



### Hemorrhagic Shock Due to Hirudotherapy Made with Uncontrolled Multiple Leech Bites

Kontrolsüz Çoklu Sülük Isırması ile Yapılan Hirudoterapiye Bağlı Hemorajik Şok

Mustafa Yılmaz<sup>1</sup>, Mehmet Oğuzhan Ay<sup>2</sup>, Mesude Atlı<sup>1</sup>, Ali Arıkan<sup>3</sup>

<sup>1</sup>Necip Fazil State Hospital, Emergency Medicine Service and <sup>3</sup>Cardiovascular Surgery Service, KAHRAMANMARAŞ

<sup>2</sup>Adana Numune Education and Research Hospital, Department of Emergency Medicine, ADANA

*Cukurova Medical Journal 2014;39(1):147-151.*

#### ABSTRACT

Hirudotherapy is a alternative treatment method using leeches. It is especially used for the treatment of pain, sialadenitis, osteoarthritis and venous insufficiency. Hirudin which is one of the secreted substances of leeches prevents blood coagulation and causes bleeding. In this paper, we aimed to draw attention to the unconsciously and uncontrolled done hirudotherapy which can become a serious life-threatening health problem. For this purpose, a rare case using warfarin for deep vein thrombosis in his legs and who admitted to emergency department with skin hemorrhages and hemorrhagic shock due to unconsciously done hirudotherapy is presented.

**Key Words:** Hemorrhagic shock, leech bite, hirudotherapy

#### ÖZET

Hirudoterapi, sülükler kullanılarak yapılan alternatif bir tedavi yöntemidir. Özellikle ağrı, siyaledenit, osteoartrit ve venöz yetersizlik tedavisi için kullanılmaktadır. Sülüklerin salgısında bulunan hirudin adlı madde kan koagulasyonunu önleyerek kanamaya neden olmaktadır. Bu yazıda, bilinçsiz ve kontrolsüz yapılan hirudoterapinin aşırı kanamaya neden olarak hayati tehlike oluşturabileceğine dikkat çekilmesi amaçlandı. Bacaklarındaki derin ven trombozu nedeniyle warfarin kullanan ve bilinçsiz hirudoterapi uygulamasına bağlı olarak cilt kanamaları ve hemorajik şok ile Acil Servise başvuran nadir bir olgu sunuldu.

**Anahtar Kelimeler:** Hemorajik şok, sülük ısırması, hirudoterapi

#### INTRODUCTION

Although there are certain changes in the application method of Hirudotherapy, it has been used for many centuries. Among leech species, especially *Hirudo medicinalis* and *Hirudo Michaelsoni* are used in treatment. In the treatment, several substances and enzymes that are found in its secretion are used. Hirudin which is one of the most secreted substances prevents blood coagulation. In addition, anti-inflammatory,

bacteriostatic and analgesic substances are secreted<sup>1</sup>. In modern medicine Hirudotherapy is especially used in plastic surgery as well as in the treatment of pain, sialadenitis, osteoarthritis and venous insufficiency<sup>1-4</sup>.

In this paper, we presented the case of a 56 years old male patient who was using warfarin for deep vein thrombosis in his legs before his admission to emergency department with skin hemorrhages and hemorrhagic shock due to

multiple leech bites in a pond containing lots of leeches. We aimed to draw attention to the dangers of unconsciously and uncontrolled done hirudotherapy.

### CASE

The 56 years old male patient was brought from another hospital to our emergency department due to skin hemorrhages and hypotension. In his medical history, we learned that he was taking warfarin due to deep vein thrombosis in both of his legs and he entered into a pond full of leeches on the recommendation of his neighbors. As bleeding at the places of the bites of leeches continued in the form of leakage, he was brought to our clinic after admission to another hospital.

When the patient was brought to our emergency department, he was conscious, cooperative and oriented. His Glasgow coma scale

score was 15. Vital findings were measured as blood pressure: 80/50 mmHg, respiration rate: 24 /min, pulse rate: 100 beat/min, SPO2 97%. The patient had pale skin and conjunctiva. Edema and redness was observed in both of his legs. On this skin, there were bleedings including different size of more than 100 pinhead like petechial areas and ecchymoses around lesions due to leech bites (Figure 1). Other systemic examinations were normal. According to the first laboratory examinations; white blood cells:  $10.86 \times 10^3$  K/ $\mu$ L (normal range:  $4.3-10.3 \times 10^3$  K/ $\mu$ L), hemoglobin (Hb): 9,2 g/dL (normal range: 13.6-17.2 g/dL), hematocrit (Htc): 28,5% (normal range: 39.5%-50.3%), thrombocyte count: 210000 / $\mu$ L (normal range: 156000 -373000 / $\mu$ L), International normalized ratio (INR): 5,67 (normal range: 0,85-1,2), and aPTT: 42,3 second (normal range: 26-37.2 sec). Other laboratory findings were normal.



**Figure 1.** Bleedings including different size of more than 100 pinhead like petechial areas and ecchymoses around lesions due to leech bites were observed.

The patient started to be treated with 20 cc/kg rapid saline infusion. Due to ongoing active bleeding and low Hct values as well as the fact that he was using warfarin, he was administered with erythrocyte suspension and fresh frozen plasma. The patient was given 5 units of erythrocyte suspension and 3 units of fresh frozen plasma until his vital signs became stable. His lesions were cleaned with antiseptic solution, and pressed tampon was applied to these lesions. The patient was hospitalized in the cardiovascular surgery clinic for the follow-up. The bleeding was persisted intermittently in next 48 hours after first admission to emergency department. The patient was discharged from the hospital on the 7<sup>th</sup> day of his admission after bleeding completely stopped and normal laboratory levels were reached.

## DISCUSSION

As Hirudotherapy's therapeutic effect has been historically known and with its increased use in modern medicine as well as due to the increased number of announcements in the visual and printed media, public interest in hirudotherapy has increased. As leeches are easily available because of their existences in natural environments, and the frequency of complications is increasing due to application without taking necessary measures against possible complications and for side effect planning, indications and contraindications of hirudotherapy. Hirudotherapy is applied locally and is being used with care by inquiring the patient's blood coagulation disorder or drug utilization. Although hirudotherapy should not be used in the cases of allergic reactions against one of the substances contained in the secretion, in pregnancy and in hemorrhagic diathesis that our patient is included within the group of patients who should not receive hirudotherapy due to hemorrhagic diathesis developed by the usage of warfarin.

*Hirudo medicinalis* has an approximately 10 cm long, cylindrical body with two suckers: one present anteriorly on the head, and the other on the posterior end. The mouth lies in the anterior sucker and has three jaws with teeth well designed for biting. The leech can ingest 5–15 ml blood almost ten times its own weight. Leech bites are painless and results in a triradiate wound which remains open for a long time and heals slowly<sup>5,6</sup>. The saliva of the leech contains hirudin, which inhibits thrombin in the clotting process, and histamine-like substances which may cause continuous bleeding by preventing closure of capillaries<sup>7</sup>.

Complications of Hirudotherapy include infections, bleeding and allergic reactions<sup>1</sup>. Its most notified complication is bleeding as in the case of our patient. Furthermore, hemorrhagic shock was developed due to a serious bleeding according to the effects of hirudin and warfarin.

Munro et al reported that hirudin has only a transient antithrombin effect, lasting only about 15 minutes in humans. The prolonged duration of bleeding can be attributed to collagen-platelet interaction, along with possible modifications of the vascular walls by proteases or other enzymes secreted by the leech during feeding<sup>8</sup>. Prolonged haemorrhage may result in anaemia, and deaths from excessive exsanguination have been reported<sup>5</sup>. Leech bite-related bleeding may continue for a long time. İközceli et al reported that the bleeding due to leech bite continued for three hours and persisted intermittently for the next 18 hours, although their patient did not have any haematological problems or usage of warfarin<sup>9</sup>. Also in our case, bleeding persisted intermittently in next 48 hours after admission to emergency department.

Hemorrhages due to hirudotherapy can cause local or rarely systemic effects. Contamination with pathogenic microorganisms may result in erysipelas and submucosal abscesses<sup>5,6</sup>. Leech

application can also cause infection with *Mycobacterium marinum*, a parasitic bacteria usually hosted by salt water fish, or with *Aeromonas hydrophilia*, which leeches carry in their gut<sup>10</sup>. As a medicinal leech bite heals, ecchymosis and scarring are not uncommon sequelae<sup>5</sup>.

Hemorrhages have been indicated to be as nose, pharynx, larynx, esophagus, intra articular, rectum, urinary tract, rectum, vagina bleedings<sup>11-14</sup>. Cases of serious hemorrhages due to leech treatment are rarely notified. In the case report presented by Köse A et al in 2008, the patient had 140 bleeding points on the body causing serious anemia following bath in a pond<sup>15</sup>. Kavaklı et al reported a case who was using warfarin and developed bilateral hemarthrosis after hirudotherapy<sup>16</sup>.

In the treatment of leech bite, if the leech is still in place, it should be removed with the help of table salt, a saline solution, or vinegar. It should not be forcibly removed because its jaws may remain in the wound, causing infection. After removing the leech, pressure should be applied to the wound. If the bleeding persists, sterile gauze soaked in thrombin solution may be applied. After control of bleeding, the wound should be rechecked for signs of infection<sup>5</sup>. If the patient is in hemorrhagic shock, and there is serious fall in hematocrit value, infusion of saline and erythrocyte suspension should be immediately given to the patient. If there is excessive increase in the value of PTZ and INR, fresh frozen plasma should be given.

## CONCLUSION

The method of hirudotherapy is becoming widely used in modern medicine, and it is necessary to perform it by experienced persons after specification as suitable indication and with leeches bred in isolated circumstances. Necessary measures should be taken for possible side effects and complications which might develop during this treatment. It must be emphasized with trainings

and warnings that performing hirudotherapy in an ignorant manner is a public health issue that may be life endangering.

## REFERENCES

1. Singh AP. Medicinal leech therapy (hirudotherapy): a brief overview. *Complement Ther Clin Pract*. 2010;16:213-5.
2. Whitaker IS, Izadi D, Oliver DW, Monteath G, Butler PE. *Hirudo Medicinalis* and the plastic surgeon. *Br J Plast Surg*. 2004;57:348-53.
3. Abal'masov DV, Afanas'ev VV, Pozharitskaia MM. Leeching in the treatment of chronic inflammatory and dystrophic diseases of the salivary glands. *Stomatologiya (Mosk)*. 2003;82:43-6.
4. Teut M, Warning A. Leeches, phytotherapy and physiotherapy in osteo-arthritis of the knee-a geriatric case study. *Forsch Komplementmed*. 2008;15:269-72.
5. Adams SL. The emergency management of a medicinal leech bite. *Ann Emerg Med*. 1989;18:316-9.
6. Faust EC, Russel PF, Jurg RC. *Craig and Faust's Clinical Parasitology*, 8th ed. Philadelphia, Lea & Febiger, 1970.
7. Shamsaddini S, Dabiri S. Basal cell carcinoma on nickel dermatitis after leech applying. *East Mediterr Health J*. 2000;6:197-9.
8. Munro R, Hechtel FO, Sawyer RT. Sustained bleeding after a leech bite in the apparent absence of hirudin. *Thromb Haemost*. 1989;61:366-9.
9. İkizceli İ, Avşaroğulları L, Sözüer E, Yürümez Y, Akdur O. Bleeding due to a medicinal leech bite. *Emerg Med J*. 2005;22:458-60.
10. Whitlock MR, O'Hare PM, Sanders R, Morrow NC. The medicinal leech and its use in plastic surgery: a possible cause for infection. *Br J Plast Surg*. 1983;36:240-4.
11. Cundall DB, Whitehead SM, Hechtel FO. Severe anaemia and death due to pharyngeal leech *Myxobdella africana*. *Trans R Soc Trop Med Hyg*. 1986;80:940-4.

12. Kavaklı H, Tanrıverdi F. Bilateral Hemarthrosis due to Hirudotherapy: Case Report. Akatos. 2010;1:20-2.
13. Deka PM, Rajeev TP. Unusual cause of hematuria. Urol Int. 2001;66:41-2.
14. Saha PK, Roy S, Bhattacharya D, Mukherjee P, Naskar T, Bhuiya A. Leech bite: a rare gynecologic emergency. MedGenMed. 2005;7:73.
15. Kose A, Zengin S, Kose B, Gunay N, Yildirim C, Kilinc H et al. Leech bites: massive bleeding, coagulation profile disorders, and severe anemia. Am J Emerg Med. 2008;26:1067.
16. Kavaklı HŞ, Tanrıverdi F. Bilateral hemarthrosis due to hirudotherapy: case report. Akademik Acil Tıp Olgu Sunumları Dergisi. 2010;1:20-2.

**Yazışma Adresi / Address for Correspondence:**

Dr. Mehmet Oğuzhan Ay  
Adana Numune Education and Research Hospital  
Department of Emergency Medicine  
Ege Bagatur Bulvarı üzeri,  
01240, ADANA  
e mail: droguzhan2006@mynet.com

geliş tarihi/received :22.08.2013  
kabul tarihi/accepted:16.09.2013