

Novel treatment (new drug/intervention; established drug/procedure in new situation)

Prolonged bleeding due to a medicinal leech bite: another treatment method, primary suture

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Summary

Medicinal leeches have been used in the treatment of many diseases for thousands of years. A 25-year-old man presented to our emergency department with bleeding from right and left side of his neck. He had applied leeches 10 h previously to both sides of his neck to treat acne. The bleeding was not controlled by applying pressure with sterile gauze upon the wounds. Homeostasis was achieved by primary suture under local anaesthesia. Prolonged bleeding can be seen following medical leech application. In such cases, bleeding can be controlled by primary suture.

BACKGROUND

Medicinal leeches (*Hirudo medicinalis*) have been used for thousands of years in the treatment of many diseases, ranging from headaches and haemorrhoids to mental illness.¹ Despite the historical variations in leech therapy, the art of leech therapy remains useful to modern medicine. Today, medicinal leeches are used both by physicians and by lay health practitioners in many countries throughout the world. In Turkey and also in worldwide, medicinal leech therapy is used in traditional folk medicine for venous disorders, bloodletting, all types of headache, migraine, arthritis, glaucoma, abscesses, hypertension, impotence, acne, rheumatism, epilepsy, diabetic wounds, surgery scars and pain relief.²⁻⁴ Most patients get symptomatic relief

with this treatment. Physicians have used leeches for flap repairs, to maintain local circulation after reimplantation, and following breast and thoracic wall reconstructions.³ Despite having been in recorded medical use for centuries, research continues to be conducted into this therapy.

People prepare the leech application in their houses with traditional knowledge in Turkey. These applications are not controlled by medical institutions. The application is performed with leeches which live in nature water sources or in places where leeches fattening is made. Leech fattening is constructed in two ways providing nourishment the leech with blood by using different methods (production and fattening in laboratory condition; production and fattening in big aquarium and tanks). Live snails and frogs are



Figure 1 Bleeding after leech bites the patient.



Figure 2 Appearance after primary suture.

Table 1 Important biologically ingredients in leech saliva and potential functions¹

Molecule	Potential function
Hirudin	Inhibitor of thrombin, blocking formation of fibrin clots
Histamine-like substance	Increasing vascular permeability in the host
Saratin	Binds to exposed host collagen in ruptured blood vessels and inhibits attachment of von Willebrand factor
Calin	Binds to exposed host collagen in ruptured blood vessels and inhibits attachment of von Willebrand factor
Hyaluronidase	Cleaves hyaluronic acid in host extracellular matrix
Collagenase	Cleaves collagen in host extracellular matrix
Apyrase	Cleaves adenosine 5'-diphosphate (ADP), inhibition of platelet activation
Destabilase	Cleavage of isopeptide bonds in stabilised fibrin, thrombolysis

leaved into the tank or aquarium to feed the baby leeches. Young leeches hatch from eggs in 24–28°C temperature within 28 days and in 18–20°C temperature within 35–45 days.⁵

The potential complications associated with this kind therapy include infections with *Aeromonas* species, prolonged bleeding, anaemia and allergic reactions.⁴ These complications are rarely seen in emergency departments. Here, we report a case of a patient with prolonged bleeding after medicinal leech bites. With this study, we aimed to discuss the potential for uncontrolled bleeding due to leech bites, consequent excessive skin haemorrhage, and primary suture as an approach to treatment.

CASE PRESENTATION

A 25-year-old man presented to our emergency department with bleeding from both sides of his neck. According to the information acquired from the patient, he had applied leeches to both sides of his neck 10 h previously to treat acne. The leeches had stayed in place for 2 to 3 h

on both sides of his neck. After the leeches spontaneously detached, he dressed his wounds. However, the bleeding did not stop despite the use of compression and dressings. He came to our emergency department approximately 7 h after the leeches had spontaneously detached. He had no disease or bleeding diathesis and he was not taking any medication. On initial evaluation, his general condition was good; he was alert, cooperative, and oriented and in no acute distress. His vital signs revealed a pulse of 85/min, blood pressure of 120/70 mm Hg, body temperature of 37.1°C, SaO₂ at 98% on room air and a respiration rate of 15/min. On physical examination, the patient's entire neck was covered with blood. On detailed examination, traces of leech bites were found on various regions of the neck (figure 1), together with active haemorrhages and surrounding ecchymosis. Blood was oozing from six lacerations on the right and left sides of the neck (two on the right side and four on the left side of the neck). His physical examination was otherwise normal. Laboratory findings revealed: white blood cells 7500/μl (reference range (RR) 4.3–10.3×10³/μl), haemoglobin 15.2 g/dl (RR 13.6–17.2 g/dl), haematocrit 43.2% (RR 39.5%–50.3%), platelets 185000/μl (RR 156000–373000/μl), prothrombin time 13.0 s, activated partial thromboplastin time 34.2 s and international normalised ratio 1.02. Other complete blood cell count parameters and biochemical values were normal.

All of the bleeding wounds were cleansed with betadine and dressed with tight bandages of sterile gauze. The patient was then observed in the emergency department; however, his bleeding did not cease. Although the bandages were changed several times and compression was applied to the bleeding points, active haemorrhage continued. Therefore, his wounds were sutured with 3/0 prolene (figure 2). His bleeding was stopped within 6 to 7 h of admission to the emergency room. On follow-up, the patient had no re-bleeding and was discharged from the

hospital with the recommendation to return for a control examination, and was given ciproflaxacin (cipro) 500 mg (2×1 PO). The patient's control examination did not reveal any problems.

DISCUSSION

Medicinal leeches have been used in medicine for thousands of years to treat a wide variety of ailments.^{1–2 5} Leeches are invertebrates of phylum Annelida and class Hirudinea, and measure approximately 12.5–15.25 mm in length.^{1 5} They have two suckers, one in the anterior region and one in the posterior, and they usually feed via the anterior suckers. Leeches attach to their host and can suck 5–15 ml of blood and remain there until they become full, at which point they fall off to digest the blood.^{1 6} In our patient, according to the information acquired from the patient, the leeches had stayed in place for 2 to 3 h.

Leech saliva contains a histamine-like vasodilator, hirudin, calin and hyaluronidase. The prolonged bleeding after a leech application is due to the action of these factors.^{1 6} Hirudin has an antagonistic effect against thrombin, which is an important enzyme that converts fibrinogen to fibrin in the coagulation cascade. The antagonistic effect of hirudin is a temporary effect that ends in about 15 min and causes a decrease in platelet aggregation.⁷ Calin has a powerful action as an anticoagulant that binds to exposed host collagen in ruptured blood vessels and inhibits attachment of von Willebrand factor.^{7 8} Histamine-like substance is another protein that causes vasodilation of the blood vessels.^{1 9} Another enzyme, hyaluronidase, cleaves hyaluronic acid in the host extracellular matrix.^{1 10} Other important biologically active ingredients in leech saliva include enzymes such as collagenase, destabilase and apyrase. Among these, apyrase cleaves adenosine 5'-diphosphate, thereby inhibiting platelet activation.^{1 11} The prolonged duration of bleeding can therefore be caused by small molecules (histamine-like substance), modulators (sarin, calin) and other enzymes (hyaluronidase, collagenase, apyrase, destabilase) secreted by the leeches as they feed (table 1).^{1 7 12} Sustained bleeding after a leech bite can persist for a mean of 10 h and as long as 7 days.⁷ In our patient, although he did not have any haematological problems, his bleeding continued for 16 to 17 h.

A leech bite can be diagnosed simply on the basis of patient history and examination. Patients usually have a history of medicinal leech application. If a leech is found on the body, it should be removed with salt, a saline solution, vinegar or lignocaine solution; it should not be removed forcefully because its jaws remain in the host body and may cause infection.¹³ *Aeromonas hydrophila* is found in the flora of the leech intestine¹⁴ and it can cause infection in the host. Antibiotic therapy following medicinal leech application is recommended. For this purpose, third generation cephalosporins, aminoglycosides, trimethoprim-sulfamethoxazole and ciprofloxacin are used.⁷ In our patient, ciproflaxacin (Cipro) 500 mg (2×1 PO) was given as a prophylactic.

Although it rarely occurs, a leech bite may also cause death.^{7 15} The morbidities associated with leech bites are mainly due to two factors: mechanical obstruction of a vital organ and/or severe bleeding.^{7 16} Prolonged bleeding

can lead to serious consequences such as shock, and hence require blood transfusion.⁶ Prolonged bleeding after a leech bite should be treated seriously. In such cases, pressure should be applied to the wound either with sterile gauze or sterile gauze soaked in thrombin solution.^{3 6} In cases of bleeding that fails to stop despite application of compression and dressings, another treatment method is primary suture of the wound,¹⁷ although one study did not recommend suturing the lesion.¹⁸ In our case, thrombin solution was not available to us, so we cleansed all of the bleeding wounds with betadine to reduce the possibility of infection, and tight bandages with sterile gauze were used as dressings. However, since the bleeding was not stopped by these applications, we stopped the bleeding by primary suture under local anaesthesia.

CONCLUSION

Prolonged bleeding seems to be a common complication of leech bites and can be diagnosed simply on the basis of patient history and examination. This bleeding may even result in death due to blood loss. Therefore, this type of case should be considered an emergency and all precautions should be taken to avoid more bleeding. Primary suture may be considered as a treatment for leech bite bleeding that cannot be stopped with other methods.

Learning points

- ▶ The leeches biting can cause bleeding for a long time.
- ▶ Primer suturing should be thought in case of bleeding that can not be stopped.

Competing interests None.

Patient consent Obtained.

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