associated with intestinal pathologies, respiratory symptoms and malnutrition in children in endemic areas (Hagel et al., 2010). The

\*Corresponding author. E-mail: [guiguemde@gmail.com](mailto:guiguemde@gmail.com) , Tel: (226) 67181827.

Author(s) agree that this article remain permanently open access under the terms of the [Creative Commons Attribution License 4.0 International License](https://creativecommons.org/licenses/by/4.0/)

parasite is transmitted by ingestion of embryonated eggs from contaminated faeces. Ascariasis has a high endemicity in tropical and subtropical areas.

Predisposing factors include poverty, poor sanitation, inadequate sewage disposal and poor hygiene (Leung et al., 2020). School-aged children tend to harbour the greatest number of intestinal worms and, as a result, suffer more adverse health consequences, such as poor growth, anaemia, and cognitive decline (Hagel et al., 2010). Burkina Faso has implemented preventive chemotherapy against lymphatic filariasis since 2001 (Serme et al., 2022). This preventive chemotherapy, taking into account geohelminthiasis and combining Ivermectin with Albendazole, has contributed to a significant reduction in the prevalence of geohelminthiasis in the country (Serme et al., 2022). The control of geohelminthiasis combined with the improvement of living conditions has led to a decrease in the incidence of geohelminthiasis in the country, so that cases of ascariasis with visceral complications have become exceptional and rare in the country. We report a case of ascariasis complicated by intestinal obstruction in a 4-year-old boy in the city of Ouagadougou, Burkina Faso.

## PRESENTATION OF THE CASE

The patient is a 4-year-old male child residing in Port-Bouet, Republic of Côte d'Ivoire. He has been in Ouagadougou in Burkina Faso since 13 January, 2023. On 18 January, 2023, he was received in consultation at the emergency medical service of the Yalgado Ouédraogo University Hospital of Ouagadougou for abdominal pain and vomiting. The clinical examination showed a fairly good general condition, an occlusive syndrome made of persistent vomiting with presence of worms, abdominal pain with cessation of matter and gas. There was no fever (axillary temperature = 37.5°C). Questioning of the parents reported that the family's drinking water source was underground, including a fountain.

Macroscopic examination of the worms isolated from the vomitus identified pinkish-white adult *A. lumbricoides* worms with an average length of 13 cm (Figure 1A).

A blood sample was taken and a CBC showed moderate microcytic anaemia (haemoglobin = 10.3 g/L GMV=73.1 fL), reactive thrombocytosis (platelets = 526 G/L) and monocytosis (monocytes = 0.76 G/L). There was no eosinophilia. Blood ionogram showed hyponatraemia (NA<sup>+</sup> = 131 mmol/L) and organic metabolic acidosis (Bicarbonates = 12 mmol/L). The blood transaminase level was normal. Thick blood film and blood smear for blood parasites were negative.

The abdomen X-ray and the complementary abdominal ultrasound, performed on the day of admission, showed the presence of hydroaerosic level, dilatation of the ansae and mesenteric adenolymphitis, concluding to a radiographic aspect in favour of a functional intestinal

obstruction (Figure 2).

The clinical and paraclinical arguments led to the diagnosis of intestinal ascariasis complicated by intestinal obstruction in a 4-year-old child.

The curative treatment consisted of oral administration of 400 mg of Albendazole in tablet form. This treatment was combined with venous rehydration with isotonic saline. A favorable remission was observed after 48 h with cessation of vomiting, resumption of transit with emission of faeces and regaining of appetite.

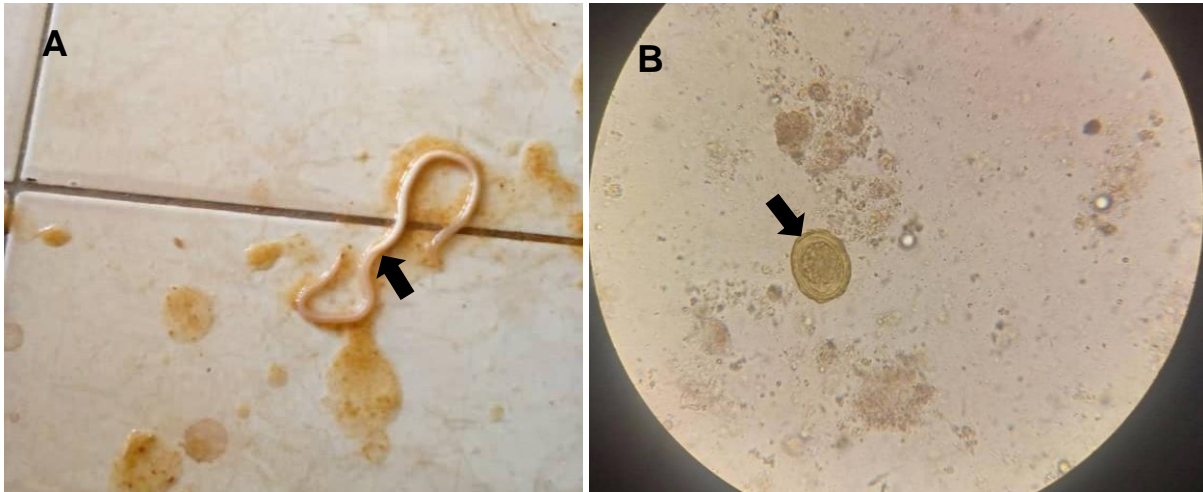
After 5 days of hospitalization, parasitological examination of the follow-up faeces still showed *A. lumbricoides* eggs (Figure 1B). The improvement of the patient's clinical condition allowed him to be discharged with a follow-up appointment one week later for a parasitological examination of the follow-up faeces. The result of the parasitological examination of the faeces had come back negative.

## DISCUSSION

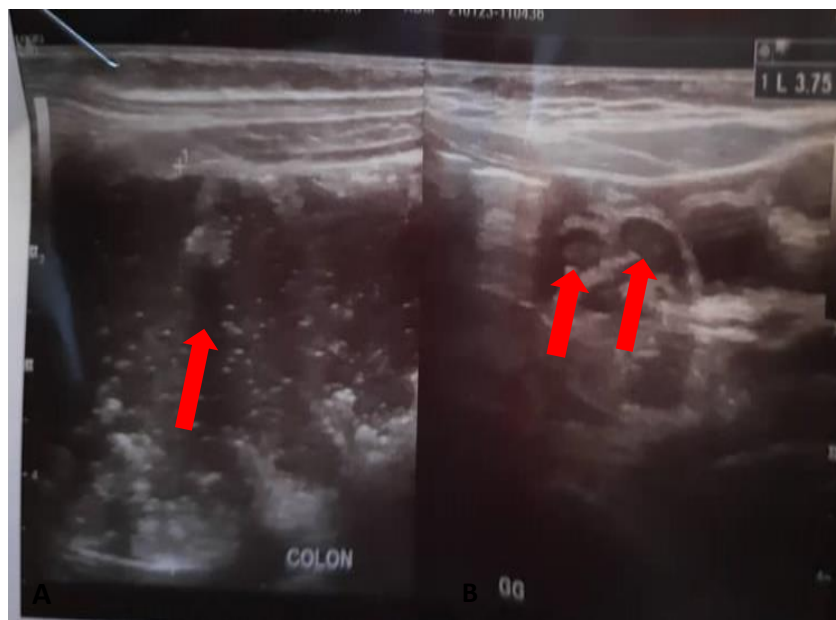
Cases of ascariasis with intestinal obstruction are rarely reported in Burkina Faso. Since the implementation of the neglected tropical diseases control program (PNLMTN) in the early 2000s, cases of ascariasis, like other geohelminthiasis, which were once very prevalent in the country, have now become rare. This is the first time that a case of ascariasis complicated by intestinal obstruction in a child of such a young age (4 years old) has been reported. Elsewhere in the world, cases of ascariasis with obstructive complications have been reported. A case similar to ours was reported by Elmi et al. (2022) in Somalia in a 6-year-old boy. On admission, the child presented with an intestinal obstruction syndrome. The surgical operation had removed a bundle of roundworms from the jejunum (Elmi et al., 2022). Andrade et al. (2015) reported in Mexico a case of intestinal ascariasis in a 3-year-old girl admitted to the emergency room with abdominal pain, diarrhoea and vomiting with emission of adult roundworms in faeces and vomit.

*A. lumbricoides* infestation present with cholecystitis, cholangitis, pancreatitis, intestinal volvulus, intussusception, appendicitis, and intestinal necrosis (Wani et al., 2010). Complications can be observed at all ages, but children between 3 and 5 are particularly susceptible, caused by a large number of worms in a decreased intestinal diameter and the ileocolic valve. *A. lumbricoides* excretes a neurotoxin, which produces spasticity resulting in obstruction, and intestinal inflammation, may be associated with the release of other toxins, including anaphilotoxins, haemolysins and endocrinolysins by the worms (Baba et al., 2009; Mishra et al., 2008). Common symptoms include abdominal pain, nausea, vomiting, diarrhoea, and the presence of worms in vomit or faeces (López et al., 2010).

Abdominal plain x-ray (APS) can reveal airborne fluid



**Figure 1.** (A) Adult *Ascaris lumbricoides* in vomitus and (B) *Ascaris lumbricoides* egg on faeces microscopy. Source: Parasitology Lab, CHUYO 2023



**Figure 2.** Aperistaltic dilatation of the ansa (A) with the presence of coeliomesenteric nodes and (B) on abdominal ultrasound. Source: Parasitology Lab, CHUYO 2023

levels and roundworm shadowing, with a "Whirlpool" image in some cases (Andrade et al., 2015). Ultrasound will be helpful in identifying a thick echogenic band with a central anechoic tube, multiple linear or curvilinear echogenic bands without acoustic shadowing, "railroad track" sign; Appearance of "3-line" or "4-line" or "bull's-eye" sign on the cross-sectional scan (Andrade et al., 2015).

Moderate anaemia was associated with case's infection. An association between malnutrition, anaemia and

intestinal nematodosis is regularly reported in the literature (López et al., 2010; Kumar et al., 2003). Metabolic acidosis and mild hyponatraemia were also noted. Indeed, the literature reports cases of ascariasis, especially with visceral lesions, such as pancreatitis associated with abnormalities of biochemical parameters, such as hyponatraemia, acidosis and haematological parameters such as hyperleukocytosis (Andrade et al., 2015; Hsia et al., 1995).

In case of intestinal obstruction, medical treatment with

intravenous electrolytes, broad-spectrum antibiotics, antihelminthic drugs and nasogastric drainage should be performed. Patients with complete obstruction would be candidates for laparotomy after initial resuscitation and antibiotic treatment (Andrade et al., 2015).

## CONCLUSION

This case of ascariasis complicated by intestinal obstruction highlights the need to systematically perform a parasitological examination of the faeces in case of any digestive disorder, in people at risk, especially children living in rural areas, in tropical zones. It also indicates the need to update data on the prevalence of geohelminthiasis in Burkina Faso, through a national post chemoprevention survey against geohelminthiasis.

## CONFLICT OF INTERESTS

The authors have not declared any conflict of interests.

## REFERENCES

- Andrade AM, Perez Y, Lopez C, Collazos SS, Andrade AM, Ramirez GO, et al. (2015). Intestinal Obstruction in a 3-Year-Old Girl by *Ascaris lumbricoides* Infestation: Case Report and Review of the Literature. *Medicine (Baltimore)* 94(16):e655. doi: 10.1097/MD.0000000000000655.
- Baba AA, Ahmad SM, Sheikh KA (2009). Intestinal ascariasis: the commonest cause of bowel obstruction in children at a tertiary care center in Kashmir. *Pediatric Surgery International* 25(12):1099-102. doi: 10.1007/s00383-009-2486-8.
- Elmi AM, Çelik C, Ali Jama SM, Dirie AM, Gedi Ibrahim I (2022). Intestinal obstruction in a child with massive ascariasis and associated acute appendicitis: A case report. *Annals of Medicine and Surgery* 78:103808. doi: 10.1016/j.amsu.2022.103808.
- Hagel I, Giusti T (2010). *Ascaris lumbricoides*: an overview of therapeutic targets. *Infectious Disorders - Drug Targets* 10(5):349-67. doi: 10.2174/187152610793180876.
- Hsia SH, Chang MH (1995). Ascariasis associated with acute pancreatitis in a child. *Zhonghua Min Guo Xiao Er Ke Yi Xue Hui Za Zhi* 36(2):128-30. PMID: 7793278.
- Kumar CS, Anand Kumar H, Sunita V, Kapur I (2003). Prevalence of anemia and worm infestation in school going girls at Gulbargha, Karnataka. *Indian Pediatrics* 40(1):70-2. PMID: 12554927.
- Leung AKC, Leung AAM, Wong AHC, Hon KL (2020). Human Ascariasis: An Updated Review. *Recent Patents on Inflammation and Allergy Drug Discovery* 14(2):133-145. doi: 10.2174/1872213X14666200705235757.
- López L, Cáceres R, Servin J, Esquivel J, Chirico M, Rodriguez-Morales AJ (2010). Surgical diagnosis and management of intestinal obstruction due to *Ascaris lumbricoides*. *Surgical Infections* 11(2):183-185. doi: 10.1089/sur.2008.103.
- Mishra PK, Agrawal A, Joshi M, Sanghvi B, Shah H, Parelkar SV (2008). Intestinal obstruction in children due to Ascariasis: a tertiary health centre experience. *African Journal of Paediatric Surgery* 5(2):65-70. doi: 10.4103/0189-6725.44178.
- Serme M, Zida A, Bougma R, Kima A, Nassa C, Ouedraogo M, et al. (2022). Evaluation of therapeutic coverage of mass treatment campaign against lymphatic filariasis in two health districts in Burkina Faso. *Médecine tropicale et santé internationale* 2(4) :mtsi-v2i4.. doi: 10.48327/mtsi.v2i4.2022.174.
- Veesenmeyer AF (2022). Important Nematodes in Children. *Pediatric Clinics of North America* 69(1):129-139. doi: 10.1016/j.pcl.2021.08.005.
- Wani I, Rather M, Naikoo G, Amin A, Mushtaq S, Nazir M (2010). Intestinal ascariasis in children. *World Journal of Surgery* 34(5):963-968. doi: 10.1007/s00268-010-0450-3.