

## Treatment of a Nasal Tip Laceration with Adjunctive Leech Therapy: a Case Report

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### Introduction

Traumatic injuries can compromise the vascular supply to tissues. After tissue repair, they are at risk of venous congestion due to the increased duration for venous neovascularisation compared to arterial. If not treated acutely, this can result in tissue necrosis (approximately three hours compared to arterial insufficiency, which takes thirteen hours [1]). There are many ways to treat venous congestion (e.g. anti-coagulants, aspiration, decompression and etc) but an effective well-documented method is by using medicinal leeches [2].

Medicinal leeches (*Hirudo medicinalis*) have been used for hundreds of years in human medicine for a variety of diseases, most recently for venous congestion following reconstructive surgeries (skin flaps and re-implantations) and etc [3].

The majority of similar case reports focus on the replantation of traumatically avulsed ears [4-9] but this report presents a case of postoperative venous congestion of a traumatic nasal laceration following closure. This was successfully reduced using adjunctive leech therapy.

### Report of a Case

A 45-year old woman presented to accident and emergency within an hour after sustaining a blow to the face from a metal pole following an assault. She sustained a complex laceration to her nose. After being cleared from head injury and verifying an up-to-date tetanus status, the patient was urgently referred to the maxillofacial team due to the complexity of the laceration and the possibility of tissue loss with risk of necrosis of the remaining tissues. She was otherwise fit and well, smoking approximately 10 cigarettes daily.

On examination the nasal laceration involved the right columellar to nasal tip, dorsum, left columellar and to anterior maxilla inferior to the anterior nasal spine etc. It is important to note that there was some tissue loss to the left alar rim and the wound was not overtly contaminated with dirt.

Due to the complexity of the wound, it was debrided, irrigated and primary closure achieved under general anaesthesia in a controlled setting. No local anaesthesia was used to avoid compromising the blood supply and the deep layers were closed with 4/0 vicryl and the skin with 6/0 ethilon to the anatomical position. The tissues were bleeding and the edges freshened prior to closure with any compromised tissue being removed. She was also commenced on intravenous Co-Amoxiclav 1.2 g TDS and appropriate wound care was initiated. Medicinal leeches were used periodically; two leeches were placed consecutively and two more consecutively after a two hour duration. Each leech was only replaced when it finished feeding and detached. Once detached, the protocol was followed for the disposal of the leech. Bleeding continued to occur even after the leeches were removed. Prophylaxis against *Aeromonas Hydrophilia* consisted of intravenous Co-Amoxiclav 1.2 g TDS, which was continued for a further seven days post treatment orally with Co-Amoxiclav 625 mg. Revascularisation, occurred after 24 hours commencing of leech therapy and the nasal tip exhibited

signs of improvement. Pre-operatively the tip of the nose was already pale blue and it was thought that primary closure would re-establish vascularisation (Figure 1). On day one post op, it was noted that although initially the tip of the nose was healthy- it showed evidence of venous congestion and following the review of our consultant; the decision was made to commence immediately with leech therapy (Figure 2). The patient was discharged on day two post-operative and followed up in a maxillofacial clinic in five days post-operative (Figure 3).

### Discussion

Venous congestion occurs due to the reduced outflow from compromised venous return most likely from trauma or surgery. This in return increases the vascular pressure leading to reduced arterial



Figure 1: Post-operative view.



Figure 2: Leech therapy initiated.

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Figure 3: One week post operative.

blood flow and perfusion into the tissues. This can lead to intravascular thrombosis and tissue ischaemia resulting in necrosis [2,10].

There are many modalities of treatment for venous congestion but none more localised, simple, effective and as cost efficient as the use of medicinal leeches [11,12]. Medicinal leeches are bred sterile and produce hirudin (a selective thrombin inhibitor) in their saliva amongst other substances, which facilitate the decongestion of venous blood.

Hirudin not only allows the leech to ingest to almost five times its weight but an additional blood loss through bleeding of almost 50 ml over the next 24 to 48 hours [13].

This overall leads to a reduction in capillary pressure and an increase in tissue perfusion. This also allows a better chance for neovascularisation to occur since the process of imbibition and inosculature for a graft to neovascularise takes 96 hours to occur [14] and therefore leech therapy can be used to artificially re-establish venous outflow until permanent outflow is established [14,15].

Leeches have no proteolytic gut flora enzymes and have a symbiotic relationship with *Aeromonas Hydrophila* to denture the haemoglobin. The leeches use the globin and the bacteria use the haem [16]. The main reported complications from the usage of leeches are mainly infection and anaemia. Infection is reported at an incidence of 2.4% to 20% and is mainly caused by *Aeromonas Hydrophila* [7,17]. If the leeches are mishandled inappropriately they can regurgitate the bacteria whilst feeding on the wound. Infections have been reported up to 10 days after starting treatment. Anaemia can develop slowly due to the constant blood loss. Daily haematological investigations should be carried out to identify anaemia and infection. Antibiotics recommended for treatment have been cephalosporins, aminoglycosides, tetracyclines and ciprofloxacin. The course of antibiotics should continue for a week after the cessation of leech treatment [18].

The main contraindications for leech therapy are patients receiving anticoagulant therapy, have coagulopathy, immunocompromised and allergies to leech therapy [19].

We have found leech therapy to be an effective way to manage venous congestion. Leech therapy is a cheap, safe and a well-documented method. We only used four leeches but this may be due to the venous congestion in a small area. The patients have to be tolerant of the leeches and so there is a degree of patient compliance for it to be an effective treatment modality

In our case, we achieved an optimal result with minimal disfigurement with the use of leech therapy in the management of venous congestion.

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