

Unfavorable Occlusion after Facial Fracture Treatment



Fractures of the facial skeletal structures often involve the tooth-bearing region. Temporomandibular joint (TMJ) is the only visible, movable joint in the entire facial region. The teeth in the jaws, during function, come in immediate contact with each other during mastication, chewing food. Given the complex anatomy of each and every human tooth, any imperfections in such contact would reflect in the TMJ or the orofacial musculature. During development of facial structures including teeth, the muscles, bone, and teeth develop a functional harmony so that the resultant form and function are synchronized. In the absence of such synchronization, TMJ pathologies or orofacial musculature pain initiates.

In case of facial fractures, the bone and the attached muscles are repositioned during the trauma or the corrective surgical procedures. The new position may be favorable or unfavorable to the delicate occlusal-bone-joint-muscle harmony. If favorable or neutral, the patient does not suffer from any resultant problem. If unfavorable, there would be a variety of problems.^[1,2]

The most common complication of facial fractures is postoperative malocclusion.^[1] This can occur due to:

- Diagnostic errors
- Poor surgical technique
- Infection
- Healing disorders.

DIAGNOSTIC ERRORS

Improper assessment of fractures could lead to wrong, insufficient approach complicating the fixation method. Most of the issues could be related to the use of two-dimensional imaging modalities rather than using three-dimensional modalities, especially in complex fractures.

POOR SURGICAL TECHNIQUE

A technique that does not establish the pretrauma occlusion is destined to be failure. Fixation and trauma to nerves or achieving improper primary closure could lead to improper occlusion at latter stage.

Principle of facial trauma correction requires that pretrauma occlusion be obtained. For this, a surgeon should rely on old radiographs or casts or even the tooth wear patterns to identify the kind of occlusion. Care should be exerted while mobilizing the bone fragments and a proper intermaxillary fixation (IMF) procedure followed. The IMF should be done with proper pretrauma occlusion and shall be held stable throughout the fixation procedure. Care should be exercised not to use undue force during IMF or plating procedures.

In case of extensive loss of bone, grafts should be considered and no fracture should be left with deficient bone contact. Such a defect could facilitate mobility between fragments. Besides contributing to malocclusion, they may also predispose to nonunion, malunion/malocclusion, or facial asymmetry.

Understanding the biomechanics of the TMJ-bone-teeth-muscles is necessary to correct the trauma. An improper understanding may lead to late complications, compromising the occlusion at later stage of treatment. Internal fixation in the mandible should follow the proven principles of osteosynthesis accounting for the variety of vectors and the tensile, compressive, and torsional forces.^[3-6]

INFECTION

Early or late infection involving the fractured area could compromise on the bony approximation, leading to malunion causing malocclusion.

HEALING DISORDERS

It could be due to a variety of reasons ranging from systemic disorders, nutritional deficiencies to infections, improper oral hygiene maintenance, etc.

Post surgical malocclusion may produce significant reduction in Quality of Life, persistent pain, may require orthodontics and sometimes resurgery. Creation of pretrauma occlusion is the essential principle of surgical correction of fractures that one cannot afford to ignore.


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