Complications in Facial Trauma

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KEYWORDS

• Facial trauma • Complications • Orbit • Zygomaticomaxillary complex • Nasoorbitoethmoid • Mandible

KEY POINTS

- Intracranial and ocular injuries are common with severe facial fractures, and must be quickly identified and appropriately treated.
- Meticulous fracture reduction and implant placement are paramount in preventing postoperative complications.
- Complications of rigid fixation are typically due to fixation of inadequately reduced fractures.
- Close postoperative assessment allows for early recognition of complications, and provides the opportunity to intervene when necessary to achieve better long-term outcomes.

INTRODUCTION

Complications are common in the facial trauma setting, and there are several causes. All facial trauma surgeons should be knowledgable about potential associated intracranial and ocular injuries and how to prevent further morbidity. A multidisciplinary approach is often required, and early consultation with appropriate specialists is recommended. An understanding of common posttraumatic complications will guide surgical management. The most common complications of facial trauma are summarized in **Tables 1** and **2**.

SURGICAL COMPLICATIONS OF SOFT TISSUE AND VISCERA

Important overall tenets of facial trauma are to minimize scarring and prevent further injury to adjacent structures. The bony skeleton of the face protects multiple organs that are important to the functions of daily life. It is imperative that these organs are thoroughly evaluated at the initial presentation and the findings accurately documented. Scarring may be unavoidable, depending on the damage to soft tissue from the primary injury and/or location of the fractures and the access required for their repair. Lacerations should be copiously irrigated, minimally debrided, and closed primarily in a layered fashion.[1] Local skin flaps may be used to cover defects, if necessary. Hypertrophic or cosmetically unfavorable scars can be treated with dermabrasion, serial excision, or scar revision.

Brain injuries occur in up to 89% of patients with complex facial trauma.[2] All patients should be evaluated for potential involvement of the brain or cervical spine (**Table 3**), and an urgent neurosurgical consultation should be obtained for any positive findings. Traumatic brain injuries can be classified as closed, penetrating, and explosive blast injuries, with the severity based on the Glasgow Coma Scale.[3] Cerebrospinal fluid (CSF) leaks carry a 10% to 30% risk of developing meningitis, and can present acutely at the time of initial injury or in a delayed fashion.[4,5] Symptoms include persistent clear rhinorrhea or otorrhea, description of a salty taste in the mouth by the patient,

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Table 1
Complications of facial trauma: soft tissue and viscera

	Early	Late/Postoperative
Soft tissue	Infection/abscess Loss of soft tissue Unfavorable scarring	Scar contracture Facial deformity Infection/abscess
Brain	Dural laceration Cerebrospinal fluid (CSF) leak Hematoma (epidural, subdural, subarachnoid, intracerebral, intraventricular) Diffuse axonal injury Edema Traumatic brain injury Edema Concussion Foreign body	 Recurrent CSF leak Meningitis Brain abscess
Nasolacrimal apparatus	Lacrimal injury	Epiphora Dacrocystitis
Parotid gland	Hematoma Infection Sialocele Salivary fistula Abscess	Sialocele Salivary fistula Parotitis Chronic pain Frey syndrome Facial deformity
Eye	Traumatic optic neuropathy Retrobulbar hematoma Globe rupture Vision loss Diplopia Muscle entrapment Enophthalmos Corneal abrasion Superior orbital fissure syndrome Orbital emphysema Oculocardiac reflex (bradycardia) Blindness Sympathetic ophthalmia	Persistent diplopia Enophthalmos Exopthalmos Lower-lid malposition Exposure keratitis Blindness Sympathetic ophthalmia
Bone	 Fracture Bone loss	Delayed union Nonunion Malunion Infection/osteomyelitis
Dentition	Malocclusion Direct injury to tooth root Avulsion	Malocclusion Tooth loss Infection/abscess

headaches, or recurrent meningitis, and can be confirmed with a positive β2-transferrin test of collected fluid.[4] Most CSF leaks resulting from accidental and surgical trauma heal with conservative measures over the course of 7 to 10 days, although waiting for the leak to close spontaneously can increase the risk of meningitis, and close assessment to assure that complete resolution has occurred is necessary.[6] Surgical management includes exposure of the leak with primary repair or patch placement. Meningitis is treated aggressively with parenteral broad-spectrum antibiotics.

To prevent irreversible neurologic injury, spinal-cord injury should be suspected in all trauma patients until it is ruled out. Repair of facial fractures may initially be delayed while the patient is hemodynamically stabilized. If repair is performed before clearance of the cervical spine, it is imperative that the cervical spine remains in a neutral position. Closed reduction or external fixation techniques may be necessary to avoid injury to the spinal cord if access is inadequate.

Approximately 22% to 30% of orbital fractures have associated ocular injuries.[7] It is imperative