Management Of Post Traumatic Residual Deformities: Case Report & Literature Review

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Abstract: New techniques of fracture management allow easy access to the whole craniofacial skeleton, accurate fracture reduction, internal fixation with mini and microplating systems and primary bone grafting where necessary to replace missing bone. The goal of primary treatment is to restore normal anatomy, form and function of the craniofacial complex. However, patients may present with post traumatic deformity for a various reasons. They may fail to present in the acute phase or injuries may go undiagnosed if specialist expertise is not available. Such deformities, after healing, are among the most formidable challenges faced by the surgeons, apart from the psychological impact on the patients. Symmetry is the key of proper reconstruction in general and face in particular. Our basic approach to the evaluation of deformities in the Department Of Oral & Maxillofacial Surgery and particularly techniques for their correction were presented.

Keywords: Facial Injury, Post Traumatic Defects, Malunion, Malocclusion, Corrective Osteotomy.

INTRODUCTION

Experienced surgeons recognize the challenge of restoring premorbid form and function to patients with established deformities after craniofacial trauma. The factors that lead to persistent deformities after craniofacial trauma include severe comminution (especially that which requires bone grafting), lack of definitive treatment, delayed initial treatment, and inadequate initial surgical repair. Malpositioned or missing skeletal fragments provide a faulty foundation and disrupt the harmony of the overlying soft tissues. Weak bony support will lead to the collapse and loss of soft tissue volume. Successful management lies on the surgeon's ability to distill the disfigurement to its individual components. In addition, proper facial projection and height must be reestablished. Systematic evaluation of the midface, including position of the globes, orbits, zygomatic (facial) width, and occlusion, is of utmost important. Some contour deficiencies can be camouflaged by relatively simple procedures, whereas some deformities may require osteotomies and repositioning of the displaced segments. As a rule, the need for refracture and repositioning increases with the severity of malposition. The perfect replacements in these cases are the tissues that are identical to the missing or deformed tissue.

Disfiguring post-traumatic deformities of the midface sometimes persist even after the treatment. Such deformities, after healing, are among the most formidable challenges faced by the surgeons, apart from the psychological impact on the patients. These deformities included depressed forehead deformity and temporal hollowing in the upper part of the face, malar malposition, enophthalmos, nasal deformity, and telecanthus in the middle part of the face, and malocclusion related to occlusal problems and temporomandibular joint ankylosis in the lower part of the face.

In Department Of Oral & Maxillofacial Surgery we have encountered two cases of post traumatic residual deformity of zygomatic arch and zygomatico maxillary complex fracture. Clinically, deformities of the middle and lower third of face ranges from dentoalveolar discrepancy (malocclusion) to severe facial asymmetry. Facial disfigurement causes social embarrassment and compromised masticatory and speech function. It often has a severe impact on the patients self esteem and affects the quality of life.

CLASSIFICATION

There is no entirely satisfactory system for classification of posttraumatic facial deformity which incorporates the necessary mix of hard and soft tissue deficits or takes account of resultant esthetic or functional difficulties.
Tessier proposed a system based on the major esthetic aspects of the disfigurement and included an orbital syndrome with entopthalmos, a craniofacial syndrome including stigma of residual frontal and nasoethmoidal fractures, a maxillary syndrome with occlusal abnormalities, and a nasal syndrome characterized by naso-orbital dislocation. Other workers such as Manson and Gruss have devised systems related to the previous location of bone fractures, comprising frontobasilar, Le Fort I, II and III fractures of the maxilla, naso-orbitoethmoid, zygomatic, nasal, mandibular complex and panfacial deformity.

THE PRINCIPLES UNDERLYING MANAGEMENT OF SECONDARY POST TRAUMATIC SKELETAL DEFORMITY INCLUDE

Accurate assessment by history, clinical examination and special investigations like plain films, dental study models, photographs and CT or MR scanning, with three-dimensional stereolithographic modeling where appropriate, treatment planning, surgery, utilizing a variety of techniques for management of soft and hard tissue deficits or deformities, including osteotomies or bone grafting."

CASE REPORTS

CASE I:

A 29 year old patient reported to the Department of Oral and Maxillofacial Surgery with a chief complaint of facial asymmetry with difficulty in chewing and swallowing with history of RTA four month back. On clinical examination, the patient has gross facial asymmetry with depressed maxilla & deranged occlusion.

Le Fort I down fracture was carried out via a horseshoe shaped buccal sulcus degloving incision. Bone cuts of lateral nasal walls, lateral maxillary wall, zygomatic buttress, were carried out in a similar way to standard orthognathic surgery. The transpalveolar approach for Le Fort I osteotomy of Trimble (approach through existing upper third molar socket) was done which reduced the height of the vertical cut and increased the distance from the sphenopalatine fossa. This increased the safety margin. Following down fracture, the maxilla was mobilized. Any areas causing interference with establishment of the desired position of the maxilla were removed. The maxilla was then fixed with 2 mm. miniplates, at the piriform apertures and zygomatic buttresses. Once the maxilla was fixed, the intermaxillary fixation was removed in order to check the newly established dental occlusion. This was exactly as planned and achieved by gentle upward pressure on the chin point, insuring that no distraction of the mandibular condyles out of the glenoid fossae has occurred.

CASE II:

A 32 year old male patient reported to our department with history of trauma 3 months back. Patient has undergone surgical treatment of fractured frontozygomatic region, infraorbital rim, lateral wall of maxilla. Zygomatic arch fracture has not been treated which leads to deformity like prominent zygomatic arch and reduced mouth opening. CT scan (Fig.3) revealed fracture of left zygomatic arch. Fig.4 shows the initial mouth opening was 22 mm. With standard Alkayat Bramley incision, zygomatic arch was exposed. Osteotomy was done and fixed with 2 mm. stainless steel mini plates (Fig.5). Fig. 6 shows postoperative mouth opening achieved up to 39 mm.

DISCUSSION

Management of facial fractures requires definitive treatment planning and approach during primary surgery. Sir Harold Gillies (1968) divided post-traumatic facial deformities into those with substantial loss of tissue and those without. When there is no serious loss of tissue, residual deformities are due to failure in diagnose, i.e. to assess the nature and extent of the original injury, failure to disimpact or wholly replace displacements from such an injury and to provide adequate fixation."

Our case showed malunited fracture of the zygomatic arch which was not addressed during the primary surgery and malunited fractures of the maxilla which the patient had not taken any treatment after traumatic injury.

Unrepaired or inadequately reduced facial fractures can result in a wide range of cosmetic and functional deformities. Unrepaired injuries of the middle and lower face can cause contour deformities, flattening of the cheeks, or malocclusion of the teeth with chewing difficulty.

Late repair or reconstruction after the soft tissue and bones have healed is much more difficult than repair at the time of initial injury. Reconstruction requires wide exposure which enables the surgeon to have direct visualization of the bony deformities. Bone cuts are then made to reposition the displaced bone and reattach the soft tissue back into its normal position. Missing or severely deformed bone may require replacement with bone grafts. In the above two cases reconstruction has not been done due to minimal tissue loss."

OUTCOMES AFTER CORRECTION OF MAXILLOFACIAL POST TRAUMATIC DEFORMITIES

1. Psychological aspect

A person’s physical appearance is an important aspect in social interactions. It is not only the individuals own perception of appearance which not only contributes to the psychosocial effects but also the reaction of others. To improve facial aesthetic is the most powerful motivating factor leading people for surgical correction. High degree of satisfaction has been reported following orthognathic surgery is in contrast to several studies involving corrective surgery.
2. Masticatory Function

The alignment of maxillo mandibular relationships often results in improved mastication.

3. Temporo mandibular joints

Temporomandibular joint dysfunction (TMD) is one of the most common causes of facial pain with different types of maxillofacial deformities. Hence surgery should always be considered in patients with chronic facial pain resulting from TMJ dysfunction in association with dentofacial deformities.

4. Stability

It is important to organize a complete treatment plan including all the morphological and functional abnormalities which are present and arrive at a corrected position of facial skeleton which not only satisfy aesthetic and functional criteria but will also be stable. The improvement in different surgical technique and methods of fixation, and understanding of the effects of soft tissue environment on the facial skeleton have succeeded achieving more predictable results. The stability of the repositioned bone fragments depends on the types of skeleton pattern and the type of surgery performed.

POSSIBLE COMPLICATIONS

Many intra operative and post operative complications has been noticed, like oedema, haemorrhage, pain, fragmentation of the bone segments, relapse, bone necrosis, infection, delayed or malunion, disturbance of the inferior alveolar nerve or infraorbital nerves and other unexplained nerve injuries.

CONCLUSION

Jaw deformities may cause pain, dysfunction, excessive tooth wear, difficulty in mastication, speaking, or breathing. Many people live with these problems all their lives, but there is an alternative. Restoring the proper anatomic relationship of the upper and lower jaw helps to reestablish normal function and protect against further deterioration of the teeth and the TMJs. Maxillofacial surgery can help resolve these problems and improve a person’s comfort and self-esteem, allowing him or her to live a happier and healthier life.

REFERENCES


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LIST OF PHOTOGRAPHS

Fig.1. High Lefort I Osteotomy
Fig.2. Fixation with 2 mm. Miniplates
Fig.3. 3D CT shows old Lefort I fracture

Fig.4 Initial mouth opening
Fig.5 Fixation Of Zygomatic arch
Fig.6. Increased mouth opening