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A RANDOMIZED STUDY TO REVEAL THE VARIOUS TREATMENT METHODS FOR MIDFACIAL FRACTURES IN PUNJAB DENTAL HOSPITAL

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Abstract:

Objective: *The aim of this study was to determine the anaotomical distribution of the mid-face fractures and different treatment modalities.*

Study design: *A randomized study.*

Location and duration: *In the Oral and Maxillofacial Surgery Department of Punjab Dental Hospital, Lahore for one year duration from July 2017 to June 2018.*

Methods: *90 consecutive patients with moderate facial fractures were treated in the Department of Oral and Maxillofacial Surgery. Clinical histories and radiographs of the patients were reviewed. We reviewed the data on the anatomical region and treatment modalities.*

Results: *Zygomatic bone was the most affected (64.71%), maxilla (28.43%), nasal bone (3.92%) and nasoethmoidal fractures (2.94%). Le Fort I was most often broken. Maxillary fractures were mainly treated with suspension wires (31%), whereas the management method for zygomatic complex fractures (ZC) was Gillies approach (37.9%). The fixation of the miniplets was performed in 20.7% and 13.6% of maxillary fractures and ZC cases, respectively.*

Conclusion: *Le Fort I was the most common fracture between maxillary fractures. The fractures of the middle face were treated with internal and open reduction with or without hard internal fixation. Therefore, the advantage and efficiency need more work than the cost of comparing the miniplates with conventional methods.*

Key words: *Trauma, facial fractures, mid-face fractures, maxillary fractures, zygomatic fractures.*

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INTRODUCTION:

Maxilla, zygoma, lacrimal, nasal, palatal, lower nasal and vomer bones are collectively referred to as the middle third of the facial skeleton. When the mid-face region is injured, the most frequent facial fractures are followed by the maxilla and then the ZC and alveolar process. Some authors have reported that zygoma is a more sensitive bone than maxilla. The fracture may include two or more facial bone combinations. In recent years, significant advances have been made in the treatment of mid-face fractures in both surgical techniques and stabilization and fixation materials. The use of mini and microplates greatly improved treatment strategies. They are readily accepted and stabilized in favor of correcting the skeletal facial movements, correcting a good dental occlusion and correcting the three-dimensional facial projection. Mini-plates in absorbable materials are more advantageous than mini-micro titanium plates which are not suitable for use in pediatric patients because they interfere with craniofacial growth. They also interfere with CT and MRI. They may also cause problems in oncological diseases requiring radiotherapy treatment. Absorbent materials reduce the risk of inflammatory complications in the short and long term after the rejection of a titanium implant requiring extraction of these devices. The aim of this study was to determine the anatomical distribution in the treatment of fractures in the middle of the face and to analyze different treatment strategies.

MATERIALS AND METHODS:

This randomized study was held In the Oral and Maxillofacial Surgery Department of Punjab Dental Hospital, Lahore for one year duration from July 2017 to June 2018. The information obtained is based on the analysis of the average facial lesions recorded in the Department of Oral and Maxillofacial Surgery. This randomized trial was performed in 90 consecutive patients who received a lesion in the middle of the face. All patients were included in this study. A detailed history of the patient was obtained and a complete clinical examination was performed. Then a specially designed detail form was completed. Basic research and specific research such as intraoral, 0PG (orthopantogram) radiographs; PNS (nasal sinuses), (100 and 300) and submentovertical were performed to confirm bone trauma. Fractures were classified according to standard terminology. An appropriate management plan has been designed and followed for 6 weeks. The mid-face fractures were compiled according to the anatomical region and treatment modalities.

RESULTS:

A total of 97 patients with mid-face 102 fractures with or without mandibular involvement were treated in our department. The most common bone fracture was zygomatic bone representing 66 cases (64.71%), 29 (28.43%) cases of maxilla fracture and nasal and naso-ethmoidal fractures in the 04 and 03 respectively. It is shown in **Table 1**.

	Number of cases	Total	Per-cent
Zygomatic Complex			
ZC alone	27		
ZC & Maxilla	05	66	64.71
ZC & Mandible	34		
Maxilla			
Maxilla alone	17	29	28.43
Maxilla & ZC	05		
Maxilla & Mandible	07		
Nasal bone	04	04	3.92
Naso-ethmoidal	03	03	2.94
Total		102	100

TABLE 1: DISTRIBUTION OF MIDFACIAL FRACTURES

	Number of cases	Percent
Le Fort I	10	34.5
Le Fort II	8	27.6
Maxillary dentoalveolar	7	24.1
Le Fort III	4	13.8
Total	29	100.0

TABLE 2: DISTRIBUTION OF MAXILLARY FRACTURES

The distribution of maxillary fractures **(Table 2)** was Le Fort I in 10 patients (34.5%), Le Fort II in 8 (27.6%), alveolar in 7 (24.1%) and Le Fort III in 4 (13.8%) patients. ZC fracture was broken in 57 (86.4%) of the 66 cases

and fracture in 9 (13.6%). Le Fort fractures were treated with circumzygomatic suspension wiring , miniplate fixation and interosseous fixation **(Table 3).**

	Number of cases	Percent
Suspension wiring with IMF	9	31.0
Interosseous wiring with IMF	7	24.1
Plane arch bar	7	24.1
Miniplate fixation with IMF	6	20.7
Total	29	100.0

TABLE 3: METHODS OF FIXATION FOR MAXILLARY FRACTURES

The majority of the Le Fort I fracture was managed with wire suspension (31%), open interosseous reduction in Le Fort II and Le Fort III (24.1%), and miniplat fixation (20, 7%). All these cases were supported by the IMF. However, the rigid internal fixation recommended early withdrawal of the IMF. The straight sidebar (half round wire) was used to treat maxillary dentoalveolar fractures. Twenty-five (37.9%) of the ZC fractures were reduced using Gillies temporal approach and 14 (21.2%) were treated with a transoral approach. Open reduction was performed in 21 cases (31.8%); 18.2% and 13.6% of these patients were treated with miniplate fixation and interosseous wiring, respectively. Only 6 cases (9.1%) were treated conservatively by observation alone, as shown in **Table 4.** In the nasal bone fracture, 2 cases were treated with a close reduction while an open reduction fracture **(Table 5).**

	Number of cases	Percent
Temporal fossa approach	25	37.9
Transoral approach	14	21.2
Open reduction with interosseous wiring	12	18.2
Open reduction with miniplates fixation	9	13.6
Conservative treatment	6	9.1
Total	66	100.0

TABLE 4: TREATMENT OF ZYGOMATIC COMPLEX FRACTURES

	Number of cases	Percent
Closed reduction with tape & plaster	2	50.0
Closed reduction with manipulation	1	25.0
Open reduction	1	25.0
Total	66	100.0

TABLE 5: TREATMENT OF NASAL FRACTURES

Open reduction was used to treat three nasoethmoidal fractures. The difference in the total number of fractures of the average face 102-97 = 7 is the total number of cases 97, but when combined fractures are added to the anatomical regions, the total number of fractures is 102. To avoid confusion, the term 'number of cases' is used.

DISCUSSION:

Our data in the fracture region shows little difference with the literature. The frequency during reduction is ZC, maxillary, nasal and nasoethmoidal. An explanation for this apparent investment in our unit may be nasal trauma corrected in local emergency units and NCDs, and reporting that there is no diagnosis of nasal fractures in children. This may lead to clinical interpretation of the fractures and errors in the image, in children, lacking in the missing nasal bone and the evident projection of the nose pyramid in the lack of experience of the examiner. Due to a similar situation, only small cranial radiographs may occur in the lower eyelid

wall and orbital floor fractures with small bone poor placement of the eyelid and the inflammation of the images that are not seen in the first hours after injury. In this case, the fracture may be difficult to see due to the superposition of the anatomical structures (orbital wall and temporal bone). According to Busuito et al. And Sherer et al., These faults in diagnosis do not occur with other facial fractures (mandibular). ZC was the most sensitive area. It coincides with views of Ajagbe, Daramola, Rowe and Killey, which reported that the mid-third of Zigoma's face is the most common of fractures. Among the maxillary fractures, Le fort I fractures were reported by Jair CM et al. Le fort II and III were apparently less. The main purpose of surgical treatment of fractures in the middle of the face is to eliminate the problems in the defects and to solve the functional deficits which concern the orbital structures. The secondary objective is to provide good dental occlusion in addition to the 3 D image of the face, the integrity of the nasal cavity and orbit, in addition to zygomatic alignment. This can be achieved until the tenth day after the trauma, without any negative consequences on the performance or success of the surgical operation. However, in the event of a trauma involving external eye muscles, surgery is mandatory 24-48 hours after trauma. In addition, treatment of fractures 20 days after trauma requires both aesthetic and functional osteotomy. We mainly use mini titanium plates in our series. In this study, 33 patients were treated with miniplate fixation. The low frequency of rigid internal fixation is due to poor economic conditions of the patients and simple fixation methods give satisfactory results. However, the advantage and efficiency require more work compared to the cost of fixing miniplates.

CONCLUSION:

ZC was the most sensitive bone (64.71%), followed by maxilla, nasal and nazoethmoidal. Le Fort I was the most common fracture between maxillary fractures. The fractures of the middle face were treated with internal and open reduction with or without hard internal fixation. In open reduction, transosseous wiring or mini plate fixation was performed. The patient's poor economic conditions limited internal rigid fixation cases. However, the results were satisfactory in all methods. Therefore, the advantage and efficiency need more work than the cost of comparing the miniplates with conventional methods.

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