

Hirudotherapy for Venous Congestion in an Almost Completely Avulsed Earlobe without Microsurgical Repair

Nikoletta Vargas, DMD, MS,
PhD*†

Benn Lieberman, DMD*†

Lyahn Hwang, MD‡

Victor Badner, DMD, MPH*†

Summary: Venous congestion is a frequent and challenging complication after re-attachment or replantation of avulsed tissues, body parts, and flaps. It is often the reason for failure. One of the successful therapies to prevent and/or treat venous congestion is the use of medicinal leeches. There is sound evidence for its efficacy in plastic and reconstructive surgery for avulsed body parts or flaps. However, there is not enough evidence for its use in ear reconstruction or replantation, especially regarding the fragile tissue of the earlobes. The current study is the first in the literature to describe the use of hirudotherapy for venous congestion in an almost completely avulsed earlobe without microsurgical blood vessel repair, as a last resort in an otherwise healthy 38-year-old male patient who sustained trauma due to physical assault. (*Plast Reconstr Surg Glob Open* 2023; 11:e5030; doi: [10.1097/GOX.0000000000005030](https://doi.org/10.1097/GOX.0000000000005030); Published online 26 May 2023.)

There are a few suggested approaches in the literature, which can be applied in a prophylactic manner for venous congestion and thrombosis. The approaches can be used also in emergency cases for the management of venous congestion. Application of topical agents,^{1,2} devices for continuous drain,³ negative pressure wound therapy and incisions to allow outflow of accumulated venous blood,⁴ and the use of medicinal leeches^{5,6} are the most common approaches. The most frequently used leech species is *Hirudus medicinalis*. Leeches mechanically reduce the accumulated blood volume through continuous bleeding. Additionally to the active suctioning properties, their saliva contains vasoactive substances, such as Hirudin—a potent thrombin-specific inhibitor, released in the host that furthermore facilitate the passive oozing.⁷ Once the physiological blood circulation in a distressed tissue is impaired, the risk of necrosis in the reattached avulsed tissue increases dramatically. The present case report focuses mainly on the use of hirudotherapy to minimize the risk of tissue necrosis due to venous obstruction.

CASE REPORT

A 38-year-old man with no significant medical history presented to the emergency department of Jacobi Medical Center, Bronx, New York, minutes after being assaulted. He sustained an almost complete avulsion of the right earlobe (Fig. 1), as well as other lacerations to his face and multiple blunt traumas to his body. The earlobe was clinically evaluated by the OMFS team on call 30 minutes after the accident. Fortunately, it had a 3-mm intact residual bridge of skin with viable blood vessels connecting it to the rest of the ear. The decision was made to re-attach the earlobe as quickly as possible to prevent damage to the fragile residual skin bride. Microsurgical repair was not possible due to the lack of a microscope at that time. The ear was anesthetized with epinephrine-free lidocaine,⁸ thoroughly cleaned with sterile 0.9% saline solution and inspected for foreign bodies. The earlobe was repaired before the rest of the facial lacerations, as time plays a significant role for the survival of reimplanted tissues. It was reattached to its original position with multiple deep simple interrupted resorbable 5.0 Vicryl Plus sutures, as well as multiple interrupted superficial nonresorbable 5.0 Prolene sutures. Unexpected internal tissue hematoma was observed immediately after repair. A violaceous color of the tissue proximal to the ear, complete ischemia and whitish color of the earlobe were observed. Immediate re-opening of the superficial sutures, drainage, and cleaning of the hematoma was performed. Placement of several additional deep interrupted resorbable 5.0 Vicryl Plus sutures within the tissue proximal to the earlobe led to instant hemostasis, and the earlobe returned to its normal color.

From the *Department of Dentistry, Albert Einstein College of Medicine, New York, N.Y.; †Oral and Maxillofacial Surgery, Jacobi Medical Center, Bronx, N.Y.; and ‡Department of Plastic and Reconstructive Surgery, Montefiore Medical Center, New York, N.Y. Received for publication July 27, 2022; accepted April 6, 2023.

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DOI: [10.1097/GOX.0000000000005030](https://doi.org/10.1097/GOX.0000000000005030)

Disclosure statements are at the end of this article, following the correspondence information.



Fig. 1. Preoperative status, about 30 minutes after accident: almost complete avulsion, with 3 mm residual skin bridge.



Fig. 2. Status 2 days postoperative: despite repeated attempts for incision and drainage, there was visibly increasing venous congestion, edema, cyanosis, pressure, and worsening pain.

The postoperative medication included Percocet for pain management, aspirin for prevention of blood coagulation in the repaired area and cefalexin and bacitracin as antibiotic prevention of postoperative wound infection. The re-evaluation at the OMFS clinic in the morning showed concerning venous congestion. The earlobe was found to be edematous, with deep cyanosis. Additionally, the patient reported constant and increasing pressure and worsening pain. Immediate venous “letting” was attempted, using an 11-blade scalpel for three 4mm wide and 3mm deep incisions. Patient reported immediate relief of pressure. The same approach was repeated the next day. However, the patient continued to report pressure, pain, increasing earlobe size, and darkening of tissue color consistent with worsening venous congestion (Fig. 2). Considering the unfavorable prognosis, a decision was made to initiate a course of hirudotherapy as a last resort treatment. The patient was admitted in the Montefiore Medical Center, New York, under the service of the plastic and reconstructive surgery department. The 5-day hospital course included leech application QID (Fig. 3), systemic anticoagulation therapy with 325 mg aspirin daily, and antibiotic prophylaxis with ciprofloxacin 500 mg BID against infection with *Aeromonas* species after infectious disease was consulted.^{9,10} Over the course of therapy, the venous congestion resolved, with reduced edema, improved perfusion

with bright red bleeding, warmth, and reported sensation. The patient underwent the hospital course without complications or adverse events. Antibiotic prophylaxis was continued for 3 days after completion of hirudotherapy. The tissue remodeling continued to take place without further complications (Fig. 4). Three weeks after the repair, the earlobe fully regained sensitivity, and was considered aesthetically acceptable by the patient. A scar repair was performed in the operating room 14 weeks after earlobe replantation.

DISCUSSION

Auricular replantation has always been challenging because of the lack of suitable veins for anastomosis due to the fact that most veins in the ears are small, very thin, and fragile,¹¹ which makes venous congestion after ear repair a common complication. Medicinal leeches, also known as hirudotherapy, are a well-tolerated treatment option, with little contraindications, manageable risks and complications, and almost no limitation for the application in terms of body region. Due to their mechanisms of action, oftentimes medicinal leeches are used only as a final treatment option when all other approaches fail.¹² Herlin et al report in their systematic review a success rate of leech therapy of 83.7%.¹³ There is sound evidence for the use of medicinal leeches in plastic and reconstructive surgery for the salvage of avulsed tissue¹⁴; however, there



Fig. 3. Status 3 days postoperative/day 1 of leech application: improved edema, active blood “letting” due to leech suctioning while feeding, observed passive blood oozing.



Fig. 4. Status 2 weeks postoperative: visible tissue regeneration, and continuous tissue remodeling.

is no evidence in the literature about venous congestion after earlobe repair and the use of medicinal leeches to establish physiological tissue reperfusion.

CONCLUSIONS

The authors demonstrate the use of hirudotherapy as a last treatment option for the management of venous congestion after repair of an almost fully avulsed earlobe. The authors emphasize the efficacy of this treatment modality in such cases and suggest it as an essential treatment or prevention of venous congestion, also in fragile and circulation-compromised areas such as earlobes. The current article has the purpose of raising awareness and encouraging clinicians toward more frequent application of hirudotherapy. The authors suggest its use as a part of a routine flap and avulsed tissue protocol.

Nikoletta Vargas, DMD, MS, PhD

Department of Dentistry, Albert Einstein College of Medicine
New York, NY

E-mail: Nikoletta.vargas@alum.urmc.rochester.edu

DISCLOSURE

The authors have no financial interest to declare in relation to the content of this article.

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