

Leeches and their effective use in veterinary medicine

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Rosie Fernee RVN, explains how leeches were used in practice, with a case study of a spaniel with a complicated hindlimb injury

LEECHES have been used in medicine since the beginnings of civilisation. They are increasingly being used in human medicine for plastic and reconstructive surgery or on tissue suffering from impaired venous circulation. This article aims to give a brief overview of their actions and benefits.

There are 650 known species of leech, all of which are carnivorous and move using suckers. The leech belongs to the phylum Annelida, a group that includes earthworms and several other members. Leeches are hermaphrodite but cannot self-fertilise. The species commonly used for medicinal purposes is *Hirudo medicinalis*. Blood-letting and the therapeutic use of *H medicinalis* dates back to ancient Egypt, and was also used in medieval medicine in an attempt to “balance the four humours”.

Medicinal uses

The first reported modern-day use of leeches for alleviating venous engorgement following flap surgery was published in 1960. Since then, there have been many case reports describing the successful use of leeches to alleviate venous congestion.

A leech identifies a potential host by movement and heat production, which is detected by chemoreceptors on the leech’s anterior sucker. Attachment and feeding can depend on temperature, as leeches rarely bite below 25°C and prefer temperatures of 33-40°C. The leech

secretes a number of active chemicals into the wound as it feeds. These facilitate prolonged bleeding to allow the leech adequate time to feed, uninhibited by clotting. The leech will detach itself when it is full.

Leeches on arrival

Leech therapy is extensively used by reconstructive surgeons to remove stagnant blood pooling in wounds, which may lead to increased venous blood pressure and inhibit the flow of fresh, oxygenated arterial blood from entering the area to supply the wound with nutrients and oxygen. By reducing venous blood pressure through leech therapy, blood pooling pressure can be reduced in order to save limbs or skin flaps.

Indications of impaired venous circulation include:

- oedema;
- slow capillary refill time;
- slow bleeding response when pinpricked;
- darker or slightly cyanotic skin colour; and
- known problems with blood supply at time of surgery.

The best-known salivary product of the leech is hirudin, which is a potent anticoagulant. Hirudin inhibits thrombin, which stimulates the release of platelet activation factor and also converts fibrinogen into fibrin, to stabilise clots. Each bite wound will continue to ooze for up to 10 hours or more.

It has not been possible to simulate this effect using anticoagulants, such as heparin, into small stab wounds and, unlike heparin, hirudin does not interfere with the biosynthesis of clotting factors. Secretions from the leech's saliva also contain anti-inflammatory, bacteriostatic and analgesic actions, as well as a histamine-like vasodilator that increases regional blood flow. Leeches commonly only absorb approximately 5ml of blood; therefore, to increase efficiency, multiple leeches may be required.

Case report

The patient was a geriatric spaniel. The patient's hindlimb had been stepped on by a horse, fracturing all four metatarsal bones. Surgery had been performed to internally stabilise the metatarsals with bone plates and pins.

There was some concern over the blood supply to the foot postoperatively, characterised by oedema, erythema and a serosanguinous discharge from the skin. A Doppler probe was used to confirm the presence of arterial blood flow to the foot, as leech therapy cannot help in cases with insufficient arterial blood flow.

The patient was started on intravenous antibiotics and an initial attempt was made to dissipate the swelling using elevation and cold compresses. Leeches were then ordered and arrived by courier the same day. The leeches were applied one by one to different parts of the foot. They latched on fairly easily and it was not necessary to prick the skin in order to encourage them to feed. After they had become engorged and detached themselves, any clots were gently dislodged. The leeches' bite wounds continued to bleed for some time.

Outcome

The foot improved greatly as a result of the treatment and the patient went on to recover. The leeches could not be re-used due to the risk of cross-contamination so were euthanised in alcohol.

References and further reading

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