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Severe Acute Anaemia Secondary to Laryngopharyngeal Leech Infestation in a Three-Year-Old Child: A Case Report and Critical Review of the Literature from Rural Northern Tanzania

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Case Report

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Severe Acute Anaemia Secondary to Laryngopharyngeal Leech Infestation in a Three-Year-Old Child: A Case Report and Critical Review of the Literature from Rural Northern Tanzania

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Abstract

Background: Leech infestation of the upper aerodigestive tract is an uncommon but potentially life-threatening cause of mucosal bleeding and acute anaemia in children. Because symptoms may resemble gastrointestinal bleeding, epistaxis or a bleeding disorder, the diagnosis can be delayed, particularly in rural healthcare settings.

Case presentation: A three-year-old boy presented to Haydom Lutheran Hospital in rural northern Tanzania with a three-day history of vomiting blood and recurrent blood-stained saliva. His symptoms were preceded by epistaxis and accompanied by fatigue and reduced appetite. His father reported that the child had drunk water from a pond while playing. On examination, the child was markedly pale and tachycardic, with a heart rate of 150 beats/min and a temperature of 36.7°C. Blood-stained mucosa and a live leech were visible in the posterior pharynx. Laboratory investigation revealed severe anaemia, with a haemoglobin concentration of 4.1 g/dL. The platelet count was normal, and the reported coagulation assessment did not identify a clear alternative explanation for the bleeding. Direct laryngoscopy under general anaesthesia identified a leech attached in the left tonsillar/parapharyngeal region. It was removed under direct visualisation. Bleeding ceased following removal. The child received two units of blood, adjusted for age and weight, together with haematinic therapy. His haemoglobin increased to 9.9 g/dL by the third day after transfusion, and he was discharged in good clinical condition.

Discussion: This case illustrates the importance of considering upper aerodigestive leech infestation in children presenting with unexplained oral bleeding, apparent haematemesis and severe anaemia, particularly when there is exposure to untreated surface water. Direct visualisation and controlled extraction are central to management, while airway assessment, haemodynamic stabilisation and appropriate transfusion are essential components of care.

Conclusion: Laryngopharyngeal leech infestation should be considered in the differential diagnosis of acute severe anaemia and recurrent blood-stained saliva in children from rural settings. Early examination of the upper airway and timely removal may prevent continued blood loss and serious complications.

Keywords: Leech infestation; laryngopharyngeal; severe anaemia; child; blood-stained saliva; rural health; Tanzania.

1. Introduction

Leeches are blood-feeding annelids that inhabit freshwater and other moist environments. Human infestation, sometimes termed hirudiniasis, occurs when a leech attaches to a mucosal surface or other body site and feeds on blood. Although external leech attachment is usually readily recognised, infestation of the nasal cavity, pharynx, larynx or other parts of the aerodigestive tract can be diagnostically challenging. Such infestation is uncommon but may produce persistent bleeding, severe anaemia and, in some cases, airway obstruction or haemodynamic compromise [1–3].

Aquatic leeches may enter the upper aerodigestive tract when a person drinks untreated water or is exposed to contaminated freshwater during swimming or bathing. Children living in rural areas may be particularly vulnerable because of their contact with ponds, streams and other untreated water sources. However, exposure history alone does not establish the presence of a leech or identify the species involved [1,2,4].

Clinical manifestations depend on the site of attachment, duration of infestation, amount of blood lost and degree of airway involvement. Presentations described in the literature include epistaxis, haemoptysis, blood-stained saliva, apparent haematemesis, dysphagia, fatigue, pallor and severe anaemia. Laryngeal attachment may additionally cause stridor or acute upper airway obstruction [2,4–7]. In some children, the lesion may be mistaken for gastrointestinal bleeding or a primary haematological disorder.

Leech saliva contains biologically active substances that facilitate blood feeding, including anticoagulant activity associated with hirudin. Continued bleeding may occur after feeding because of impaired local clot formation. The contribution of salivary anticoagulants to clinically important haemorrhage is biologically plausible and consistent with the reported clinical presentations [1,8].

Published case reports have documented severe anaemia in children with pharyngeal or oropharyngeal leech infestation, including cases requiring transfusion and cases complicated by hypovolaemic shock or cardiac failure [3,6,9,10]. Other reports have highlighted the potential for laryngeal infestation to cause airway obstruction [4,5]. Despite these reports, recognition may remain difficult in settings where access to specialist airway assessment is limited.

We report a three-year-old boy who presented to a rural referral hospital in northern Tanzania with apparent haematemesis, recurrent blood-stained saliva and severe anaemia due to a live leech attached to the laryngopharyngeal region. This report highlights the diagnostic value of direct pharyngeal examination, the role of controlled endoscopic extraction and the management considerations relevant to resource-limited paediatric practice.

2. Case presentation

2.1 Presenting complaints and history

A three-year-old boy was brought to Haydom Lutheran Hospital, a rural hospital in northern Tanzania, with a three-day history of vomiting blood and recurrent episodes of blood-stained saliva. The symptoms were preceded by epistaxis. The child had also developed fatigue and reduced appetite.

According to his father, the child had drunk water from a pond while playing. This history raised the possibility of exposure to an aquatic organism, although the precise route of entry of the leech could not be established. The child had no reported fever. The available clinical history did not establish a previous bleeding disorder or another definite source of blood loss.

2.2 Clinical examination

On arrival, the child appeared markedly pale and tachycardic. His recorded temperature was 36.7°C, and his heart rate was 150 beats/min. Examination of the posterior pharynx revealed blood-stained mucosa and a visible live leech. (**Figure 1)**



Figure 1: Leech visualized on posterior pharynges

There was no accessible lymphadenopathy, hepatosplenomegaly, bruising or petechiae. These findings did not suggest an obvious systemic bleeding syndrome or a clinically apparent haematological malignancy, although the absence of these signs cannot independently exclude such conditions.

The presence of a live leech in the posterior pharynx, together with recurrent bleeding and severe anaemia, provided a strong clinical explanation for the presenting illness.

2.3 Laboratory investigations

Initial laboratory assessment revealed severe anaemia, with a haemoglobin concentration of 4.1 g/dL. The white blood cell count was mildly elevated, while the platelet count was normal. C-reactive protein was mildly elevated. Serum electrolytes were reported to be within normal limits.

The activated partial thromboplastin time was normal. Prothrombin time was reported as mildly prolonged. Stool microscopy was negative. The child's nutritional status was described as adequate in the clinical record.

The available results supported the presence of severe anaemia (**Figure 2**) but did not establish its duration or exclude pre-existing iron deficiency. No baseline haemoglobin measurement was available to determine whether the blood loss was entirely acute or occurred against a background of pre-existing anaemia.

All the clinical and laboratory findings are summarized in **Table 1**

Parameter	Normal range	Msr. Unit	22/08/2026 10577190 19:44 Hour	22/08/2026 10577191 19:44 Hour	22/08/2026 10577196 22:16 Hour	25/08/2026 10577457 09:35 Hour
ASAT	- - 42	U/L	6.98			
ALAT	- - 37	U/L	22.27			
CRP	0.01 - 5.00	mg/L			↑ 10.87	
Serum Sodium	135 - 145	mmol/L			136.49	
Serum Chloride	95 - 107	mmol/L			101.30	
Serum Potassium	3.4 - 5.1	mmol/L			4.26	
Haematology						
ABO grouping	-	N/A			O RH POSITIVE	
FBP	-			WBC=10.7H . RBC=1.54L . HGB=4.1L . HCT=11.9L . MCV=77.3 . MCH=27.1 . MCHC=35.1 . PLT=394 . LYM=3 . GRA%=62.9 . GRAN=6.7 . MID=1 . MID%=8.7 . MPV=7.8L . LPCR=11.6 . PCT=0.3 .		WBC=9.9 . RBC=3.42L . HGB=9.9L . HCT=27.8L . MCV=81.3 . MCH=29.1 . MCHC=35.7 . PLT=214 . LYM=4.4 . GRA%=51.1 . GRAN=5 . MID=0.5 . MID%=4.1 . MPV=8.5 . LPCR=18.1 . PCT=0.18 .
APTT	22 - 40	Sec			32.12	
PT	11 - 15	seconds			↑ 19.16	
INR	3.5 - 2.0	N/A			↓ 1.47	
Cross match	-				compatible	

***Figure 2**: above shows the blood Investigations which were done,*

Table 1. Summary of clinical and laboratory findings

Age and sex	Three-year-old boy
Symptom duration	Three days
Presenting symptoms	Apparent haematemesis, recurrent blood-stained saliva, preceding epistaxis, fatigue and reduced appetite
Exposure history	Reported pond-water ingestion
Temperature	36.7°C
Heart rate	150 beats/min
General examination	Marked pallor
Oropharyngeal examination	Blood-stained posterior pharyngeal mucosa with a visible live leech
Lymphadenopathy	No accessible lymphadenopathy
Hepatosplenomegaly	Not detected
Bruising or petechiae	Not detected
Haemoglobin	4.1 g/dL
White blood cell count	Mildly elevated
Platelet count	Normal
C-reactive protein	Mildly elevated
Activated partial thromboplastin time	Normal
Prothrombin time	Reported as mildly prolonged
Electrolytes	Reported within normal limits

Stool microscopy	Negative

2.4 Diagnosis and intervention

The working diagnosis was severe anaemia secondary to ongoing bleeding from a laryngopharyngeal leech infestation.

The child underwent direct laryngoscopy under general anaesthesia. Examination identified a live leech attached to the left tonsillar/parapharyngeal region, which was removed under direct visualisation. The leech was not taxonomically identified, (**figure 3 and 4**)



Figure 3 and Figure 4: The live leech after removal

Bleeding stopped following removal. The temporal relationship between extraction and cessation of bleeding strongly supports the leech as the principal identified source of haemorrhage.

2.5 Treatment and outcome

Following removal, the child received two units of blood adjusted for his age and weight, together with haematinic therapy. The exact body weight, blood product type, volume administered in mL/kg and transfusion rate should be retrieved from the treatment record for a complete account of the intervention.

By the third day after transfusion, the haemoglobin concentration had increased to 9.9 g/dL. The child was reported to be clinically improved and was discharged in good condition. Longer-term follow-up and subsequent haemoglobin measurements were not available.

3.Discusion and Critical review of the literature

3.1 Clinical spectrum of upper aerodigestive leech infestation

Upper aerodigestive leech infestation has been reported across a range of ages and clinical presentations. Symptoms are determined partly by the attachment site and may include epistaxis, oral bleeding, blood-

stained saliva, apparent haematemesis, dysphagia, fatigue and pallor. More severe presentations include profound anaemia, hypovolaemic shock and airway obstruction [2–7,9,10].

Shitaye and Shibabaw reported severe anaemia associated with pharyngeal leech infestation in Ethiopia, demonstrating the potential for a single retained leech to produce clinically important blood loss [3]. Getahun and colleagues also described severe anaemia in an infant with leech infestation, reinforcing the importance of recognising this unusual cause of paediatric blood loss [9].

More recent reports have continued to document severe presentations. A case report from Ethiopia described a two-year-old child with oropharyngeal leech infestation, severe anaemia and hypovolaemic shock [10]. Another report described heart failure associated with severe anaemia caused by oropharyngeal leech infestation, illustrating the potential cardiovascular consequences of profound anaemia [6].

In contrast, laryngeal attachment may present predominantly with respiratory symptoms. Arega and colleagues described laryngeal leech infestation as a cause of upper airway obstruction in children [4]. Woldemariam and colleagues subsequently reported a one-year-old child with laryngeal infestation and acute upper airway obstruction who recovered after direct laryngoscopic removal [5]. These cases emphasise that airway compromise and haemorrhage are distinct, potentially overlapping complications.

The present child had severe anaemia and recurrent bleeding without a documented episode of airway obstruction. The absence of recorded obstruction does not reduce the importance of airway assessment because the attachment site was close to the upper airway and could potentially have caused respiratory compromise.

3.2 Pathophysiology of bleeding and anaemia

Leeches attach to mucosal surfaces and feed on blood. Their saliva contains substances that facilitate attachment and feeding, including anticoagulant activity. Hirudin is a thrombin inhibitor that interferes with clot formation and is an important example of a leech-derived anticoagulant [8]. Continued oozing from the attachment site may therefore persist after the leech has fed or become partially detached.

The severity of anaemia depends on the duration of attachment, ongoing blood loss, the child's circulating blood volume and the presence of pre-existing nutritional or haematological vulnerability. Young children may develop substantial physiological consequences from blood loss because their circulating blood volume is relatively small.

In the present case, the haemoglobin concentration of 4.1 g/dL indicates profound anaemia. The visible leech, recurrent bleeding and cessation of bleeding after extraction support a causal relationship. Nevertheless,

because no baseline haemoglobin or iron studies were available, the contribution of pre-existing anaemia cannot be quantified.

3.3 Diagnostic challenges and differential diagnosis

Leech infestation may be missed when the initial presentation is interpreted as gastrointestinal bleeding, epistaxis or a primary coagulation disorder. Blood originating in the nasopharynx or oropharynx may be swallowed and subsequently vomited, creating the appearance of haematemesis. Blood-stained saliva may also be incorrectly attributed to oral trauma or mucosal inflammation.

The differential diagnosis in a child with severe anaemia and apparent haematemesis includes:

- Upper gastrointestinal bleeding, including oesophageal or gastric mucosal disease.
- Epistaxis with posterior drainage and swallowing of blood.
- Oral, pharyngeal or laryngeal trauma.
- Thrombocytopenia or an inherited or acquired coagulation disorder.
- Severe iron deficiency or another cause of pre-existing anaemia.
- Other foreign bodies or parasitic causes of mucosal bleeding.

A focused exposure history can be informative. Drinking untreated pond or stream water, swimming in freshwater and other relevant environmental exposures should be explored when appropriate. Such history should guide clinical suspicion but should not substitute for examination.

Inspection of the oral cavity and posterior pharynx is particularly important when blood-stained saliva, recurrent epistaxis or unexplained apparent haematemesis is present. When the suspected organism is not readily visible, or when attachment to the larynx or deeper pharynx is possible, endoscopic assessment may be necessary [3–5].

In the current case, visual identification of a live leech in the posterior pharynx and subsequent confirmation during direct laryngoscopy established the diagnosis. The negative stool microscopy did not contribute directly to confirming the leech infestation, but the result was consistent with the absence of an identified intestinal parasite on that examination.

3.4 Airway assessment and controlled removal

The first priority in suspected laryngopharyngeal leech infestation is assessment of airway patency and respiratory stability. Stridor, respiratory distress, voice change, drooling, inability to swallow, cyanosis or

reduced consciousness should prompt urgent airway evaluation. The absence of these features should be documented explicitly where assessed.

Removal should be performed with attention to the attachment site, the child's ability to cooperate and the risk of bleeding or airway compromise. Direct laryngoscopy may provide visual control when the organism is attached to the posterior pharynx, tonsillar region or larynx. Published paediatric cases describe successful extraction using direct laryngoscopy and appropriate instruments [4–6,10].

Blind traction or manipulation should be avoided when the attachment site is uncertain because it may cause mucosal injury, bleeding or incomplete removal. The method of extraction should be selected according to the location of the leech, the child's clinical status, available expertise and airway risk.

In this case, direct laryngoscopy under general anaesthesia allowed identification of the attachment site and controlled extraction. Bleeding ceased following removal, supporting the effectiveness of the intervention. The decision to use general anaesthesia should be understood in the context of this child's clinical circumstances; it should not be interpreted as a requirement for every leech infestation.

3.5 Management of severe anaemia

Management requires simultaneous attention to the cause of blood loss and its physiological consequences. In a child with profound anaemia, clinicians should assess haemodynamic stability, respiratory status, peripheral perfusion, mental status and evidence of cardiovascular compromise. Ongoing bleeding should be controlled promptly.

Blood transfusion may be required when anaemia is severe or accompanied by clinical instability. The decision, blood product, dose, rate and monitoring should be individualised according to the child's condition and applicable paediatric transfusion guidance. The underlying source of bleeding must be treated because transfusion alone does not prevent continued blood loss.

Iron or other haematinic therapy may be appropriate when iron deficiency or depleted iron stores are suspected or confirmed. However, haematinic therapy is not a substitute for stabilisation and transfusion when these are clinically indicated. Follow-up assessment should include clinical recovery and repeat haemoglobin measurement, with additional investigations guided by the suspected cause and response to treatment.

The child in this report received two units of blood and haematinic therapy after removal of the leech. His haemoglobin increased from 4.1 g/dL to 9.9 g/dL by day three. This rise documents the observed laboratory response, but the absence of a recorded body weight, transfusion volume in mL/kg, blood product details and transfusion timing limits independent evaluation of the transfusion regimen.

3.6 Relevance to rural and resource-limited settings

Leech infestation is an important diagnostic consideration in rural environments where children may be exposed to untreated freshwater. Similar cases have been reported from several countries, including Ethiopia, where rural water exposure and delayed recognition have featured in published reports [3–5,9,10].

The present report adds a case from northern Tanzania and illustrates a practical diagnostic lesson: unexplained oral bleeding and severe anaemia should prompt careful inspection of the upper aerodigestive tract, especially when a relevant environmental exposure is reported.

Prevention depends on access to safe drinking water, avoidance of untreated surface water and community education. These measures are biologically plausible and consistent with the exposure patterns described in published reports, although this individual case cannot quantify the effectiveness of any specific prevention intervention.

At the facility level, clinical pathways for paediatric bleeding should include an airway assessment, examination of the oral cavity and pharynx, urgent haemoglobin measurement when available, and early involvement of clinicians capable of managing an airway foreign body. Referral or transfer planning should account for the possibility of sudden airway compromise and the need for controlled extraction.

3.7 Comparison with previously reported cases

The present case shares several features with published paediatric reports: young age, rural freshwater exposure, mucosal bleeding, severe anaemia and improvement after removal of the leech [3–5,9,10]. However, individual reports differ in attachment site, severity, presence of respiratory compromise and the treatment required.

Reports of laryngeal infestation highlight airway obstruction as a major complication [4,5], while reports of oropharyngeal infestation have described severe anaemia, hypovolaemic shock and cardiac complications [6,10]. These presentations demonstrate that clinical severity cannot be inferred from the apparent size of the organism or the initial amount of visible bleeding alone.

In the present case, severe anaemia was the dominant documented complication. No taxonomic identification of the leech was performed, and the available record does not establish the exact duration of attachment. The report therefore supports recognition of the clinical syndrome rather than conclusions about species-specific behaviour or the precise quantity of blood lost.

4. Strengths and limitations

This report has several strengths. First, a live leech was directly observed in the posterior pharynx and its attachment site was confirmed during laryngoscopy. Second, severe anaemia was documented objectively by haemoglobin measurement. Third, bleeding stopped after extraction, providing a strong temporal link between removal and clinical improvement.

Several limitations should be acknowledged. First, this report describes a single patient and therefore cannot establish the prevalence of leech infestation or compare the effectiveness of different management strategies. Second, the leech was not taxonomically identified, and the duration of attachment and volume of blood loss could not be determined. In addition, because of limitations in the available laryngoscopy equipment, no intraluminal images were obtained to document the leech's attachment site during the procedure. Third, baseline haemoglobin measurements and iron studies were unavailable, preventing assessment of whether pre-existing anaemia contributed to the severity of the presentation. Finally, long-term follow-up was not available to assess sustained haematological recovery or the risk of recurrence.

The literature review is narrative rather than systematic. It does not claim to have identified every published case, and publication bias is likely because unusual or severe cases are more likely to be reported. The review should therefore be interpreted as a critical synthesis of selected relevant literature rather than an estimate of incidence or comparative treatment effectiveness.

5. Conclusion

Laryngopharyngeal leech infestation is an uncommon but potentially serious cause of mucosal bleeding and severe anaemia in children. In rural settings, a history of untreated freshwater exposure combined with epistaxis, blood-stained saliva or apparent haematemesis should prompt careful examination of the upper aerodigestive tract.

This case demonstrates that direct visualisation and controlled extraction can identify and remove the source of bleeding, while appropriate management of severe anaemia supports recovery. Early airway assessment, prompt source control and individualised supportive care are essential. Improved access to safe water and clinical awareness may help prevent delays in diagnosis.

Declarations

Ethics approval:

Formal ethical approval was not obtained for this case report. The report describes the clinical presentation, investigation, management, and outcome of a single patient and does not involve a research intervention.

The authors acknowledge that the requirement for ethics committee review or exemption is determined by the applicable institutional policies and the requirements of the target journal. The authors will seek confirmation from the relevant institutional authority if required.

Consent for publication: Verbal informed consent for publication of the clinical details was obtained from the child's parent. Written consent was not obtained. The authors acknowledge that the adequacy of verbal consent must be assessed against the requirements of the target journal and applicable institutional policies**.**

Availability of data and materials: The clinical information supporting this case report is contained in the manuscript. Additional information should be shared only where permitted by institutional policy and consent arrangements.

Competing interests: The authors declare that they have no competing interests.

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Author contributions: Matei Mselle and Ombeni Fikeni Twazihirwa conceptualised the case report and developed the initial manuscript. The other authors contributed their clinical expertise through critical review of the manuscript, providing professional insights and recommendations to improve its clinical accuracy and scientific quality. All authors reviewed and approved the final version of the manuscript and agree to be accountable for their respective contributions.

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Clinical trial number: not applicable.

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