

When Past Trauma Meets the Present Injury: Surgical Management of Panfacial Trauma Fifteen Years After a Healed Depressed Frontal Bone Fracture

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Abstract:

Panfacial fractures are complicated fractures that include fractures of the upper, middle, and lower thirds of the face. These are generally a result of a high-energy injury. Their management requires meticulous planning, multidisciplinary cooperation, and adequate sequencing of fracture reduction. We present a case of a panfacial fracture after a road traffic accident (RTA), presenting with bilateral ear bleeding and altered consciousness (Glasgow Coma Scale [GCS] 12/15). The patient had a history of an RTA 15 years ago with a depressed frontal bone fracture treated conservatively. CT scan of the maxillofacial region showed fractures of the sphenozygomatic buttress, frontonasal region, bilateral condylar heads of the mandible, and parasymphysis of the mandible in addition to a history of a previously healed depressed frontal bone fracture. Definitive management of this patient was performed after neurological stabilization with GCS 15/15 using open reduction and internal fixation (ORIF) with restoration of occlusion and facial buttresses.

Keywords: Panfacial fracture, road traffic accident, condylar fracture, frontonasal fracture, sphenozygomatic fracture, ORIF

Introduction:

Panfacial fractures are considered to be fractures involving at least two thirds of the face, namely the upper, middle and lower thirds. High-energy mechanisms like road traffic accidents, falls from a height, and firearm injuries are the most common causes. They are often associated with traumatic brain injury and cervical spine injuries. The disruption of multiple facial buttresses presents a challenge for the restoration of facial symmetry, occlusion, orbital integrity, and airway function. Definite management of these fractures requires adherence to ATLS principles, thorough radiographic investigation, and surgical intervention as soon as the patient is hemodynamically and neurologically stable. Despite numerous sequences of management that have been described, management starting with mandibular continuity and occlusion reconstruction followed by midfacial reconstruction is the most popular. Here, we describe successful management of a panfacial fracture in a patient with a history of a depressed frontal bone fracture 15 years ago.

Case Report:

A 58-year-old male patient was transferred to our Emergency Department with a history of RTA. Upon admission, he had bilateral ear bleeding and altered sensorium with GCS 12/15 (E3V4M5). Patient was evaluated using ATLS principles. Airway was secure, respiration was normal, and hemodynamics were stable. Cervical spine immobilization was performed throughout the initial assessment. According to his relatives, the patient had a history of RTA approximately 15 years ago, resulting in a depressed frontal bone fracture that had been managed conservatively. No neurological deficits were found after the accident, and

he was asymptomatic since then. After stabilization of the condition, a non-contrast brain CT scan and a three-dimensional CT of the maxillofacial skeleton were performed. Imaging revealed a previously healed depressed frontal bone deformity and acute fractures of the frontonasal region, sphenozygomatic buttress, bilateral condylar heads of the mandible, and parasymphysis of the mandible. No acute intracranial hemorrhage or mass effect that required neurosurgical intervention was found.

Clinical examination revealed facial swelling, malocclusion, tenderness in the parasymphysis, restricted movements of the mandible, and flattened zygoma. The presence of bilateral ear bleeding made us suspect associated skull base trauma. However, no temporal bone fracture was found on radiographs. Ophthalmological examination ruled out any globe injury or visual impairment. The patient was admitted for further neurological observation. Once the consciousness returned and the patient was fully oriented, definite surgical management was planned in cooperation with the neurosurgical team.

Under general anesthesia with tracheostomy, ORIF of the panfacial fractures was performed. The fracture of the parasymphysis was exposed via intraoral vestibular incision, anatomically reduced and stabilized using titanium miniplates according to Champy's principles. Temporary maxillomandibular fixation was performed to restore the pretraumatic occlusion. Then, a bicoronal incision was made for midface reconstruction along with depressed frontal bone recontouring. Frontonasal fracture was reduced and fixed with low-profile titanium plates using the proper surgical approach. Sphenozygomatic fracture was exposed via standard facial approaches, anatomically reduced and fixed to restore the width and projection of the cheekbone. Bilateral condylar fractures were treated with Delta plates. Stable occlusion and satisfactory facial symmetry were confirmed before wound closure.

The postoperative period was uneventful. The patient received intravenous antibiotics, analgesia, corticosteroids, and oral hygiene measures. Maxillomandibular fixation was removed according to the institutional protocol, and physiotherapy was initiated to restore mandibular movement. Follow-up showed satisfactory wound healing, restoration of occlusion, progressive increase of mouth opening and satisfactory facial symmetry without infection, facial nerve dysfunction and hardware complications. Postoperative CT confirmed the satisfactory reduction and fixation of all fractures.

Discussion:

Panfacial fractures are some of the most complicated injuries in oral and maxillofacial surgery due to their involvement of multiple facial buttresses and frequent association with neurologic injury. Road traffic accidents remain the leading cause of these fractures in developing countries.

The initial management of panfacial trauma should include the protection of the airway, hemodynamic and neurological stabilization, as well as hemorrhage control. Alterations of consciousness, as seen in the presented patient (GCS 12/15), require meticulous neurological observation before reconstruction. Three-dimensional CT scan is still considered the best imaging method since it allows for identification of fracture pattern and surgical planning. In the presented patient, CT scan revealed not only acute fractures, but also the previously healed depressed frontal bone fracture 15 years ago.

It is important to be aware of past injuries to distinguish chronic deformities from the new ones. There are many sequences of panfacial fracture management, including "top-down and outside-in" and "bottom-up and inside-out". At present, there is a trend to restore mandibular fractures first because it allows restoration of facial width, posterior height, and dental occlusion and provides a good basis for midfacial reconstruction. In the presented case, stabilization of the parasymphysis fracture and restoration of occlusion came before the frontonasal and sphenozygomatic fracture fixation, allowing us to restore satisfactory anatomical relation. Treatment of the bilateral condylar fractures remains a matter of debate. Open reduction provides the best anatomical results for selected fractures, while conservative treatment with functional rehabilitation can also provide good results in the minimally displaced fractures.

Thus, it is necessary to make an individual decision taking into account fracture pattern, occlusion, ramus height, and the surgeon's experience. The previously injured frontal bone did not complicate the surgical management of this case, since it had already been healed without any neurological consequences. This emphasizes that the remote craniofacial injury does not complicate the management of a later one, provided proper imaging and a multidisciplinary approach are performed. Titanium miniplate rigid fixation has become the gold standard of maxillofacial surgery because it allows precise anatomical restoration, early mobilization, and predictable healing. Physiotherapy plays the most important role in patients with condylar fractures to reduce temporomandibular joint stiffness and improve functional outcomes.

Thus, successful treatment of panfacial fractures requires coordinated multidisciplinary management, including oral and maxillofacial surgeons, neurosurgeons, otolaryngologists, anesthesiologists, and ophthalmologists if needed.

Conclusion:

Panfacial fractures are among the most difficult maxillofacial injuries because of the complexity of restoration of facial anatomy and function. Thorough trauma assessment, three-dimensional CT imaging, multidisciplinary cooperation and appropriate surgical sequence are the key aspects for successful management. In this patient, definitive surgery following neurological stabilization allowed restoration of facial symmetry, stable occlusion, and good functional results despite the history of a previous depressed frontal bone fracture.

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