

Title: LEECH THERAPY

Responsibility: Physician along with RN

Purpose: Leeches main therapeutic benefits are not derived from the blood removed during biting (although this may provide dramatic relief at first), but from the anticoagulant and vasodilator contained in the leech saliva. Leeches are generally useful on replanted digits, ring avulsion injuries and in small free flaps where there is good arterial inflow but no venous outflow. Before the decision to use leeches is made, however, it is recommended that consideration be given to other methods for improving circulation, such as operative revision of microvascular anastomoses, removal of sutures to relieve tension, etc.

It is very important that leeches only be used in conditions of venous congestion with good arterial inflow. Leeches will not be helpful in cases of insufficient arterial inflow. Insufficient arterial supply could lead to infection from any source, including the leech. The following criteria may help in diagnosing a true venous problem in a flap:

- Skin Color – Dusky or bluish
- Capillary Return – Brisker than normal (note that areas of fixed coloration are beyond salvage)
- Pinprick Response – Bleeding should be rapid and dark
- History – Known problems with veins at operation, either in the pedicle or at the site of a microvascular anastomosis.

Equipment:

1. Jar of leeches in distilled, nonchlorinated or bottled water containing Hirudo salt, obtain from pharmacy (**DO NOT use tap water**).
2. Disposable bottle of sterile water
3. Packet of gauze swabs
4. Non toothed forceps/hemostats
5. Sterile opsite dressing (optional)
6. 5 ml plastic syringe with plunger removed
7. Sterile gloves

Specific Notes: Although following application the leeches suck an approximately 5 ml of blood from the bite site, further oozing of blood from the site continues for 6 to 8 hours resulting in an additional venous drainage of 10 ml to 50 ml. Repeated application of leeches on the flaps may be necessary for 3 to 7 days or longer.

Procedure

Point of Emphasis

Maintenance of leeches:

Avoid heat and chlorinated tap water.

Keep leeches cool, 42-45 degrees. Avoid temperatures above 68 degrees, never place leeches in direct sunlight.

Water should be changed every other day by Pharmacy.

Water should have 2 grams Hirudo salt for each gallon of distilled, nonchlorinated or bottled water.

Avoid sudden temperature changes when transferring leeches from one container to another.

The container leeches are kept in should have a lid, with any perforation having a cloth cover tightly secured with string or rubber band.

Leeches are amphibious and like to crawl about.

Perforations are advised, but they must be very small because the elastic leech body is capable of going through very small openings.

Procedure

Point of Emphasis

Patient teaching:

The physician should explain the procedure to the patient and/or family with additional support as needed.

As with any procedure, a patient's attitude towards the therapy depends largely on explaining the process.

It may also be beneficial to note that this procedure is quite painless, mainly because the area to be treated is usually denervated and the leech produces its own anesthetic.

Applying Leeches:

Assess leech and apply in adequate numbers as per physician orders. Use sterile gloves to handle leeches.

1-2 leeches may be sufficient to treat a small area (e.g. finger), where as a large flap may require 6 or more leeches.

1. Clean patient's skin thoroughly with soap and water, rinse cleaned areas with distilled, nonchlorinated or bottled water.

Removes all substances with strong odor or taste.

2. Using a 5 ml plastic syringe with plunger removed, place the leech in the barrel.

To assess the leech for the head (or biting end); observe the leech before placing in the barrel.

Invert the barrel, placing the open end on the wound site, where you want the leech to attach.

The head can be recognized by its searching movements, while the tail end is used mostly as a sucker for attachment.

Once feeding commences, remove the syringe.

3. To prevent leech wandering, form a barrier by cutting a 1 cm hole in the middle of a dampened gauze square and locating the hole in close contact with the area to be treated.

Maintains leech in prescribed area.

4. Steer the leech's head to the area to be treated.

Sugar or other sweet substances are not necessary.

Attachment generally occurs quickly; however, if the leech is reluctant to bite, make a small needle prick on the skin to produce a tiny droplet of blood (which should result in enthusiastic attachment) or try another leech.

It should be noted that persistent resistance to feeding is often indicative of poor arterial supply.

5. Once the leech is attached, it typically will remain attached until fully distended.

The physician should always put a 2-0 silk suture through the midsection of a leech.

The suture should not be tied.

Hold both ends with a hemostat.

This prevents the leech from migrating to other parts of the body away from site of application.

The gauze square can be removed and discarded; however, it is important that the site be checked frequently to insure that the leech hasn't moved.

Please Note: The actual benefit is sustained for 6-8 hours following the initial attachment.

Usual application interval is every 6-8 hours; therefore, if the leech is attached, and then falls off after feeding, another leech is not normally attached until the 6-8 hour interval.

6. When the leech has completed feeding, it will detach itself.

Length of time for the feeding is generally 45 minutes.

Procedure

Point of Emphasis

Documentation:

Electronic medical record

Any applicable teaching, time, procedure, number of leeches applied and to what area, length of time the leeches are attached, patient's response to therapy.

General Patient Care:

The area around leech bite wounds should be routinely observed for local infection, and culture swabs taken if indicated and ordered by physician.

Leech bite wounds may continue bleeding locally for 24-48 hours due to pharmacologically active secretions (anticoagulant and a local vasodilator).

If bleeding is present, patient's hemoglobin levels should be checked daily or as per physician order.

It is quite possible for significant falls in hemoglobin levels to occur.

A prophylactic antibiotic should be ordered for the entire duration of leech therapy to prevent *Aeromonas* infections (normal flora of leech gut).

Trimethoprim/sulfamethoxazole, ciprofloxacin, or cefepime are acceptable options.

Ensure either trimethoprim/sulfamethoxazole, ciprofloxacin, or cefepime is ordered for leech therapy.

Post-Bite Care of Wounds:

The major therapeutic effect of leech application occurs during the post bite period, and depends greatly on the care given to the bite wounds.

To remove local clot, use a sterile swab moistened with sterile water.

DO NOT USE TAP WATER OR SALINE.

Each bite must be encouraged to bleed by the gentle removal of any locally forming clot at regular intervals.

Clinical response of the tissue being treated should be closely observed during this period.

Disposal of Leeches after Use:

Leeches that have been used on a patient should be disposed of by placing in a container with enough 70% alcohol to cover the leech(es) for 5 minutes, with the leech then disposed of in a Chemotherapeutic biohazard waste container.

Chemo Biohazard Waste containers are automatically incinerated to meet Ohio EPA Infectious Waste Division guidelines for infectious waste due to the volume of blood ingested by leeches.

The 70% alcohol should be discarded in a waste alcohol container from pharmacy that is clearly marked as having been used.

70% alcohol is also a hazardous waste.

Return unused leeches to the pharmacy in distilled, non-chlorinated or bottled water containing HIRUDO salt.

IMPORTANT WARNING:

NEVER REUSE a Leech and NEVER RETURN an used leech to the Pharmacy.

NEVER put a used leech with unused ones.

As with a contaminated needle, failure to comply with this warning could result in transmittal of serious infectious diseases.

Leech Therapy Guidelines

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Reference: Leeches U.S.A., LTD Retrieved September 5, 2023 from <http://www.leechesusa.com>

1. Infection as a complicating factor and resistance pattern of *Aeromonas* spp. - <https://www.ncbi.nlm.nih.gov/pmc/articles/PMC3757849/>
2. Recommendation for prophylaxis until wound closure and agents to use - <https://www.ncbi.nlm.nih.gov/pmc/articles/PMC4268569/>
3. Impact of a prophylaxis guideline on subsequent *Aeromonas* spp. Isolation - <https://link.springer.com/article/10.1007%2Fs11096-014-9986-x>
4. Choice of agent (Bactrim versus quinolone) - <https://www.ncbi.nlm.nih.gov/pubmed/25423029>