

ORIGINAL ARTICLE

Frequency of Infra Orbital Nerve Recovery after Open Reduction Internal Fixation of Zygomatico Maxillary FractureHINA JABEEN¹, TARIQ SARDAR², ERUM RIAZ³, ASHFAQ AHMED⁴, ASFANDYAR LUNI⁵, HAFIZ MUJTABA HUSSAIN⁶¹Senior Registrar, Department of oral and maxillofacial surgery, Bahria University and dental hospital, Karachi²Assistant Professor, Department of Oral and Maxillofacial Surgery, KMU-Institute of Dental Sciences, Kohat³Post graduate resident (FCPS), Department of Oral and maxillofacial surgery, Foundation University College of dentistry and hospital, Islamabad⁴Post graduate resident (FCPS), Department of Oral and maxillofacial surgery, Ziauddin University Hospital Clifton campus Karachi⁵Dental surgeon, DHQ hospital Loralai⁶Post graduate resident (FCPS), Department of Oral and maxillofacial surgery, Ziauddin University Hospital Clifton campus KarachiCorresponding author: Hina Jabeen, Email: Dr.hina.jabeen@gmail.com**ABSTRACT****Objective:** The current research aimed to assess the repositioning frequency of infraorbital nerve paresthesia after open reduction internal fixation in the treatment of ZMC fractures.**Methodology:** Randomized control trial was conducted in department of Oral and Maxillofacial Surgery, Ziauddin hospital and Medical University, Karachi from Jan 2020 to July 2021. Data was collected after ethical approval. Patients with unilateral zygomatico maxillary bone fracture satisfying the exclusion and inclusion criteria, and who were ready to give knowledgeable approval after the given explanation about study procedure, how data taken from their cases will be used for research purpose, and after discussion on risk as well as benefits of the procedure, were involved in our study.**Results:** Data of 150 patients were collected. Out of these 150, 82 were and females 68 were male. The mean age (SD) was 31.48 (5.67 SD) years. Other socio-demographic characteristics are represented in table 1. 106 (71%) of ZMC patients recovered from infra orbital nerve after Open Reduction**Conclusions:** On the basis of this study it is recommended that open reduction as chosen mode of management whose outcomes in enhanced recovery of functional nerve amongst paresthesia patients after linked to closed reduction approaches.**Keywords:** Infra Orbital Nerve, Zygomatico Maxillary Complex (ZMC)**INTRODUCTION**

The structural eminence of zygomatic maxillary complex in the facial bones is the commonest causes for trauma creating 45% of all mid facial and 25% of all ruptures of facial populace.¹The most frequent cause of ZMC fractures are road traffic accidents. Youngsters with motorbike mishaps are acknowledged as the frequently source (25.7%) trailed by car accidents (20.1%). Personal fierceness founds 15.3% whereas collapse caused by old age 12.5%, bicycle misfortunes 8.7%, sports accidents 7.1%, automobile-pedestrian impacts 4.9%, work associated wounds 3.1% and other reasons 4.86%.² The most common sign of orbito-zygomatic complex fractures are periorbital edema and ecchymosis. Other signs/symptoms include depression of the malar eminence, sub conjunctival hemorrhage, & sensory loss in dispersal of infraorbital nerves.³ Further indication of zygomatic fractures are exophthalmos, reduced ocular movement, binocular diplopia, dystopia, anti- mongoloid slant of lateral canthus as well as tangible steps nearby the orbital buttress & rim. Restricted mouth opening might existing when the arch is broke obstructing on the coronoid course or due to the muscle injury.³

Frequency of infraorbital nerve damage due to ZMC fractures varies from 17.5-82.7%.⁴ Infraorbital nerve is frequently intrigued in ZMC fractures since fracture line comprises infraorbital fissure, foramen or canal in 94.5% of cases.⁵ Sensory modification of infraorbital nerve formed by ZMC fractures comprise paresthesia dysesthesia, hypoesthesia and anesthesia of inferior eyelid, cheek, skin of nose, anterior gum, upper lip, and teeth of pretentious side.^{6, 7} ZMC fractures existing through diverse outlines. Several forms can be cured by dissimilar surgical methods grounded on type, nature and extent, surgeon expertise and patient's limitation. Each procedure has its own limitations and advantages.⁸ Open reduction with miniplate osteosynthesis offers improved fixation but is time overwhelming, expensive & frequently finishes with protuberant facial marks.⁹ Neurosensory shortages afterward such fractures reconcile over an era of time. Established on time period curative required, paresthesia is classified as "mild moderate and severe". Nerve injury is categorized established on time period of nerve retrieval post operatively. Mild nerve injury recuperates inside sixty days and moderate takes as long as a year.^{9, 10}

Surgical approaches which are open reduction and closed reduction internal fixation, are required when there is displacement of fractured bone.¹¹ Open reduction with miniplate osteo synthesis

is expensive, time utilizing and often results in post-operative noticeable facial scars. But on other hands it gives better fixation than closed reduction.¹²

The purpose of the current research was to check the retrieval frequency of infraorbital nerve paresthesia subsequent open reduction internal fixation in the treatment of ZMC fractures.

METHODOLOGY

This was Randomize control trial conducted at department of Oral and Maxillofacial Surgery, Ziauddin hospital and Medical University, Karachi after approval from ethical review committee from January 2020 to July 2021. Sample size 150 was assessed using 95% confidence level 80% power of test with probable recovery of infra orbital nerve in open Reduction and Internal Fixation 74%.¹³ Data was collected through Non-probability consecutively sampling method.

Inclusion Criteria: Patients with remote uni-lateral zygomatico maxillary bone fracture diagnosed on waters view and 3D CT Scan having fracture line running through zygomatico maxillary suture, frontozygomatic suture, depression of zygomatic bone and paresthesia of area supplied by infra orbital nerve assessed clinically by two point discrimination test and teeth percussion test, with no previous history of orbital trauma, age ranging between 22 to 40 years.

Exclusion Criteria: Lefort I, II, III fractures diagnosed on basis of clinical and radiographic examination

Patients having medical co morbidities like diabetes, hypertension, psychiatric disorder diagnosed on medical record and patients with pathologic bone fracture.

Data Collection Method and Tool: Data was collected after approval from IRB of Ayub Medical College. Patients with unilateral zygomatico maxillary bone fracture satisfying the exclusion and inclusion criteria, and who were ready to give knowledgeable permission once explained study protocol, usage of data for research purpose only were included in our study.

All reduction surgery were accomplished under general anesthesia by single highly expertise surgeon. Post-operative infra orbital nerve recovery was assessed by single maxillofacial surgeon on post-operative follow-up after 15 days. Patients were supervised for retrieval of infraorbital nerve function clinically at specific sites including mid of lateral nose region, upper lip's middle region and middle region of Zygoma by using two point

discrimination test and percussion test on teeth of effected site. Demographic data were collected on separate planned proforma. **Data analysis:** Collected data was entered and examined on SPSS v26. For Gender and infra orbital nerve recovery, frequency and percentages were calculated. For age, mean and standard deviation was calculated. Outcome convertors like gender, age; type of trauma was measured through stratification. Chi Square test was used after data stratification while taking P-value ≤ 0.05 as significant.

RESULTS

Data of 150 patients were collected. Out of these 150, 82 were females and 68 were male. The mean age (SD) was 31.48 (5.67 SD) years. Other socio-demographic characteristics are represented in table 1. 106 (71%) of ZMC patients recovered from infra orbital nerve after Open Reduction (Table 2). Recovery of Infra orbital nerve regarding in both age groups is shown in table 3.

Table 1: Demographic results

	Minimum	Maximum	Mean Value	SD
Age	22	40	31.48	5.67
Gender	Below 30	Above 30	Total	
Male	29	39	68	
Female	37	45	82	
Total	66	84		

Table 2: Presence of infra orbital nerve recovery regarding Open Reduction

Infra orbital nerve recovery regarding Open Reduction	N (%)
Yes	106 (71%)
No	44 (29%)
Total	150 (100%)

Table 3: Stratification of outcome in both groups concerning age

Group age	Recovery of infra orbital nerve		Total	p-value
	Yes	No		
Below 30 years	46	20	66	0.004
Above 30 years	60	24	84	

DISCUSSION

Data of 150 patients were collected. Out of these 150, 82 were females and 68 were male. The mean age (SD) was 31.48 (5.67 SD) years. In this present research, from 150 patients, it was witnessed that the least age was found 22 years and max age was 40 years with mean and SD of the age was 31.48 \pm 5.67 years. There were 68/150 (45.3%) male patients while females were 82/150 (54.7%) (Table1). In this study, recovery of Infra orbital nerve regarding open reduction was found successful in 106/150 (71%) patients while it was not in 44/150 (29%) patients (Table 2). After applying Chi-square, recovery of infra orbital nerve among 2 groups, concerning below 30 years age, was found significant (Table 3).

In previous study from UK² stated the management outcome of one hundred and six subjects with zygomatic fractures managed with conventional technique and by open reduction. The patients accomplished with conventional technique, fifty one percent agonized late compact sensitivity in the infraorbital region at sequel inspection, although in the group with miniplate osteosynthesis only twenty one percent had late neural sequelae.⁴ Another study¹³ revealed that complete regaining in seventy four percent after internal fixation and open reduction. Other investigation establish that infraorbital nerve functionality was entirely overturned in almost 78% of subjects afterward open reduction technique along with internal fixation.¹⁴ This inclination is recognized by Tacher et al who described that thirty percent of the subjects had sensory malfunction after miniplate osteosynthesis in ZMC fractures

associated to 42- 69% preserved with other approaches and established seventy percent patients were free of paresthesia after open reduction & internal fixation was done.¹⁵ Benolel verified occurrence of infraorbital nerve injury following ZMC fractures varies from 18-83%. Benolel testified the neurosensory changes accomplished in numerous means and established that plate fixation permits for considerably improved refurbishment of infraorbital nerve function. The occurrence of chronic neuropathic pain after the zygomatic fractures was infrequent.¹⁶

CONCLUSION

On the basis of this study it is recommended that open reduction as chosen mode of management whose outcomes in enhanced functional nerve recovery amongst patients with paresthesia when linked to closed reduction methods

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