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Case Report

Ascaris lumbricoides in the right nasal cavity: An unusual presentation in a paediatric patient

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Abstract

Ascaris lumbricoides is the largest intestinal nematode, commonly known as the roundworm. Ascariasis is one of the most neglected tropical diseases worldwide. It is the most common parasitic infection, posing a significant public health problem, especially in areas with poor sanitation and hygiene. An estimated 800 million to 1.2 billion people worldwide are affected by ascariasis. The life cycle of *Ascaris lumbricoides* is complex, with humans serving as the definitive host. The cycle begins with the ingestion of embryonated eggs through contaminated food, water, or poor hygienic practices. Most infections are asymptomatic, but chronic cases, especially in children, can cause malnutrition, growth delays, and cognitive impairments. The migrating worms can cause complications such as intestinal obstruction, perforation, cholangitis, and pancreatitis, which may require emergency surgery. Rarely, adult worms migrate to unusual sites such as the appendix, liver, ear, or nasal cavities, leading to respiratory distress and possible aspiration. The present report describes a rare case of a 4-year-old child with nasal discharge from the right nostril and a history of pica. During physical examination, a cord-like structure was removed from the right nostril and identified as Ascaris lumbricoides. This case highlights the unusual ectopic migration of intestinal nematodes.

Keywords: *Ascaris lumbricoides*, Nematode, Nasal cavity, Pica.

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1. Introduction

Ascaris lumbricoides is the largest intestinal nematode, commonly known as the Roundworm. Ascariasis is one of the most neglected tropical diseases worldwide.[1] It is the most common parasitic infection posing a significant public health concern, particularly in regions with poor sanitation and hygiene.[2]

It is estimated that approximately 800 million to 1.2 billion people are affected by ascariasis worldwide, predominantly in tropical and subtropical areas, including Sub-Saharan Africa, Latin America, China, and East Asia.[3,4] Most of the infections are asymptomatic, but chronic infections, particularly in children, may result in malnourishment, growth retardation, and impaired cognitive functions. It is estimated that ascariasis leads to 1.31 million disability -adjusted life years.[3,4,11]

The life cycle of *Ascaris lumbricoides* is complex, where humans act as the definitive host. The life cycle begins with the ingestion of embryonated eggs through contaminated food and water or poor hygienic practices.[5,6] On ingestion, the eggs hatch into larvae in the small intestine. The larvae penetrate the intestinal wall and travel to the liver and lungs via the bloodstream. Once it reaches the lungs, the larvae undergoes further development, breaks through the alveolar wall, and enters the bronchi. It ascends the bronchial tree and reaches the pharynx, where they are swallowed back down into the gastrointestinal tract. After returning to the small intestine, larvae mature into adult worms. Adult worm can live up to 1-2 years, female worm produces 2,00,000 eggs per

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day, which are passed in stool, then the life cycle continues.[7-9]

Ascariasis can range from asymptomatic to severe, life-threatening complications, depending on parasitic load and the organs involved. The migrating worms may result in complications such as intestinal obstruction, intestinal perforation, cholangitis, and pancreatitis, which may necessitate emergency surgery.[10-12]

Children are more susceptible to parasitic infections, which may lead to severe protein-energy malnutrition, vitamin A deficiency, and growth retardation. Adult worms migrate to the lungs via the bloodstream, which may result in Loeffler's syndrome, characterized by cough, dyspnoea, wheezing, and eosinophilia. On rare occasions, adult worms migrate to unusual sites such as the appendix, liver, ear, or the nasal cavities, causing respiratory distress and potential aspiration.[5,6,13,14]

The first case of *Ascaris lumbricoides* in the nose/paranasal sinuses was documented by Prof. H. Burger[14] in 1918 in a 14-year-old girl. The present report describes a rare case of a 4-year-old child with nasal discharge from the right nostril with a history of pica. During physical examination, a cord-like structure was removed from the right nostril and identified as *Ascaris lumbricoides*. This case highlights the unusual ectopic migration of intestinal nematodes.

2. Case Presentation

A 4-year-old girl was brought to our paediatric outpatient clinic with complaints of nasal blockage and persistent foul-smelling discharge from the right nasal cavity for 20 days. The patient came from a nearby rural village and had a low socio-economic background. No history of epistaxis was noted. No history of traumatic injuries or foreign body insertion. Her parents informed that the child had a history of pica, specifically the habit of eating mud for the past several months.

The patient was well oriented to time, place, and person and had no significant family history. On examination, she appeared pale but was afebrile and hemodynamically stable. The laboratory investigation showed her haemoglobin level was moderately low (10.2 g/dL) and slightly raised eosinophil count (approx. 560 cells/cmm)

On further physical examination, a vague swelling was noted on the right side of the nostril, accompanied by foul-smelling discharge. Cervical lymphadenopathy was not noticed. On palpation, tenderness was felt around the lateral part of the nose and the maxillary sinus area on the right side. Gentle traction was applied, revealing a cord-like structure. The anterior rhinoscopy revealed a cord-like structure attached to the middle meatus of the right nasal cavity. The cord-like structure resembled a worm, which was pale and approximately 16 cm in length.

For further identification, the worm was sent to the microbiology laboratory. On macroscopic examination, it was identified as *Ascaris lumbricoides*.(**Figure 1**) The wet mount preparation revealed bile-stained fertilized eggs of Ascaris lumbricoides. The egg was round in shape, featuring a thick, mamillated outer shell, and measured approximately 60 × 50 μm. (**Figure 2**) Microscopic examination of H&E-stained sections of the worm revealed a predominantly gravid segment of *Ascaris lumbricoides* containing eggs. (**Figure 3**)

The patient was started on anti-parasitic treatment with Albendazole (400 mg) with iron supplementation.

Figure 1: The image shows pale, cylindrical, unsegmented, elongated worms characteristic of *Ascaris lumbricoides.*

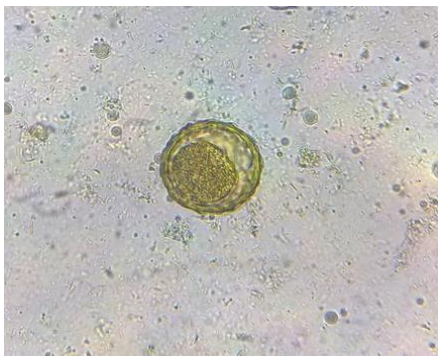

Figure 2: Wet mount showing a round, bile-stained fertilized egg of *Ascaris lumbricoides* with thick, mamillated outer layer

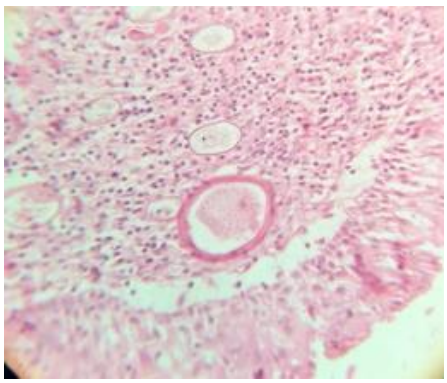

Figure 3: H&E-stained section of *Ascaris lumbricoides*

Table 1: Summary of various studies highlighting migration of *Ascaris lumbricoides* at usual sites.

Author	Patient Profile	Anatomical Site	Clinical presentation	Diagnostic Findings
Present study	4-year-old girl	Right nasal cavity	Foul-smelling nasal discharge for 20 days	Microscopic examination revealed bile-stained, thick, mamillated eggs of Ascaris
Sahar Iqbal et al.[3]	3-year-old girl	Right maxillary sinus and right nasal cavity	Nasal blockage and nasal discharge	Histopathological staining of pus and necrotic tissue showed calcified eggs and fragmented body parts suggestive of Ascaris lumbricoides
Saha KL et al.[2]	9-year-old girl	Right maxillary sinus	Dull aching pain over the right maxillary sinus area and foul-smelling discharge from the right nostril	Radiographic examination showed right maxillary sinus haziness. With help of an endotracheal intubation examination was done, which revealed adult worms.
Naravane A et al.[4]	Adult Jamaican patient	Paranasal sinuses	Nasal discharge and foul discharge	Histopathological examination was done
Ali Acar et al.[12]	25-year-old adult	Lungs	Cough, dyspnoea, and fever	Chest X-ray showed bilateral lower-zone consolidation. Peripheral eosinophilia with elevated total IgE level. Stool examination found *Ascaris* eggs.
Análida Elizabeth et al.[13]	54-year-old woman	Liver	Weight loss and abdominal pain in the epigastrium and upper right quadrant	Histological examination of liver abscess revealed eggs of *Ascaris lumbricoides*, and abundant Charcot-Leyden Crystals were found.

3. Discussion

According to the World Health Organization, India accounts for a significant proportion of the global burden of ascariasis. It is the most common parasitic infection with a prevalence rate of 20% to 60% among the rural population of India.[2-4]

The disease is more prevalent among school-going children due to frequent exposure to contaminated soil and poor hand hygiene practices.[7,8] In India initiative was taken to reduce infections caused by soil-transmitted helminths through the establishment of programs such as the National Deworming Programme launched by the Ministry of Health and Family Welfare in 2015. This program aims to provide mass deworming treatment using albendazole to all children aged 1-19 years in schools and Anganwadi centres.[16]

The School Health Programme under the National Health Mission adopts an integrated approach to child health, incorporating periodic deworming, anaemia control measures, and nutritional supplementation to mitigate morbidity associated with parasitic infections.[16]

Initiated in 2020 under the Ayushman Bharat framework, the School Health and Wellness Programme focuses on training teachers and health personnel to deliver comprehensive health education, emphasizing hygiene promotion, sanitation, and deworming awareness among schoolchildren.

In children, chronic ascariasis contributes to malnourishment, iron-deficiency anaemia, impaired growth, and poor cognitive function. In a few cases, it may result in severe complications such as intestinal obstruction, intestinal perforation, liver abscess, biliary duct obstruction, Loeffler's syndrome and respiratory distress due to blockage of nasal cavities and sinuses.[2,13,14]

Ascaris lumbricoides has ectopic migration, but its infestation in the nasal cavities is rare. The present case report describes a rare case of a 4-year-old child with right-sided nasal blockage due to *Ascaris lumbricoides.* The first case of *Ascaris lumbricoides* in the nose/paranasal sinuses was documented by Prof. H. Burger[14] in 1918 in a 14-year-old girl. Another similar case was reported by Naravene et al.[4] in 1997, where 3 mature adult worms of *Ascaris lumbricoides* were found in maxillary sinuses and 3 in the sphenoid sinus during routine sagittal section of the head and neck region. The summary of similar cases of ectopic migration of *Ascaris lumbricoides* at usual sites is shown in **Table 1**.

In the mid-20th century, Makidono[15] described the movement of adult Ascaris lumbricoides using real-time fluoroscopic imaging. His observations helped explain how adult worms can cause intestinal obstruction and migrate to unusual sites such as biliary ducts and nasal or oral cavities. Therefore, in this case, the adult worms might have migrated to the nasal cavities during their migration to the lungs.

4. Limitations

Several limitations of this case report merit consideration. First, advanced imaging studies, such as paranasal sinus radiography, endoscopic imaging, and computed tomography, were not performed, which could have provided valuable information regarding the extent of sinonasal

involvement and ectopic migration of the worm. Similarly, post-treatment imaging and follow-up stool examinations were not conducted, limiting the ability to confirm complete eradication of the parasite and assess for potential sequelae.

Second, stool screening and deworming of household contacts were not performed, which could have identified asymptomatic carriers and prevented potential reinfection within the family. In endemic settings, routine family screening and simultaneous treatment should be considered to break the transmission cycle of Ascaris lumbricoides.

As this is a single case report, it cannot be used to generalize about the epidemiology, risk factors, or clinical spectrum of nasal ascariasis in children. Future community-based studies are needed to determine the prevalence of unusual presentations, explore contributing factors like pica and poor sanitation, and evaluate the effectiveness of community-level interventions. Strengthening public health strategies—including hygiene education, improved sanitation infrastructure, and regular mass deworming programs—remains crucial to lowering the burden of ascariasis in rural populations.

5. Conclusion

This case highlights an unusual presentation of *Ascaris lumbricoides* infestation involving the nasal cavity in a paediatric patient, underscoring the diverse and sometimes unexpected manifestations of helminthic infections. Such atypical presentations emphasize the importance of clinical vigilance, especially in children from rural or low-socioeconomic backgrounds.

Improving community awareness regarding personal hygiene, safe sanitation practices, and the health risks associated with pica is essential in preventing similar occurrences. Strengthening national deworming programs and ensuring their regular implementation in school-aged children can significantly reduce the parasitic load within communities and prevent rare extraintestinal manifestations.

Overall, this case reinforces the need for a comprehensive, community-based approach that integrates clinical management with sustained public health interventions focusing on hygiene education, improved sanitation, and periodic mass deworming to curb the burden of parasitic infection.

6. Source of Funding

None.

7. Conflict of Interest

None.

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