

# Navigating Complexities in Open Degloving Injury Reconstruction: A Case Study

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## Abstract

Airway obstruction, cervical spine injuries, and cranial structural injuries can worsen gross maxillofacial injuries, making them difficult to treat. Such injuries can cause deformities that have long-lasting psychological repercussions, which can be disastrous if left untreated. Here we have a 39-year-old male rider who was engaged in a motorcycle-truck traffic incident. He suffered avulsion and degloving of the right eyebrow, right upper and lower eyelids, right cheek, and a portion of the right cheek in addition to the triangle forehead skin. Following that, a one-stage primary reconstruction and repair were carried out. For this patient, a multidisciplinary team approach including many specializations had positive results.

**Keywords:** Degloving injury, road traffic accident, reconstructive surgery, maxillary fractures

## INTRODUCTION

Severe facial injuries can arise from high-speed motor vehicle collisions, assault, domestic violence, animal bites, and falls. Managing these injuries presents considerable challenges due to their potential for severe health impacts and even mortality. Extensive facial avulsion and degloving injuries caused by these mechanisms can lead to critical issues such as compromised airways, severe bleeding, loss of soft tissue, significant disfigurement, and subsequent changes in appearance and function after the trauma. Deformities resulting from such injuries can have enduring psychological effects that, if left unaddressed, can be devastating.<sup>[1-3]</sup>

Reconstructing intricate facial wounds presents significant hurdles for surgeons, as they must delicately balance achieving satisfactory cosmetic results with ensuring optimal functional recovery. Degloving lacerations illustrate severe soft tissue injuries where the skin and underlying tissues detach from muscles, bones, and fascia due to sudden shearing forces on the skin surface.<sup>[4-5]</sup>

Facial degloving injuries, while rare, pose distinctive challenges since there are no established treatment protocols.<sup>[6]</sup> Delayed treatment can worsen complications such as infection and necrotizing fasciitis of the avulsed tissue flap.<sup>[7]</sup> Moreover, damage to the flap's vascular supply can lead to complete necrosis of its full thickness.<sup>[8]</sup>

### Case Report

A 22-year-old man arrived at the emergency department of NIMS Multispeciality Hospital, Jaipur following a traffic accident. She sustained a degloving injury on the right side of her face, affecting the cheek, oral commissure, lower eyelid, and temporal scalp. Additionally, the external auditory canal, including the fibro-cartilaginous area, was severed distally.

Upon assessment, the patient had a clear airway and was breathing adequately. Fluids were administered to maintain circulation, and bleeding was controlled. He was alert and slightly oriented, and was not able to walk during the examination, he reported a brief loss of consciousness after the accident. Computed tomography revealed no signs of brain injury but identified a fracture in the right zygoma region. There were no indications of eye

injury, and her vision and pupillary reflexes were intact.[Figure-1]



**FIGURE 1**

The wound underwent thorough debridement using normal saline under general anaesthesia, with all non-viable tissues removed. The detached flap was meticulously repositioned and sutured to return the avulsed structures to their original positions. The external auditory canal, which had been detached, was carefully sutured back together. Layers of sutures were used to reposition and secure the lower eyelid. A postoperative dressing was applied to prevent hematoma formation. [Figure-2, Figure-3]



**FIGURE 2**



**FIGURE 3**

Following surgery, the patient was transferred to the general ward for observation and started on

antibiotics to prevent infection of the wound. Due to a zygoma fracture, the patient was placed on a soft diet. Plans were made for the patient to undergo open reduction and internal fixation of the zygoma fracture by trans-osseous wiring under general anaesthesia.

Unfortunately, the patient developed an infection in the avulsed flap the following day. As a result, the patient underwent debridement procedures until healthy granulation tissue was observed. Subsequently, the zygoma bone was stabilized using trans-osseous wiring, and a surgical drain was inserted at the site. [Figure-4, Figure-5]



**FIGURE 4**



**FIGURE 5**

## DISCUSSION

Degloving soft tissue injuries account for approximately 4% of all traumatic injuries and are more prevalent among males and younger patients. Motor vehicle accidents represent the primary cause of degloving injuries in the head and neck region.<sup>[9]</sup> These injuries can be categorized into open or closed lesions. Open degloving injuries typically involve soft tissue avulsion, while closed

injuries present as a cavity filled with hematoma and liquefied fat.<sup>[10]</sup> Open lacerations are more commonly observed in the head and neck area, whereas closed lesions are more frequent in the trunk and extremities.

The management of open degloving injuries varies from basic debridement with primary skin closure to intricate procedures involving skin grafts, local flaps, microvascular free flaps, replantation, or revascularization. The selection of treatment is guided by factors such as the location, size, and seriousness of the wound.

Vacuum-assisted wound closure is frequently employed for open degloving wounds to expedite the formation of granulation tissue before skin grafting.<sup>[11]</sup> However, achieving an airtight seal is challenging in the head and neck region due to the presence of multiple contours and hair.<sup>[12]</sup>

The primary approach to managing facial degloving injuries emphasizes achieving definitive primary skin coverage and facilitating early functional recovery. Despite meticulous wound debridement and closure, complications can still arise which includes infection and necrosis of flap.

The comprehensive management of extensive and overlapping facial avulsion and degloving wounds necessitates a multidisciplinary approach involving plastic surgeons, otorhinolaryngologists, oral and maxillofacial surgeons, and ophthalmologists who collaborate from the outset.

The collaborative approach ensures timely planning for specialized primary repairs, facilitating effective decision-making, and ultimately leading to favourable reconstructive outcomes.<sup>[13]</sup> Early, comprehensive reconstruction in a single stage has consistently demonstrated both functional and cosmetic benefits.<sup>[14-15]</sup> Wounds with contamination or embedded debris were meticulously cleaned, debrided, and repaired without delay, with a focus on preserving as much native tissue as possible to minimize infection risk and flap loss. This proactive strategy has consistently yielded superior results, including reduced infection rates, and improved cosmetic outcomes in soft tissue reconstruction efforts. Complications such as infection and skin necrosis can be caused by delay in the treatment of degloving injuries<sup>[16]</sup>

## CONCLUSION

Managing open degloving soft tissue injuries presents a challenge as there is currently no established evidence-based approach for their treatment. Successful management of these injuries necessitates a multidisciplinary approach. Properly

planning and staging surgical procedures are crucial to achieving optimal aesthetic and functional outcomes in such complex facial injuries.

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