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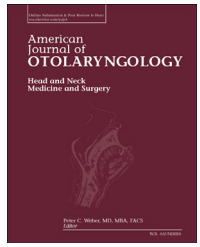

Current review

Reconstruction of upper lip avulsion after dog bite: Case report and review of literature☆,☆☆

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ABSTRACT

Importance: Upper lip avulsion after traumatic dog bite is a serious cause of facial disfigurement for which there is no consensus on management in the acute setting.
Objective: This review was prompted by a case at our institution and is intended to display the available evidence in the management of the patient after dog bite injury to the upper lip. Our main goals are to create a management algorithm using current evidence and to stimulate further clinical investigation to improve outcomes in patients with facial dog bite injuries.
Evidence Review: A review of English literature was performed using Pubmed/MEDLINE for case reports and case series of lip replantation using microvascular anastomosis. Additional review of hyperbaric oxygen therapy, medicinal leech therapy, lip reconstruction methods, and reapproximation was performed. Reference searches were performed for all retrieved articles.
Findings: Microvascular replantation is a successful method of acute management in dog bite injuries of the lip. Hyperbaric oxygen therapy and medicinal leech therapy improve outcomes. Immediate cross-lip flaps and immediate reapproximation are alternative techniques that can be performed in the acute setting, but further investigation is required.
Conclusions: The repair of the upper lip after a dog bite is a priority due to the functional and psychiatric sequelae associated with facial disfigurement. Microvascular replantation should be considered first-line. Immediate reapproximation without microvascular reanastomosis and immediate reconstruction may also be performed. A stepwise clinical algorithm may aid the surgeon in the acute management of dog bite trauma to the lip.

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1. Summary

A 30-year-old female presented to the Emory University Hospital Midtown emergency department with avulsion of the right upper lip from a dog bite. The avulsed tissue included white lip, vermillion border, and red lip but spared the columella and other nasal structures. No viable vessels were identified, and the avulsed tissue was reapproximated without reanastomosis of any vessels. Ultimately, the reapproximation failed and elective reconstruction was performed. This prompted an extensive review of the literature to generate a clinical guideline for the acute management of upper lip avulsion.

2. Introduction

Disfiguring trauma can lead to significant psychological stress, particularly trauma resulting in facial disfigurement. Studies have shown individuals with facial disfigurement have lower satisfaction with life, poorer perceptions of body image, and higher rates of alcoholism and depression [1]. Other causes of facial disfigurement can be equally distressing; surgical reconstruction for head and neck surgery has also been shown to be associated with depression [2]. As a result, addressing the issue of facial disfigurement is a priority in the care of patients with facial trauma.

Management of avulsed soft tissue can be accomplished in many ways. Blood supply, integrity of the dermis, and the presence of specialized dermis, such as fingertip, nail beds, eyelids, eyebrows, sole of foot, vermillion of lip, and glans penis, in the wound are essential to the successful management of avulsed tissue [3]. Avulsion of a lip segment can involve epidermis, dermis, underlying perioral facial musculature, and labial mucosa. According to Lehr and Fitts, there are five general methods of managing avulsed tissue: 1) debridement alone, 2) debridement and excision of the avulsed tissue with primary or secondary closure of the wound, 3) debridement and excision of the avulsed tissue with the use of the excised tissue as a free graft for the wound closure, 4) debridement and excision of the avulsed tissue and the use of a split- or full-thickness skin graft to close the wound, and 5) debridement and excision of the avulsed tissue with the use of a pedicle flap to close the wound [3].

Unfortunately, the literature does not address stepwise management of full-thickness upper lip avulsion in the acute setting, although an algorithm focusing on microvascular replantation has been proposed [4]. This review is intended to compile and evaluate current evidence for the management of upper lip avulsion and to create a treatment algorithm to be used by clinicians to improve patient care.

3. Methods

A review of English literature was performed using Pubmed/MEDLINE for case reports and case series of lip replantation using microvascular anastomosis. Keywords used include a combination of the following: “lip replantation,” “microvascular reanastomosis,” “lip reconstruction,” “immediate reconstruction of lip,” “lip injury,” “dog bite,” and “lip avulsion.” All cases were reviewed for patient demographic information, patient presentation, management, and follow-up. Cases that did not describe patient presentation or management were not included. Literature addressing lip reapproximation and immediate reconstruction was also reviewed.

Review of adjuvant therapy in the management of lip avulsion was performed. Keywords used include a combination of the following: “hyperbaric oxygen therapy,” “head and neck injury,” “medicinal leech therapy,” “venous congestion,” and “soft tissue avulsion.” The pathophysiological and therapeutic aspects of hyperbaric oxygen therapy were addressed in the review. We also reviewed literature on medicinal leech therapy using cases of microvascular anastomosis, independent cases, experimental series, and reviews. Reference searches were performed manually for all retrieved articles to expand the scope of the review and to ensure that all available data were assessed.

4. Case Presentation

The patient is a 30-year-old Caucasian female who presented to the Emory University Hospital Midtown emergency

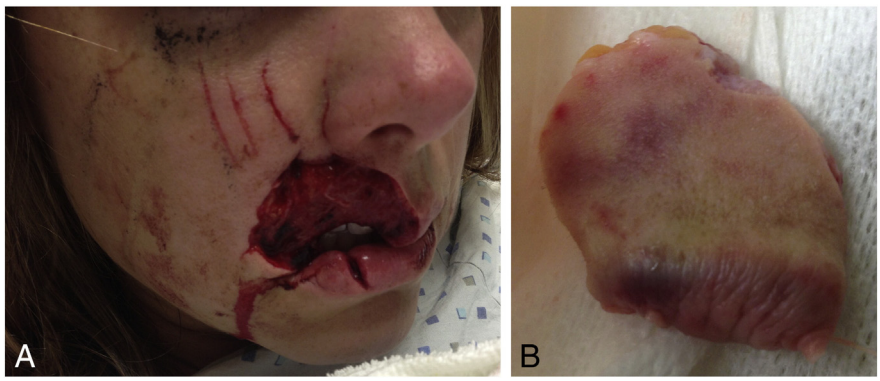

Fig. 1 – (A) Patient at presentation showing tissue bed and extent of injury. (B) Avulsed tissue with cleanly lacerated edges and preservation of vermillion border and red lip.