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Unusual Cause of Life-Threatening Severe Anemia: A Rare Case of Pediatric Leech Infestation: A Case Report

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ABSTRACT

INTRODUCTION: Leech infestation (hirudiniasis) is a rare but potentially life-threatening condition, particularly in pediatric populations living in rural or resource-limited settings. It commonly occurs following exposure to untreated freshwater sources and may present with a wide range of clinical manifestations depending on the site of attachment. Due to its rarity and nonspecific presentation, diagnosis is often delayed or missed, increasing the risk of severe complications such as significant blood loss and anemia.

CASE PRESENTATION: We present a 4-year-old male patient admitted with a one-week history of bright red blood vomiting associated with generalized body weakness, epigastric pain, and low-grade fever. The child had a history of exposure to irrigation dam water used for domestic purposes, suggesting ingestion of contaminated water as the likely source of infestation. On examination, he had severe pallor with laboratory findings revealing severe anemia (hemoglobin: 3.8 g/dL). Initial management included stabilization with blood transfusion and supportive care. During hospitalization, the diagnosis was confirmed when the patient spontaneously expelled a live leech during vomiting, after which he showed marked clinical improvement.

CONCLUSION: This case highlights the importance of considering leech infestation as a differential diagnosis in children with unexplained hematemesis and anemia, particularly in endemic regions. Early recognition, prompt management, and preventive measures such as safe water practices and community awareness are essential to reduce morbidity and prevent recurrence.

Keywords: Leech, Severe Anemia, Hematemesis, Case report.

INTRODUCTION

Leeches are segmented worms belonging to the phylum Annelida and subclass Hirudinea. They are closely related to earthworms but have specialized adaptations that make them unique. Found in diverse environments, there are Aquatic leeches that thrive in freshwater lakes, rivers, and even marine environments, and errestrial (land) leeches that are typically found in tropical and subtropical regions, attaching to humans and animals that come into contact with vegetation [1,2].

Leeches can be classified based on their feeding behavior. Hematophagous leeches, like Hirudo medicinalis, attach to hosts such as humans to extract blood. In contrast, Predatory leeches, like

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Erpobdella octoculata, prey on small invertebrates such as worms. Lastly, Detritivorous leeches, like Acanthobdella peledina, consume decaying organic material [3].

Anatomically, leeches have 34 segments, though external rings create the appearance of additional segmentation. They possess two suckers: an anterior sucker, which helps with attachment and feeding, and a posterior sucker, which aids in locomotion. Unlike earthworms, they lack setae (bristles) and move in an inchworm-like fashion. Their specialized digestive system enables them to store blood for extended periods, allowing some species to go months without feeding [4–6].

The feeding mechanism of blood-feeding leeches is highly specialized. They create a Y-shaped incision in the host's skin using their jaws and secrete anesthetic compounds that make the bite painless. Their saliva contains hirudin to prevent clotting, vasodilators to enhance blood flow, and antimicrobial agents to reduce infection risk. Some leeches can consume up to ten times their body weight in blood, and their anticoagulants ensure that bleeding continues even after detachment [4,5].

Leeches have significant medical and economic importance. Medicinal leeches, particularly Hirudo medicinalis, have been used for centuries in hirudotherapy to treat various conditions. In modern medicine, they are utilized in reconstructive surgery to improve blood circulation and prevent venous congestion, and their anticoagulant properties help in managing blood clot disorders. Additionally, their saliva contains bioactive compounds that have anti-inflammatory and pain-relieving properties, making them useful in treating conditions like osteoarthritis and vascular diseases [6].

The majority of leech infestation cases have been found to be in children compared to adults. The common site of attachment is the nasopharyngeal area [3]. The clinical presentation of leech infestation depends on the exact site of the infestation. Hematemesis, epistaxis, vaginal bleeding, and signs of upper airway obstruction all may occur [3,6]. Although rare, serious, even lethal complications may arise, including lethal dyspnea, severe anemia, or hypovolemic shock [4,5]. Diagnosis may be made by indirect laryngoscopy or fiberoptic examination. Soft tissue radiograph of the neck may reveal a foreign body, but it is not specific for the leech [3,6,7].

CASE PRESENTATION

On 20th January 2025, we admitted a 4-year-old male patient from the rural part of Western Rwanda who presented with bright red bloody vomiting (hematemesis) about 2 to 4 times per day for 1 week. Associated with this, he had generalized body weakness, epigastric pain, low-grade fever, and headache. He had no history of other bleeding sites, like nasal bleeding or lower GI bleeding. He had loss of appetite but no bone pain or cervical/axillary swelling. He had no history of diarrhea or constipation. He had no history of cough or difficulty breathing. He had no history of leg swelling, dyspnea, or orthopnea.

The patient initially presented to a nearby health center, where he was prescribed omeprazole and paracetamol. Despite this, his symptoms worsened, with progression of hematemesis and generalized weakness. His vaccinations are up to date according to the Rwanda national immunization schedule. He is the youngest of seven children and lives with his single mother, a farmer. The family resides near a large irrigation dam, which is sometimes used as a source of water for cooking, drinking, and bathing. On exam, he was alert but prostrated. Vital signs: Oxygen saturation: 98%, Pulse rate: 160 beats per minute - full volume, Respiratory rate: 28 cycles per minute, Temperature: 38.1^{O}C, Weight: 18 kg, Height: 102 cm. Anthropometry: Normal, Head Eyes Ear Nose Throat (HEENT): Paper-white conjunctival pallor. Respiratory system: Symmetrical chest expansion, no subcostal or intercostal recession, clear lungs with bilateral equal air entry. Cardiovascular system: Warm extremities, bounding peripheral pulse, Capillary refill time < 2 seconds, No neck vein distention, Hyperactive precordium, Point of Maximum Impulse (PMI): 4th Intercostal space just medial to the left midclavicular line, Normal heart sounds. Musculoskeletal & Integumentary: Severe palmar & plantar pallor, no ecchymosis or petechiae. Central nervous system: Glasgow coma scale 15/15.

Initial laboratory investigations: Initial Full blood count result revealed severe microcytic anemia with; Hemoglobin: 3.8g/dl, Hematocrit: 11.9%, Red blood cell count: 1.64 (10^6/Mmol), Mean corpuscular volume: 72.5pg, mean corpuscular hemoglobin: 28pg, Mean cell hemoglobin concentration: 32.1g/dl, Platelets: 306 (10^3/

Mmol), White blood cell count: 11.2 (10^3/ Mmol), Neutrophils: 71.5%, Lymphocytes: 5.1%. C C-reactive protein: Positive (1/32). Other laboratory findings were unremarkable. At this point, the working diagnosis was Severe anemia secondary to Upper GI bleeding due to Peptic ulcer disease (PUD), or Sepsis.

The patient was transfused with packed red blood cells at 15 mL/kg, i.e, 270 mL over 3 hours. He was also given intravenous Ceftriaxone 900 mg bid, per os Paracetamol 250 mg tid, and per os Omeprazole 20mg od. After 10 hours of admission, he had another episode of hematemesis, and at this time, he vomited a live Leech worm, which measured about 10cm long (Figure 1).

Figure 1: The leech vomited by the patient

Subsequently, the patient was clinically stable and had no other episode of hematemesis or other sites of bleeding during the hospital stay. Full blood count control was done after a day, and the control laboratory findings were improved as listed in the table.

He was discharged after three days of inpatient treatment with oral antibiotics to complete 7 days and iron & folic acid for 1 month. Health education on danger signs and preventive measures was done before discharge. After 2 weeks, he came back for OPD follow up and he was well, no other episode of hematemesis reported, and normal physical exam findings.

This case report has been reviewed and approved by the Medical Ethics Committee of Kibuye Referral Hospital and Africa Health Sciences University. All patient information has been anonymized to protect confidentiality. No personal identifiers are included in this report.

DISCUSSION

Leech infestation cases (hirudiniasis) are relatively rare and sporadically reported, with limited comprehensive epidemiological data available. However, certain case reports and studies provide insight into the occurrence and impact of these infestations in specific regions. A study from Bangladesh documented 17 such cases in children aged 4.5 to 11 years over six years [8]. A number of individual cases have also been reported in African countries: Rwanda, Eritrea, Kenya, Tanzania, Congo, Ethiopia and Tunisia [4–7,9–11].

In Rwanda, this case represents only the third documented case. The first case is a 6-year-old girl from a rural area who presented with unexplained vaginal bleeding, found to be caused by a vulvar leech infestation. The leech was removed successfully, and the patient recovered without complications [12]. The second is a 5-year-old girl also from a rural area who presented with unexplained hematemesis, found to be caused by a leech infestation after she spontaneously vomited the worm, and the patient also recovered without complications [4].

Leech infestation occurs either through direct skin attachment or ingestion of contaminated water. In this case, the patient's history of swimming in and consuming water from an irrigation dam suggests ingestion, leading to upper gastrointestinal (GI) attachment. Similar reports from endemic regions, including Africa, the Middle East, and Southeast Asia, have documented infestations in the oropharynx, nasopharynx, larynx, and upper GI tract, with presentations ranging from mild throat discomfort to severe anemia and airway obstruction [7,9,12,13].

The nose is the most commonly reported site of infestation (71%), followed by the hypopharynx (14%), nasopharynx (7%), and oropharynx (7%), though involvement of the urethra, vagina, and rectum has also been described. Clinical manifestations depend on the site and may include recurrent epistaxis, dysphagia, dyspnea, anemia, hemoptysis, hematemesis, melena, airway obstruction, and voice changes [2].

Our patient presented with persistent hematemesis, fatigue, dizziness, and tachycardia, consistent with hemorrhagic anemia. Similar to other reports, the severity of bleeding can be attributed to the anticoagulant effects of leech saliva, particularly hirudin and other platelet inhibitors. A case in Iran

described massive hematemesis from a gastric leech in a child, while a report from Ethiopia detailed anemic shock from pharyngeal infestation, both highlighting the potential for life-threatening blood loss from a single parasite [3,10].

Although endoscopy remains the gold standard for diagnosis, suspicion should be raised in endemic areas once common causes of bleeding are excluded. In this case, the child's exposure to untreated water and constellation of symptoms allowed early recognition, underscoring the importance of thorough history-taking, particularly in resource-limited settings.

Management requires urgent intervention to halt blood loss and prevent complications such as airway obstruction, aspiration, or secondary infection. Endoscopic removal is the preferred approach for GI infestations, often supplemented by fluid resuscitation or blood transfusion in severe cases. Antibiotic coverage is recommended to prevent secondary infection from Aeromonas hydrophila, a bacterium associated with leeches. Pediatric cases have also reported successful use of sevoflurane-oxygen induction to immobilize the parasite before removal [7,11,14]. Removal should be performed carefully, as forceful extraction may leave mouthparts behind and prolong bleeding. Gentle detachment with blunt forceps or application of saline, vinegar, or alcohol is recommended; internal infestations typically require endoscopic extraction [2,5]. In this case, the patient was managed with a packed red blood cell transfusion (15 ml/kg), broad-spectrum antibiotics, and analgesics, and remained stable during follow-up with no further evidence of infestation.

This case highlights the importance of preventive measures in endemic regions, including boiling or filtering drinking water, discouraging swimming in untreated water, wearing protective clothing when in infested areas, and raising community awareness. Clinicians should maintain a high index of suspicion for leech infestation in children presenting with unexplained anemia and hematemesis, especially in regions where freshwater exposure is common. As this is a single case report, the observations should be interpreted with caution and cannot be generalized. Nonetheless, it highlights an important clinical scenario that may aid clinicians in similar settings.

This report has some limitations. First, as a single case report, the findings cannot be generalized to broader populations and only provide descriptive insight into a rare clinical presentation. Second, the diagnosis of leech infestation was made after spontaneous expulsion of the parasite, and no endoscopic evaluation was performed to confirm the exact site of attachment or to rule out additional lesions within the gastrointestinal tract. Third, microbiological or parasitological analysis of the leech was not conducted, limiting species identification and further understanding of potential pathogen transmission. Despite these limitations, the case provides important clinical insight into an uncommon but potentially life-threatening condition in resource-limited settings.

CONCLUSION

While leech infestations are rare, they can result in severe anemia and significant clinical consequences if not promptly diagnosed and managed. This case adds to the limited literature on leech-induced hematemesis in Rwanda and highlights the need for increased awareness, early recognition, and appropriate intervention in similar cases. Clinicians practicing in endemic and resource-limited settings should maintain a high index of suspicion for leech infestation in children presenting with unexplained anemia or upper gastrointestinal bleeding, particularly with a history of freshwater exposure. Public health efforts should emphasize preventive strategies such as ensuring access to safe drinking water, promoting water boiling or filtration, and educating communities about the risks of using untreated water sources. Further studies and surveillance are recommended to better understand the epidemiology, risk factors, and optimal management approaches for this condition.

Availability of data and materials

All relevant data supporting the findings of this case report are included within the article. Additional details (e.g., anonymized clinical records) are available from the corresponding author upon reasonable request, subject to institutional and ethical guidelines.

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