

Cutaneous complications of improper leech application

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Abstract

Introduction: The medical leech (*Hirudo medicinalis*) has been used throughout the centuries and continues to be used today, mainly in reconstructive surgery and microsurgery. Easy access to these animals may entail an improper use of this therapeutic method by patients as a form of self-treatment.

Case report: A man who presented with skin erythema and oedema due to the application of a medical leech.

Discussion: Infection is considered the most common complication of hirudotherapy, even though bacteriological examination of leech applied by the patient showed neither bacterial nor parasitic infection. The skin lesions were probably of allergic origin; whether this reaction was due to substances released from the leech or as a consequence of reusing the same leech, remains to be determined.

Key words

medical leech, hirudotherapy, complications, erythema, cryotherapy

INTRODUCTION

The medical leech (*Hirudo medicinalis*) has been used throughout the centuries by physicians as a remedy for a broad spectrum of medical conditions, and has recently been rediscovered for the treatment of specific diseases. Leeches continue to be used today, mainly in reconstructive surgery and microsurgery [1, 2]. Recently, hirudotherapy has been attracting the attention of medical professionals, and is also commonly used as a form of self-treatment among many farmers in our district. The key molecule of this form of therapy is hirudin, a potent anticoagulant that specifically inhibits thrombin and platelet aggregation. The release of hirudin, an anti-hemostyptic agent, together with effective sucking of venous blood and subsequent spontaneous bleeding, are considered to be the responsible therapeutic mechanisms. *Hirudo medicinalis* also excretes other pharmacologically active substances, such as hyaluronidase and protease inhibitors, which promote spreading of the anticoagulant in a wound. It is thought that the release of an additional vasodilator leads to an increase of bleeding time after the end of the blood meal of the leech [3, 4, 5].

Some case reports and laboratory studies have suggested free-living leeches as potential vectors for bacterial, viral, and parasitic diseases, including hepatitis B, HIV, syphilis and toxoplasmosis, although the risk of transmission to humans is considered negligible [2, 6, 7, 8]. The possibility of medical leeches acting as vectors of infectious agents

justifies the recommendation of not sharing them between patients. There are some additional reasons forbidding the repetitive use of leeches, even by the same patient. Following one application to the patient, the leech cannot suck blood for some weeks and has to be kept until the next blood meal. This situation favours the development of infectious agents in the animal's intestine, including infection with *Aeromonas hydrophila* [9, 10]. Wide access to leeches may favour an improper use of this therapeutic method by patients as a form of self-treatment. The presented study report the case of a patient who presented with cutaneous problems after self-application of a medical leech.

CASE REPORT

A 50-year-old Caucasian male consulted our Dermatology Department for cutaneous lesions that had appeared the previous day. Two months earlier, he had applied a leech for 40 minutes for self-treating an episode of acute pharyngitis. The treatment was successful and the patient kept the animal in a container with water. After two months, he used the leech again for the self-treatment of intercostal pain, again leaving the animal on the skin for 40 minutes. Soon after this application, he felt pain, a burning sensation and pruritus. On admission, the patient presented with a large erythematous and oedematous skin lesion with ill-defined borders (Fig. 1). The center of the erythematous lesion was indurated with three red erosions corresponding to the site of the leech bite. Physical examination revealed slightly painful axillary lymph node enlargement (up to 2 cm). The patient had no fever.

Routine laboratory tests were within normal limits, with the exception of IgE that were increased two-fold above the

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Figure 1. Lesions of the intercostal region secondary to hirudotherapy



Figure 2. Skin ultrasound showing oedema of subcutaneous tissue

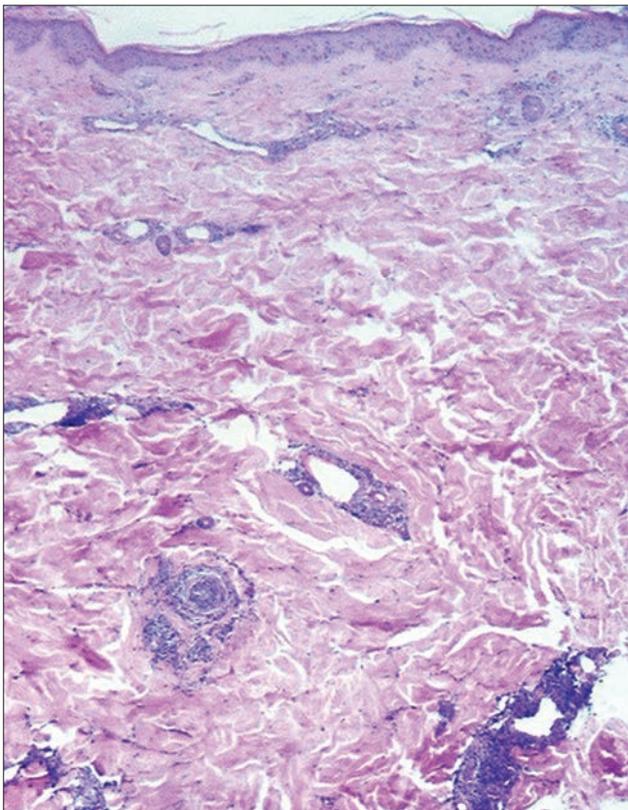


Figure 3a. Histological findings of skin biopsy (hematoxylin-eosin stain)

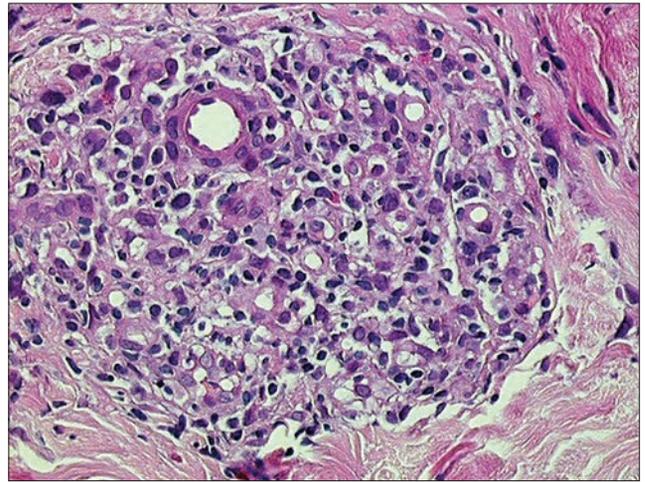


Figure 3b. Histological findings of skin biopsy (hematoxylin-eosin stain)

upper normal limit. Skin ultrasonography revealed oedema of the subcutis (Fig. 2). Histopathologic examination of a skin biopsy showed slight epidermal acanthosis and dilated blood and lymphatic vessels in the dermis; the latter contained also a moderately dense inflammatory infiltrate consisting predominantly of lymphocytes, with some eosinophils forming perivascular and occasionally perifollicular nodules (Fig. 3a, 3b).

The patient was treated with oral antibiotics (ciprofloxacin), antihistamines (clemastine, fexofenadine), vasculoprotective drugs (rutin, aescin, diosmin and sulodexide), and topical steroid ointment. A 5-day course of cryotherapy was also started, leading to regression of the lesion, with the exception of the erosions (Fig. 4). Four weeks later, the patient still



Figure 4. Skin appearance after successful combined pharmacologic therapy and cryotherapy

presented an infiltrated lesion of 3 cm diameter; cryotherapy was applied once again. As superinfection was suspected, the leech was subjected to bacteriological examination which showed neither bacterial nor parasitic infestation (Fig. 5).

DISCUSSION

Complications of hirudotherapy are considered to be rare and usually related to scarring and local bacterial infection [11], the most serious one being that due to *Aeromonas*

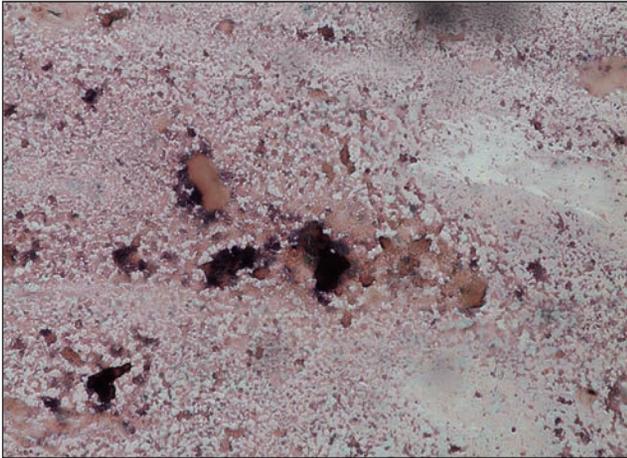


Figure 5. Microscopic slides were stained with the Harris method for the presence of protozoa

hydrophila. This microorganism is present in the intestinal flora of the leech and can cause wound infection, and in the most severe cases even sepsis [12]. With the prophylactic use of antibiotics, as recommended in the literature, this complication can be avoided [13]. There are only anecdotal reports in the literature of relevant anaemia [13, 14], usually due to multiple applications of leeches, and one report of prolonged bleeding time of up to 2 days [1]. Since the patient did not develop any reaction after the first leech application, it is speculated that the skin lesions after the second application were of allergic origin, consistent with a possible sensitization of the patient to some leech secretion during the first application. Both irritant and allergic contact dermatitis have been rarely reported [15, 16, 17, 18]. Interestingly, in another patient, the diagnosis of contact dermatitis caused by an extract of *Hirudo medicinalis* was confirmed by patch testing, however, these tests performed with recombinant analogues of hirudine were negative [17]. This observation underlines the difficulties in identifying a potential causative agent from salivary gland secretion of medicinal leeches. Although hirudin is the best known substance produced by leeches, proteomic analysis has revealed that their saliva contains more than 100 proteins with molecular weight ranging from 10 – 97 kD [19]. Moreover, the composition of proteins contained in the salivary gland secretion not only shows seasonal variations, but even doses of the secretion injected to the wound during the time of blood sucking vary [19]. Within this group, only few have been identified and their biological activity described [19]. Unexpectedly, in the context of such intense inflammatory reaction that occurred in the patient in the presented study, besides hirudin – a potent anticoagulant – most of these substances also possess strong anti-inflammatory and even anaesthetic properties [19, 20].

REFERENCES

- Riede F, Koenen W, Goerdts S, Ehmke H, Faulhaber J. Medicinal leeches for the treatment of venous congestion and hematoma after plastic reconstructive surgery. *JDDG* 2010; 8: 881-888.
- Wells MD, Manktelow RT, Boyd JB, Bowen V. The medical leech: an old treatment revisited. *Microsurgery* 1993; 14: 183-186.
- Haycox CL, Odland PB, Coltrera MD, Raugi GJ. Indications and complications of medicinal leech therapy. *J Am Acad Dermatol.* 1995; 33: 1053-1055.
- Vera C, Blu A, Torres M. Leeches, today and yesterday present parasites. *Rev Chil Infectol.* 2005; 22: 32-37.
- Wallis RB. Hirudins and the role of thrombin: lessons from leeches. *Trends Pharm Sci.* 1988; 9: 425-427.
- Narendranathan M. Leeches and hepatitis B. *Lancet* 1992; 339: 1362.
- Nehili M, Ilk C, Mehlhorn H, Ruhnau K, Dick W, Njayou M. Experiments on the possible role of leeches as vectors of animal and human pathogens: a light and electron microscopy study. *Parasitol Res.* 1994; 80: 277-290.
- White GB. Leeches and leech infestations. In: Cook GC, Zumla AI, eds. *Manson's tropical diseases.* 21st edn. London: Saunders; 2002, 599-600.
- Bickel K, Lineaweaver W, Follansbee S, Feibel R, Jackson R, Buncke H. Intestinal flora of the medicinal leech *Hirudinaria manillensis*. *J Reconstr Microsurg.* 1994;10:83-5.
- Sartor C, Limouzin-Perotti F, Legre R, Casanova D, Bongrand MC, Sambuc R, Drancourt M. Nosocomial infections with *Aeromonas hydrophila* from leeches. *Clin Infect Dis.* 2002; 35: e1-e5.
- Heukelbach J, Hengge Ulrich R. Bed bugs, leeches and hookworm larvae in the skin. *Clin Dermatol.* 2009; 27: 285-290.
- Ardehali B, Hand K, Nduka C, Holmes, A, Wood S. Delayed leech-borne infection with *Aeromonas hydrophila* in escharotic flap wound. *J Plast Reconstr Aesthet Surg.* 2006; 59: 94-95.
- Whitaker IS, Kanya C, Azzopardi E, Graf J, Kon M, Lineaweaver WC. Preventing infective complications following leech therapy: is practice keeping pace with current research? *Microsurgery* 2009; 29: 619-625.
- Haycox CL, Odland PB, Coltrera MD, Raugi GJ. Indications and complications of medicinal leech therapy. *J Am Acad Dermatol.* 1995; 33: 1053-1055.
- Klimanińska M, Żmudzińska M, Jenerowicz, D Czarnecka-Operacz M. The importance of exposure to contact allergens in patients with allergic contact dermatitis. *Post Dermatol Alergol.* 2011; 3: 203-211.
- Karadag AS, Calka O, Akdeniz N, Cecen I. A case of irritant contact dermatitis with leech. *Cutan Ocul Toxicol.* 2011; 30(3): 234-5.
- Blaise S, Le Brun V, Sparsa A, Delrous JL, Bonnetblanc JM. [Contact dermatitis with *Hirudo medicinalis*]. *Ann Dermatol Venerol.* 2002 ;129(12): 1380-2.
- Dejobert Y, Martin P, Thomas P, Bergoend H. Contact dermatitis from topical leech extract. *Contact Dermatit.* 1991; 24(5): 366-7.
- Baskova IP, Kostrjukova ES, Vlasova MA, Kharitonova OV, Levitskiy SA, Zavalova LL, Moshkovskii SA, Lazarev VN. Proteins and peptides of the salivary gland secretion of medicinal leeches *Hirudo verbana*, *H. medicinalis*, and *H. orientalis*. *Biochemistry (Mosc).* 2008; 73(3): 315-20.
- Porshinsky BS, Saha S, Grossman MD, Beery II P, Stawicki S. Clinical uses of the medicinal leech: A practical review. *J Postgrad Med.* 2011; 57: 65-71.