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# ISOLATED ZYGOMATIC BONE FRACTURE: ASSESSMENT OF OUTCOME BY TWO POINT FIXATION.

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**ABSTRACT… Objectives:** The purpose of the present study was to assess the outcome of two-point fixation in isolated zygomatic bone fracture. **Study Design:** Descriptive study. **Setting:** Department of Oral & Maxillofacial Surgery, Faculty of Dentistry, LUMHS, Jamshoro/Hyderabad. **Period:** 1/3/2018 to 31/8/2018. **Material & Methods:** Consisted of 46 patients with displaced isolated zygomatic bone fractures. All fractures were treated by reduction with transoral (Keen's) approach & fixation was done by two point fixation with titanium miniplates. Patient was discharged from the hospital next day & advised follow-up after two weeks. Mean ± St & ard deviation was computed for qualitative variables. Diplopia was described in frequencies. Mouth opening was measured on 7th day or 1 month & measured in 1mm by metallic ruler. T-test was applied to find the P Value. **Results:** There were 34 male & 12 female patients. 56.5% injuries were caused by road traffic accident. Mean mouth opening at 1st week was 25.23±5.15mm & at 2nd week was 38.75±2.00 mm. At 1st week diplopia was found in 26.1% subjects while at 2nd week, diplopia was found in 10.9% subjects. There was significant difference in mean mouth opening at 1st week with 2nd week. The results also showed significant association of diplopia at 1st week with 2nd week. **Conclusion:** isolated zygomatic fractures can be reduced & immobilized by two-point fixation with screws & titanium mini bone plates at frontozygomatic & the zygomatic buttress area. Post-operative complications i.e. opening of mouth & diplopia were suggestively decreased afterward 15 days of treatment.

**Key words:** Isolated Zygomatic Bone Fracture, Outcome, Two Point Fixation.

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## INTRODUCTION

The zygoma plays an important role in the facial contour for both cosmetic and functional reasons; therefore zygomatic bone injuries should be properly diagnosed and adequately treated[1].Because of its position, it is the second most common mid-facial bone fractured after the nasal bones and overall represents 13% of all craniofacial fractures.[1,2]

The high frequency of zygomatic bone fracture is because zygoma occupy prominent position in the facial skeleton which frequently exposes it to traumatic forces.[3] The shape of zygoma is roughly quadrilateral, with an outer convex surface and an inner concave surface.[3,4] The convexity forms the point of greatest prominence of the cheek therefore the zygoma plays a major role in facial contour, and disruption of zygomatic bone carries a risk of functional and aesthetic impairment.[4]

The causes of the fracture are mainly attributed to assault and road traffic accidents (RTA), which is inconsistent with worldwide experience.[5] However, in many places, either road traffic accidents was consistently the main contributing factor in developing countries.[6] Industrial, Sports injuries, fall and FAI (Fire Arm Injury) and inter personal violence are other causes.[7]

The fracture of the zygomatic bone can cause restricted mouth opening due to impingement on the coronoid process.[8] The important clinical features of isolated zygomatic bone fractures are flattening of normal malar prominence, lid drop and eye movement limited or with double

vision, numbness of cheek area and unilateral epistaxis.[8,9] Disruption of the zygomatic position also carries psychological, aesthetic and functional significance, causing impairment of occular and mandibular function.[10] Therefore, for both cosmetic and functional reasons, it is mandatory that zygomatic bone injury is properly diagnosed and adequately managed.[7]

As with any fracture proper diagnosis is mandatory so diagnosis of isolated zygomatic fracture can be made by clinical and radio-graphical examination.[9,10] Various surgical techniques have been described for the reduction of zygomatic bone fracture.[8] Open reduction with surgical incisions has been accomplished through Keen's approach, Gillies' approach, bicoronal scalp flap approach or the more popular Dingmans's approach.[11] Gillies' approach is the temporal approach. This procedure has advantages in that it leaves no facial scars and is simple to perform. The Gillies temporal approach method is used widely in UK for zygomatic bone fracture.[11]

For good functional stability and esthetics, the isolated zygomatic bone fracture are correctly reduce and fix with miniplates, for that two point fixation is sufficient to maintain the good functional esthetical result. The purpose of this study is to manage the isolated zygomatic bone fracture by two point fixation to maintain and secure the facial aesthetic and functional stability.

## MATERIAL AND METHODS

### Sample Size

The sample size calculated was 46. The results of this study are valid as confirmed by sample size calculation using WHO software for sample size calculation.

Where $\alpha = 0.05$, $1- = 90$, $P_0 = 0.60$, $P_a = 0.85$, n (sample size) = 46

### Inclusion Criteria

- Displaced Isolated Zygomatic Bone fractures confirmed on clinically & radiologic features.
- Patients above the age of 18 years.
- Patients willing to participate in this study.

### Exclusion Criteria

- Bilateral displaced fractures of zygomatic bone fractures.
- Associated injuries which are likely to delay early open reduction & internal fixation of the zygomatic complex.
- Medically compromised patient.
- Patients has pathologic zygomatic fracture.

### Data Collection Procedure

After ethical approval patients meeting the inclusion criteria, came through Out Patient Department or Emergency Department were involved in the study. A written consent was obtained from every patient or attendant of the patient. Diagnosis of isolated zygomatic complex fractures was done on the basis of clinical examination & radiographic evaluation with at least two radiographs i.e. Occipit-mental view 15 degree, & Sub-Mento vertex view. All fractures were treated by reduction with transoral (Keen's) approach & fixation was done by two point fixation with titanium miniplates.

## RESULTS

The results presented were 34 male & 12 female patients. The frequency distribution was presented in Table-I.

| | Frequency (n) | % |
|---|---|---|
| Male | 34 | 73.9 |
| Female | 12 | 26.1 |
| Total | 46 | |

**Table-I. Frequency of patients according to gender (n=46).**

The overall mean age of study subjects was 28.39±6.11 years. The age was further stratified in two groups. The frequency & percentage of patients among these groups are presented in Figure-1.

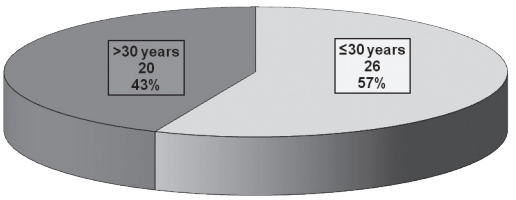


**Figure-1: Percentage of patients according to age groups (n=46).**

56.5% injuries were caused by road traffic accident (RTA), 19.6% by fall, 10.9% by sports & 13% were caused in result of assault as presented in Table-II. In our study the overall mean mouth opening at 1st week was 25.23±5.15 mm & mean mouth opening at 2nd week was 38.75±2.00 mm. The detailed descriptive statistics of mouth opening at 1st week & at 2nd week and according to cause of injury are presented in Table-III & IV.

| | Frequency (n) | % |
|---|---|---|
| RTA | 26 | 56.5 |
| Fall | 9 | 19.6 |
| Sports Injury | 5 | 10.9 |
| Assault | 6 | 13.0 |
| Total | 46 | |

**Table-II. Frequency of patients according to cause (n=46).**

| | Mean | SD | P-Value |
|---|---|---|---|
| 1st Week | 25.23 | 5.15 | 0.000* |
| 2nd Week | 38.75 | 2.00 | |

**Table-III. Comparison of mean mouth opening at 1st week & 2nd week (n=46).**

Dependent t-test was applied.
P-value ≤0.05 considered as Significant
*Significant at 0.05 levels.

| | | Mean | SD | P-Value |
|---|---|---|---|---|
| RTA | 1st Week | 24.70 | 5.49 | 0.000* |
| | 2nd Week | 38.55 | 2.38 | |
| FALL | 1st Week | 24.78 | 1.79 | 0.000* |
| | 2nd Week | 39.20 | 1.30 | |
| Sports Injury | 1st Week | 28.88 | 6.73 | 0.015* |
| | 2nd Week | 38.70 | 1.82 | |
| Assault | 1st Week | 25.15 | 5.60 | 0.001* |
| | 2nd Week | 39.05 | 1.27 | |

**Table-IV. Comparison of mean mouth opening at 1st week & 2nd week according to cause of injury (n=46).**

Dependent t-test was applied.
P-value ≤0.05 considered as Significant
*Significant at 0.05 levels.

At 1st week diplopia was found in 26.1% study subjects while at 2nd week, diplopia was found in 10.9% study subjects as presented in Table-V.

The results also showed significant association of diplopia at 1st week with diplopia at 2nd week (p=0.001) as presented in Table-V.

| | Yes | No | Total | P-Value |
|---|---|---|---|---|
| Diplopia at 1st Week | 12 | 34 | 46 | 0.001* |
| Diplopia at 2nd Week | 05 | 41 | 46 | 0.001* |

**Table-V. Frequency & association of diplopia at 1st week with diplopia at 2nd week (n=46).**

Chi Square Test was applied.
P-value ≤0.05 was considered as significant
*Significant at 0.05.

## DISCUSSION

The zygoma or malar complex forms the central support of cheek and is a strong buttress of lateral portion of middle third of facial skeleton. Patterns of zygomatic bone fractures range from simple fracture to comminute and from minimally displaced to severely displace.

In this study males were predominantly affected as compared to females. Males found to have isolated zygomatic bone fracture were 73.9%. This male predominance in this study is also favored by the study of Adam AAD[12] who reported 80% of males in same type of study.

The zygomatic bone fracture usually encountered in adult individuals that is more than 30 years of age group. In this we have found the same results. Most of the patients were over 30years of age i.e is around 57%. The study carried out by Iqbal HA[13] also supported our data where he found mean age range of 30years. Another study of Rana M et al[14] also shows the mean age range of over 30 years.

Well developed countries of the world have shown decline in road traffic accidents. However, in this study RTA was the most common etiological factor seen 56.5%. Studies of various authors like Ashwin DP[15], Obuekwe O[16] also shows high percentages of road traffic accidents in such type of trauma.

In this study most common preoperative findings were limited mouth opening and diplopia. There

was gradual increase in mouth opening as compared on follow up at 1 week and 2 week time. There was almost 13% increase in mouth opening at 2nd week follow up as compared to 1st week. Mean mouth opening at 2nd week was found as 38.5%. Diplopia was also gradually decreased in 2nd week as compared to 1st week.

## CONCLUSION

This study accomplishes that two-point fixation is effective & nonviolent process for the fixation of isolated zygomatic bone fracture.



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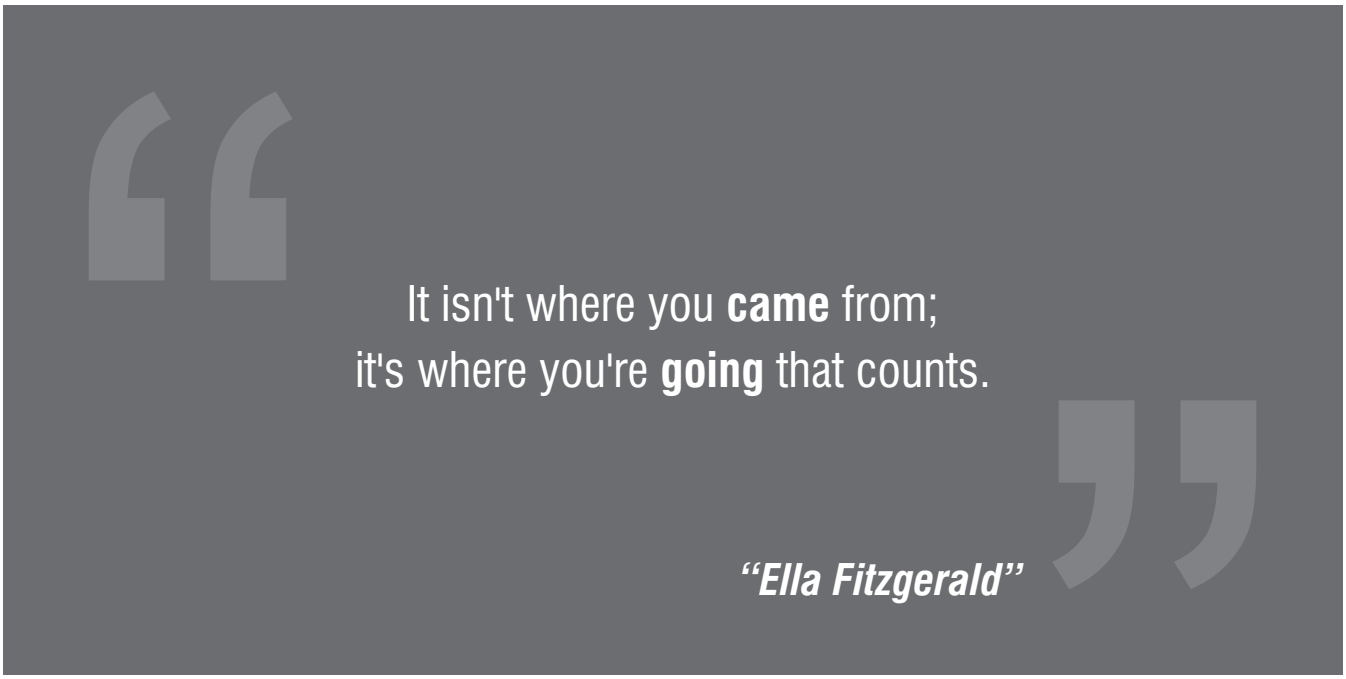


## AUTHORSHIP AND CONTRIBUTION DECLARATION

| Sr. # | Author(s) Full Name | Contribution to the paper | Author(s) Signature |
|---|---|---|---|
| 1 | Khushboo Abdullah | Principal author, Data collection. | |
| 2 | Muhammad Shahzad | Results. | |
| 3 | Abdul Wahid Bhangwar | Data collection. | |
| 4 | Syed Ghazanfar Hassan | Manuscript designing, References. | |
| 5 | Suneel Kumar Panjabi | Duscussion & Proof Read. | |