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Clinical Case Reports

A Leech in the Upper Tract of a Shepherd: Case Report and Review of Literature

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Abstract:

Leeches are segmented, sanguinivorous annelids, they are water-living, blood-sucking parasites of various colors and lengths. *Hirudo medicinalis* is the most reported species, more than 121 cases were described since 1962 in Algeria. The most common infection source is the consumption of contaminated water either by voluntarily ingestion or unintentionally, during swimming in contaminated water in rural areas.

A 50-year-old male without any particular background, shepherd by profession drank water from a nearby source of his village.

Two months later the patient consulted for a sore throat, becoming more and more marked, leading to dyspnea.

After examination, the leech was successfully grasped and removed with foreign body forceps with a full length of more than 7,5 cm.

This case highlights the importance of considering leech infestation in shepherds living in rural areas. A high index of suspicion allows for early diagnosis and prompt treatment, preventing potential complications.

Keywords: Leech; Hirudo medicinalis; hemoptysis, sore throat, dyspnea, parasites

Introduction:

Leech are hermaphroditic parasites of phylum Annelida and class Hirudinea [1], which are blood feeding ectoparasites of humans[2]. These specimens live on occasional blood sucking by attaching to fish, amphibians, and mammals [3].

There are over 650 species but only the minority of these are sanguinivorous and the cause of human morbidity. Historically, leeches have been used for medicinal purposes with the earliest recorded being 1500 BC. Their body surface is slippery because of a wide distribution of slime glands [4].

The saliva of the leech contains Hirudin which inhibits thrombin in the clotting process. It also has local anaesthetic properties. Consequently, the wound caused by the leech is painless [5,6,7].

Infestation usually occurs by drinking infested water or bathing in stagnant streams, pools or springs which are infested with leeches [2].

A leech can suck out as much blood as ten times its own weight, the host does not feel pain due to the leech saliva containing vasodilators and hirudin [8]. An adult leech can ingest 1 milliliter per minute of blood, and the area of attachment can bleed for 10 hours to as long as 7 days in some instances.

Leeches are used intentionally in reconstructive surgery where a flap or replanted digit has developed venous congestion. The leeches drain the excess venous blood, increasing the chances of survival of the flap or replant [9,10,11].

Leech can occur at different sites in humans commonly in the eyes, nasopharynx, larynx, urethra, and vagina and rarely in the rectum [2].

As the organism grows in size, it may cause various symptoms, depending on its anatomic location. These symptoms include nosebleeds, hemoptysis, a foreign body sensation, and coughing. Leech can induce a foreign body sensation, epistaxis, hemoptysis [12], and they are considered as the very rare cause of airway foreign body around the world [3].

Laryngeal examination and early removal of the leech is essential [13].

After leech removal parts of its mouth may remain behind, leading to continuation of bleeding and secondary infection [14].

Leeches are rare cause of ENT symptoms especially in at-risk patients from rural settings [12].

Case report:

A 50-year-old male living near the town of El-Bayad in a village commonly called "Mechria sghira" without any particular background, shepherd by profession, consulted initially for a sore throat. He claimed having drunk from a nearby source of his village where he regularly taking care of his sheep. The patient confessed that even the animals were drinking from the same water source.

Two months later our patient consulted again and was treated as seasonal tonsillitis, after finishing his treatment the discomfort became more and more marked until one evening when he woke up in the middle of the night with dyspnea, He was urgently transferred to the CHU Sidi Bel Abbes ENT service level, for extraction of a foreign body.

Physical examination revealed that he was underweight. Additionally, he had severely pale conjunctivae. He had no bleeding and no previous similar episode.

Laboratory investigations showed WBC=12,39 103/mm3, Neutrophil=75,6%, Lymphocyte =10,9%, RBC= 3,37 106/mm3, HB=10,1 g/dL, Hematocrit =29,8%, Platelet = 226 103/mm3.

Urea=0,44 g/L, Crea=6,71 mg/L, TP=100%, TQ=13,1 s, INR=1, TCA=22,3%.

After fibrscopy foreign body between the vocal folds was identified. The removal of the parasite was impossible so local anesthesia was instaured using xylocaine in order to paralyze the parasite. The leech was successfully grasped and removed with foreign body forceps with a full length of more than 7,5 cm.

The parasite was brought to the parasitology and medical mycology department of the CHU Sidi-Bel-Abbes and identified as the medicinal leech *Hirudo medicinalis.* (Figure 1)

The patient had an uneventful post-extraction period and was discharged rapidly with therapeutic dose of iron sulphate.

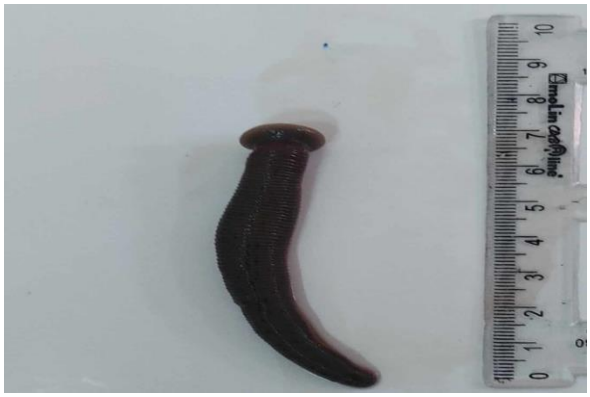

Figure 1. Macroscopy showing a slender leaf shaped removed from the larynx of the patient

Discussion:

Leech epidemiology

Leaches can vary from 2 to 15 cm in length with an average length of 4,6 cm. A leech has two suckers, one at each end. The mouth lies within the anterior sucker, and has the ability of adhering and piercing the host's mucosa [15]. Blood-sucking species have jaws in the anterior sucker that contain chitinous teeth for biting. Hemophagic species engorge and darken during blood sucking [16,17,18, 10] sucking 8 times their own body weight [3,15], they can induce bleeding and severe anemia [19].

Leeches are organisms that can be found in both aquatic and terrestrial environments [12]. Interestingly, a 4-year-old girl in south-west Germany was contaminated with *Theromyzon tessulatum* a duck's leech [20].

However, leech mainly live in fresh water and are segmented, hermaphrodite, carnivorous worms. They are sensitive to vibrations on the water, touch, light, heat, sound, and various chemicals. The leech dries out quickly and that is why it is highly associated with water [2].

Several anticoagulant compounds are transmitted through leech bite. These substances include bufrudin, hirudin, theromin, haemadin and granulin-like peptide [21].

The salivary glands of leeches emit many biologically active substances with anticoagulant, thrombin regulatory, anti-inflammatory, analgesic, platelet inhibitory, extracellular matrix degradative, and antimicrobial properties. Leeches are capable to secrete an anticoagulant (hirudin) to help them obtain a full meal of blood. Hirudin in leech saliva can inhibits thrombin, factor IXa and hementerin, a plasminogen activator [22].

Leech should be considered in places with poor access to water [12,23], where drinking water from the streams and ponds is a habit [15,23]. Leech infestation has been reported in many rural setting, in Taiwan [16], Pakistan [23], Morocco [24,25], Ethiopia [26,15], Yemen [8], India [27], Turkey [19,28], Greece [29], and Spain [30].

Human contamination by leech is extremely rare in urban areas [31].

Aquatic leeches are common in Algeria where two species have been described *Hirudo medicinalis* and *Limnatis nilotica* [32]. In Algeria, leech infestation is not uncommon where 120 cases were described between 1962 and 1971 by Gerlach [32].

The association between patient's unsafe water drinking habits and leech infestation in ENT region was statistically proved [23,12].

Leech contamination

The age distribution of the infected patients is ranged from 17 months to 73 years [32,24,33,29], male patients are more affected than female.

Leech is common in marshy areas or through slow-moving brooks. Leeches usually infest the body surface of human host. They rarely enter through the orifices [4]. Leech gets access to the human body either by drinking or bathing with the infested water [15,29,3]. Since the mode of contamination is more likely drinking than swimming [32], drinking water from natural springs is incriminated [19,33,28].

Nasal leech infestation is almost exclusively documented from the developing nations in the tropics [34]. Attention should be given to nasal leech infestation, especially in children and senior citizens who have visited rural streams and have been exposed to freshwater [16,13].

So far, two case reports of pediatric and one adult patient were diagnosed with rectal leech infestation [35,31,2].

Once the leech attaches to the skin or mucosal surface using its anterior sucker, it uses its saliva to anaesthetize the area of its attachment [10,36].

Adult's leech localization

Leeches occasionally enter the human orifices such as the eyes, nasopharynx [16], urethra [4,37,5,6], vagina [38,22,37,5,6], and rarely the rectum [39,22,37,5,6], causing mucosal, orifical, vesical or internal hirudiniasis depending on the localization of the leech [2]. Surprisingly, a leech was recovered in the large bowel [40].

ENT localizations

Leeches in otolaryngology practice have been reported commonly in the oral cavity [41], the nose [34,

[36,42-47], followed by the pharynx [47-49], nasopharynx [36,50,51], oropharynx 42,28, hypopharynx 48,52, and rarely in the larynx [36,8,42,53,29,26], or even in the trachea [54,55]. Additionally, leech have been identified in the supraglottic region of the larynx [56]. Examples of leech contaminating the larynx are depicted in table 1.

A retrospective study about leech infestation in Pakistan, revealed that the nose is the most common ENT site of leech infestation (71%) with unilateral epistaxis being the most prominent symptom [46]. Other sites included hypopharynx (14%), nasopharynx (7 %) and oropharynx (7 %) [23].

Air way obstruction especially in rural areas where drinking water from the streams and ponds is common. Leeches can attach to the mucosa of the entire upper aerodigestive tract but a leech stuck in the larynx is rarely seen. So far, there are only a few reports of living leeches stuck in the larynx causing upper air way obstruction and hemoptysis [27,48,23].

Clinical signs

Medical literature includes reports of live foreign bodies in the airways. Fish, leeches, and roundworms are the most common live foreign bodies of the lower airways [57,58-60].

leech is an unusual cause of respiratory distress [27,13]. Moreover, epistaxis or any other related symptom must be taken with suspicion in leech endemic area [23]. Furthermore, dysphagia, and spitting of blood are also reported [13].

The major ENT clinical signs include foreign body sensation in the throat [36], voice hoarseness [29,13], dysphonia [13,32], inspiratory stridor [4], coughing [25], hemoptysis [53,25], dysphagia, and sometimes cause airway obstruction [54], depending on the site.

Sudden onset of otorrhagia or otalgia with no history of ear disease and sense of moving object in the ear canal can lead us to a living foreign body in the external ear [22]; it can be diagnosed and treated by exact inspection and removal [61,22]. motile foreign body sensation and active bleeding from the ear are symptoms of alive foreign body [22].

Leech inhalation should be considered among the differential diagnosis of stridor and hemoptysis where drinking spring water is a habit. Any delay of diagnostic can lead to lethal complications such as severe anemia and suffocation [32].

Differential diagnosis

The symptoms may be misdiagnosed as asthma, laryngitis, tuberculosis, hookworm and malignancies [53].

In case of epistaxis, the common causes for unilateral nasal bleeding in adults are benign or malignant tumors and deviated nasal septum. Recurrent unilateral nasal bleeding due to leech infestation was described in Nepal [62].

The others rare clinical signs

Leech in urinary bladder is very rare causing hematuria [37,4], and urinary retention [4], patients usually present with severe pain in the penis, together with dysuria and frank hematuria [37,5,6,7]. Diagnosis of such cases are usually difficult unless the patient remembers the leech when it enters the orifice [7].

Moreover, severe rectal bleeding due to leech bite was reported in India. Leech in rectum presents with painless rectal bleeding, anorectal discomfort, crawling sensation in perianal area and tenesmus [35,31,2].

Complication of leech presence

Reportedly, leech-bites induce severe anemia requiring iron supplementation [42]. Fatal anemia-related complications were reported in Kenya [49]. Moreover, severe anemia of 3mg/dl was described [63]. Some authors report complications of anemia following leech bites bad enough to require iron supplementation. In Bangladesh, fifteen cases presented with bleeding and transfusion was required in five cases with Hb% <7 gm/dl [39,19]. Leech-resident *Aeromonas hydrophila* bacteria have been reported to cause wound infection [10]. Their digestive tract contains several bacterial species, the main ones being *Aeromonas hydrophila* and *Aeromonas veronii biovar sobria*, which contribute to the digestion of ingested blood [64].

Aeromonas species account for 88% of leech-associated infections, but recent reports of several other pathogens, including *Serratia marcescens*, *Vibrio fluvialis*, various viruses, and emerging multidrug-resistant organisms, have increased the risk profile of leech therapy [65,66].

Leech's infestation treatment

Extraction is imperative and should be performed as soon as the diagnosis is made to avoid a fatal progression [25]. The leech can be removed by saline irrigation or extraction by forceps without requiring any surgical procedure [38,31]. Removing leech with forceps is difficult because it has a soft and slippery skin, which ruptures easily [2]. We have to consider that pressing the organism at the midpoint of its body for 5 to 20 seconds using forceps will cause the organism to detach from the mucosa and aid extraction [36].

Lidocaine 4% was reported to cause immobility of the leech in the eye, and glycerine phenice cause immobility of the leech if poured in the ear [61].

Leeches in the nose and oropharynx may not necessarily require general anesthesia, but those in the larynx and trachea typically need [44]. It can also be removed under local anesthesia by gently grasping with the help of a long clamp [19].

Cystoscopic removal can be a useful technique for the removal of leeches from the urinary tract when saline irrigation fails [67]. Catheterization and irrigation of the urinary bladder with normal saline is a relatively simple, safe and inexpensive method of removing the leech and controlling hematuria [5,7,37].

The leech adhered to the larynx was grasped cautiously with laryngeal forceps and the leech removed alive [15].

Table 1. Examples of some reported cases of larynx's leech

Age/Gender	History	Leech lengh (cm)	Signs	Contamination	country	Author
12/M	8 days	-	Cough Moderate hemoptysis	Drinking	Morocco	[25]
7/M 26/M	-	-	Cyanosis Breathing difficulty Dyspgagia Spitting blood	-	Jordan	[13]
12/M	-	-	Respiratory distress Hemoptysis	Drinking	Ethiopia	[26]
73/M	3 weeks	-	Dysphagia hemoptysis dyspnea stridor	Drinking	Iran	[33]
62/M	7 days	-	Hemoptysis Hoarseness	-	Greece	[29]
9/M	-	-	shortness of breathing cough spitting blood	Drinking	Ethiopia	[15]
7/M	14 days	6	Dyspnea Spitting blood	Drinking	Ethiopia	[54]
64/M	-	-	Hemoptysis Aphonia	-	Algeria	[32]

			throat's foreign body			
17 month /M	7 days	5	Dyspnea caugh Anemia	Swimming	Morocco	[24]
34/M	7 days	5	Foreign body Hemoptysis Dysphagia Dyspnea	Drinking	Spain	[30]
5/F	3 days	3,7	Epistaxis vomiting anemia	Drinking	Turkey	[68]
8/F	-	5	Hemoptysis Fever	Drinking	Turkey	[69]
7/M	4 days	3	Dysphagia Hemoptysis	-	Turkey	[28]
33/M	-		Dyspnea Hemoptysis	-	Turkey	[19]
64/M	-	5,5	Hemoptysis Dysphonia Foreign body	Drinking	Iran	[70]
60/M	30 days	5,5	Hoarseness Stained sputum Hemoptysis	Drinking	Yemen	[8]
48/M	3 hours	5	Cyanosis Breathlesness Stridor	Drinking	India	[27]
6/M	3 hours	7	Hemoptysis Cough Stridor	Drinking	Syria	[53]

Conclusion:

Leeches endoparasitism should be included in the differential diagnosis of patients with hemoptysis, signs of discomfort and airways obstruction. This rare parasitic disease should be considered in places with poor access to water, with history of contact with unfiltered water where aquatic leeches are commonly found.

The important consideration in handling this cases are good history-taking and physical examination to determine the infestation.

Thus, prevention should be a priority for sheep farmers, who should never consume questionable or unfiltered water in rural areas.

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