

X. Systematic Approach to Panfacial Fractures

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Maxillofacial trauma patients presenting with panfacial fractures are generally victims of high-velocity impact. As such, concomitant intracranial and multisystem injuries are frequently seen. These associated injuries often will preclude definitive facial fracture treatment until the patient has been fully stabilized, and any life-threatening or organ-threatening injuries have been resolved.

Patients presenting with panfacial fractures will manifest a unique spectrum of specific injuries. Many of these injuries may be ascertained by preoperative physical examination and radiographic analysis. However, the full magnitude of injury in each specific area is often not fully appreciated until the time of fracture fixation.

A systematic approach to these initially daunting fractures is required in order to maximize the restoration of form and function that may be attained. Note should be made of the fact that intraoperative assessment of the need for bone grafts often is required. Bone grafting is required when extensive comminution is present or when an osseous defect of 1 cm or greater is present in the vertical buttress, orbital rim or floor. Thus, informed consent in these patients should routinely include the possible need for harvesting bone grafts (calvarium, iliac crest, or rib).

The basic principle of panfacial fracture fixation is the re-establishment of premorbid occlusion and the restoration of proper midfacial anterior projection and width in relation to the skull base and frontal bar region above and the mandible below (Table 1). In addition, in fracture stabilization, one should always proceed from stable areas to unstable areas. The most important initial step to these fractures is the re-establishment of the patient's premorbid occlusion. Proper placement of maxillomandibular fixation (MMF) will necessarily require fixation of associated palate fractures and reduction (often with the use of disimpaction forceps) of any maxillary fractures (Table 2). All fracture sites should at this point be fully visualized by performing all required access incisions and soft tissue approaches. This will allow complete initial assessment of the degree of comminution and displacement present at each of the fracture sites. It will also allow for ongoing evaluation of the effects that reducing one site will have on adjacent areas. Access incisions should be closed only after all fractures have been stabilized at the completion of the operation.

Mandible fractures in the dentate areas of the mandible (dentulous patients) should be fixated prior to approaching angle, ramus, or subcondylar fractures, since this will allow for the maintenance of proper occlusal relationships while fixating the nondentate

TABLE 1

OVERALL SEQUENTIAL TREATMENT GOALS

Establish proper occlusion
ORIF mandible fractures
ORIF frontobasal fractures
Establish proper intercanthal distance
Establish proper midfacial height, width, and projection
Repair any orbital and nasal/septal fractures

areas of the lower jaw. Although controversy exists as to the indications for open reduction and internal fixation (ORIF), displaced bilateral subcondylar fractures may need ORIF in order to re-establish proper mandibular height.

Frontal sinus area fractures should be approached next, in order to establish a stable frontal bar region. Stability in both the frontal bar and the mandible regions is needed before proceeding to midfacial area stabilization.

Associated nasoethmoid fractures with traumatic telecanthus should be fixated before proceeding to maxillary or zygomatic fractures. This relates to the difficulty often encountered in sufficiently narrowing the intercanthal distance. If facial width is established first, it will be even more difficult to bring the intercanthal distance in to an acceptable level.

At this point, midfacial height and support should be restored by reconstitution of the medial and lateral vertical buttresses. Facial width and anterior projection complete midfacial reconstruction. Anterior projection of the midface is most importantly determined by the zygomatic arch. Proper three-dimensional restitution of comminuted arch fractures is difficult to fully achieve even with the broad exposure afforded by the extended coronal approach. Three-dimensional alignment of zygomatic fractures is best gauged by evaluation of the articulation of the greater wing of the sphenoid within the lateral wall of the orbit.

Orbital rim, floor, and nasal/septal fracture reduction and repair complete the surgical treatment of these patients.

At the conclusion of the procedure, one needs to determine the need for postoperative MMF. If solid bone-to-bone contact was achieved with rigid internal fixation at the level of the vertical buttresses and the mandible, then it may reasonably be expected that primary bone healing will occur at these fracture sites. MMF may thus be removed. On the other hand, if significant comminution or bone loss was present at these sites, then maintenance of MMF postoperatively would be prudent to allow for adequate restorative secondary bone healing to take place. This usually requires 2 to 4 weeks of fixation with well-nourished younger patients requiring the shorter duration and older patients with poor nutrition requiring longer MMF.

TABLE 2

UNIVERSAL TREATMENT ALGORITHM TO PANFACIAL FRACTURES

