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ANTERIOR MANDIBLE AND CONDYLAR FRACTURE;

A COMPARATIVE EVALUATION OF OPEN AND CLOSED REDUCTION.

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ABSTRACT… Objectives: To compare the outcome of two treatment protocols (open and closed reduction) in the management of Anterior mandible and condyle fracture in our center. **Study Design:** Comparative cross sectional study. **Place and Duration of Study:** Department of Oral & Maxillofacial Surgery, Liaquat University of Medical & Health Sciences, Jamshoro, Hyderabad. This study was conducted from April 2017 to September 2017. **Methodology:** This study was consisted of total 48 patients which were equally divided into two groups Group-A (Closed Reduction that is Eyelet or Arch Bar) and Group-B (Open Reduction) having anterior mandible were included. For closed reduction technique, maxillomandibular fixation was applied for 4-6 weeks. For open reduction, fracture was fixed with miniplates after achieving the normal occlusion. Post operatively, occlusal disturbances was considered having poor occlusion and patient with maximum intercuspation was considered as good occlusion. Mouth opening more than 25mm was considered as good mouth opening. **Results:** In group-A 23(95.8%) patients at 3rd month were found with good occlusion. In group-B, good occlusion was found in 21(87.5%) patients at 3rd month. In group-A 22(91.7%) subjects at 3rd month were found with good range of motion and in group-B good range of motion was found in 20(83.3%) subjects at 3rd month. In group-A, mean deviation was 0.54±0.72 mm at 3rd month while in group-B, mean deviation was 1.12±1.65 mm at 3rd month. **Conclusion:** Open reduction with two correctly positioned plates for the stabilization of anterior mandibular and condylar fractures yielded better function compared to closed reduction.

Key words: Outcome, Open Reduction, Closed Reduction, Management, Anterior Mandible, Condyle Fracture.

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INTRODUCTION

A fracture is defined as "A breach in the continuity of the bone either pathologically or traumatically".[1] The mandible is a unique horse shoe shaped bone having a important role in esthetics of the face and functional occlusion. Fractures of mandible are common among facial trauma that accounts for 15.5% to 59% of all facial fractures while higher incidence of fracture of mandible is due to the prominent anatomical position that renders it more vulnerable to fracture.[2]

Common etiological factors are road traffic accidents, assault, gun shots injuries, industrial accidents and sports injuries. Recently it has been estimated that about 25% of all these traumas are caused by road traffic accidents in developing countries. Age group of 21 to 30 year-old are more frequently involved with a male to female ratio of 3:1.[3]

The mandibular fracture varies according to centers and countries, while the condyle is most commonly involved followed by angle, symphysis and parasymphysis (Anterior Mandible) as the most frequently encountered fracture site.[4] Various studies have revealed that anterior mandible (symphysis and parasymphysis) is the second most frequent site among mandibular fractures.

The clinical features of condylar and anterior mandible fracture include pain, swelling, limited mandibular movement, step deformity muscle

spasm, deviation of the mandible, malocclusion, pathological changes in the Temporomandibular Joint, facial asymmetry, and ankylosis, irrespective of whether treatment was performed or not.[5]

Mandibular condyle fracture can be classified as unilateral or bilateral; according to the fracture position (condyle head, condyle neck and subcondyle) and anterior mandible fracture according to the degree of fracture displaced (non-displaced, deviated, displaced and dislocated).[6]

Anterior mandible fractures are defined as fractures that involve region bounded bilaterally by vertical lines just distal to canine teeth.

The treatment options of condyle fractures and anterior mandible fracture are open reduction and internal fixation or closed reduction with maxillomandibular fixation; however, either closed or open technique, the success of the treatment relies on the restoration of normal dental occlusion and bony union, immobilization and prevention of infection.[7] There are advantages and disadvantages to both methods of fixation. Closed reduction does not hurt the vascular envelope, cheap for the patient, no jeopardy to facial nerve and can be managed under local anesthesia; nevertheless, it is accompanying a substantial period of immobilization, shutting of the oral cavity, necessitates integral dentition, uncomfortable for the patients and requires patient's compliance for oral hygiene maintenance. On the other hand, ORIF permits for direct picturing and reduction of fractured bone sections and rebuilding of the patient's preinjury occlusion without maxillomandibular fixation; this lets for bony healing in a tinier period of time (primary bone healing), better nutrition and oral hygiene; however, likely foreign body infections are supplementary with this method and it carries a noteworthy threat of facial nerve traction injury.[8]

In favorable fractures detected radio graphically, closed method is preferred but reports suggests that conservative management may result in non union

Following champy's principle of ORIF two miniplates are sufficient to compensate the torsional forces acting on that area[9], but many authors had use various modifications for the parsymphysis fracture treatment instead of using two miniplates, and thus treatment of anterior mandible varies from surgeon to surgeon and center to center.[10]

DATA COLLECTION PROCEDURE

Patients met the inclusion criteria came through Out Patient Department (OPD) or through emergency department were involved in this research. A written consent was taken from every patient / attendant.

Diagnosis of mandibular condyle fracture was done on the basis of clinical examination, Orthopantomography (OPG) and P. A view of face. Informed consent was taken from the patient for the procedure used. For closed reduction technique, maxillomandibular fixation was applied for 4-6 weeks. For open reduction, a preauricular incision was given and fracture was reduced and fixed with miniplates after achieving the normal occlusion.

Post operatively, patients of both the group were recalled after one, two and three months for the assessment of the functional effects such as occlusion, range of motion and deviation in both groups. A complaint about occlusal disturbances such as, premature contact, anterior open bite and posterior open bite were considered having poor occlusion and patient with maximum intercuspation was considered as good occlusion. For range of motion, patient's mouth opening was assessed and classified in two groups i.e. mouth opening less than 25mm were considered as poor and mouth opening more than 25mm were considered as good mouth opening.

RESULTS

The frequency distributions of both groups according to gender are presented in Table-I.

The frequency and percentages of age groups is shown in Figure-1

As location of fracture is concerned,

parasymphysis and condylar Neck was found most common location of fracture in both groups as presented in Table-II.

	Group A N (%)	Group B N (%)
Male	21(87.5)	17(70.8)
Female	3(12.5)	7(29.2)
Total	24	24

Table-I. Frequency of patients according to gender (n=48)

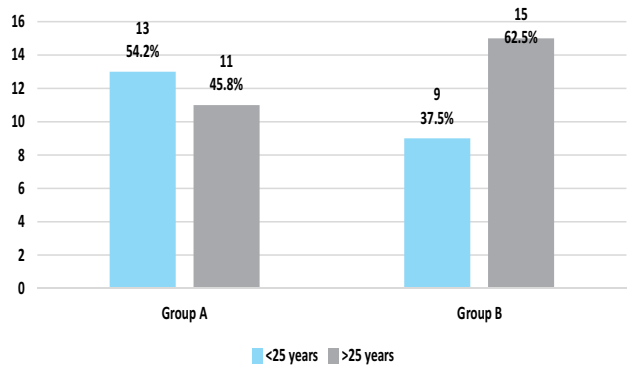

Figure-1. Frequency and percentage of patients according to age group (n=48)

	Group A n(%)	Group B n(%)
Symphysis	11(45.8)	11(45.8)
Parasymphysis	13(54.2)	13(54.2)
Sub Condyle	11(45.8)	11(45.8)
Condylar Neck	13(54.2)	13(54.2)

Table-II. Frequency distribution of fracture location (n=48)

In this study, Frequency and percentage of patients in terms of occlusion is shown in Figure-2

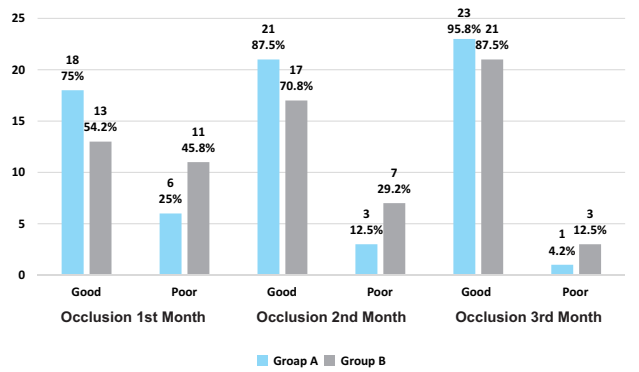

Figure-2. Frequency and percentage of patients according to occlusion (n=48)

Figure-3 shows details of range of motion.

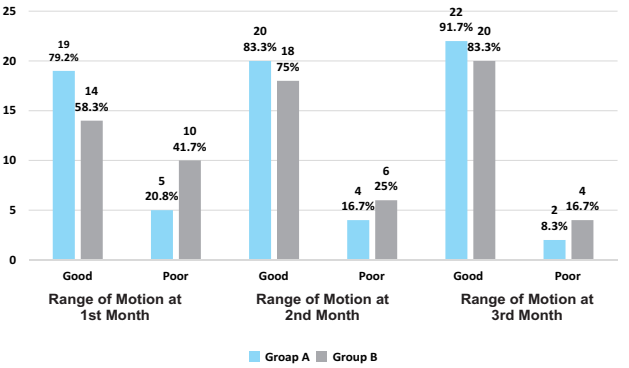

Figure-3. Frequency and percentage of patients according to range of motion (n=48)

DISCUSSION

It has been observed that the incidence of mandibular fracture increases with growing age from 0 to 30 years then gradually decreases from 31 years of age. A study in India was conducted to find out the incidence and the pattern of mandibular fractures in the Lucknow city of India.[1] It was found that the incidence of mandibular fractures was uppermost in 21 to 30 years of age (28.8%) trailed by 11 to 20 years of age (25.8%); minimum being in 60 years and above (4.5%). This is in conformism through Adi et al.[11] Our study in comparison the above mentioned studies showed the high incidence of mandibular fractures in >25 years of age and low in ≤25 years of age group.

With regard to the location of the fracture, our study participants had 45.8% symphysis and subcondylar fractures and 54.2% had fractures of the neck and parasymphysis. Another study from Pakistan aimed at studying the type/location of Condylar fracture among patients referred to a tertiary care hospital. It was reported that highest number of patients with sub condylar fractures with 39.8%.[12] The study conducted by Viveka and Reddy[13] who reviewed 175 cases of mandibulaf fractures and showed paraymphysis and subcondylar fractures was the common in total cases i.e. 88, than Condylar neck and Condylar head. The presence of permanent tooth buds is most probable reason for increase frequency of parasymphysis fracture.[11]

In the international collaborative study, after 6 months, in the conservative management group 7 out of 30 (23%) patients stated occlusal conflicts. In the open reduction, 3 out of 36 (9%) patients reported occlusal troubles.[14] In our study group in the ORIF group, good occlusion was observed in 54.2% while poor occlusion was observed in 45.8% of the patients in the first postoperative month. In 2nd & 3rd post-operative months good occlusion was then found to be in 70.8% and 87.5% of patients respectively while poor occlusion was found to be in 29.2% and 12.5% of patients in 2nd & 3rd post-operative months respectively.

With regard to occlusion, Ellis et al.[15] detected a higher rate of occlusal instabilities after closed treatment and Throckmorton and Ellis[16] and Palmieri e[17] establish more encouraging outcomes after ORIF. Khan A et al[18] confirmed improved clinical grades for surgical management. The enhanced results for ORIF propose that inclination for conservative handling should be dropped.

CONCLUSION

In present study, open reduction has yielded better function of the TMJ compared to closed reduction. Hence, it is conclude that the practice of appropriately placed plates for the stabilization of anterior mandible and condylar fractures is the superlative solution in demand to provide unchanging osteosynthesis. Except for undisplaced fractures, open reduction and internal fixation should be the method of choice for every case unless contraindicated.

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AUTHORSHIP AND CONTRIBUTION DECLARATION

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3	Syed Fida Hussain Shah	Data analysis, Resutls.	
4	Syed Ghazanfar Hassan	Study design, Data collection.	
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