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Retrospective Study of Open versus Closed Treatment of Mandibular Condylar Fractures.

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Abstract: *The purpose of the present study was to analyze the open versus closed treatment of mandibular condyle fractures. A retrospective study of 54 patients treated for mandibular condyle fractures at Department Dental Surgery, KAP Vishwanatham medical college, Trichy between 2016-2018 was performed. Thirty two patientswere treated nonsurgically and Twenty two patients by surgical treatment. Clinical and radiological parameters were evaluated during the follow up period.In nonsurgical group, 18 patients (56%) had loss of vertical ramus height. In open reduction group temporary facial nerve weakness was seen in 2 patients(9%) and one patients developed post operative infection. None of the patients in both groups had malocclusion. Surgical treatment provided more accurate results clinically as well as radiographically.*

Keywords: *Condylar fracture, Open reduction, Closed reduction*

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I. Introduction

Condylar fracture management has always been a controversial area as when, and how fractures of the mandibular condyle should be operated.[4]Considerable consenses can be found in favor of closed treatment with Intermaxillary fixation (IMF) with arch bars, eyelet wires, or splints. Cases managed through closed reduction or nonsurgical means have shown satisfactory functionl and clinical results[. 5] Morbidity and complications associated with surgery can be avoided. The closed technique either allowsbony union to occur, when there is no significant displacement or, itproduces an acceptable functional pseudoarthrosis by re-education of the neuromuscular pathways. The closed technique of condylar fracture ranges from observation and prescription of a soft diet to variable periods of immobilization followed by intense physiotherapy. The length of the period of immobilization is controversial: It must be long enough to allow initial union of the fracture segments but short enough to prevent complications such as muscular atrophy, joint hypomobility and ankylosis. Current consensus on the period of immobilization ranges from 7 to 21 days. The period may be increased or decreased depending on concomitant factors such as the age and nutritional status of the patient, the level of the fracture, the degree of displacement, and the presence of additional fractures. On the other hand open treatment of condylar fractures has become more common, probably because of the introduction of plate and screw fixation devices that allow stabilization of the fracture fragments.3 Repositioning of thefractured condyle to its anatomical location is the sole target which is achieved by exposing the condylar fragment, reducing it to a normal relationship with the mandibular fragment and then fixing it in that position. This retrospective study is aimed at comparing the openand closed treatments of mandibular condyle fractures

II. Methods

This retrospective study was conducted on the patients who were treated for mandibular condyle fractures at the Department Dental Surgery, KAP Vishwanatham medical college, Trichybetween 2016-2018. Fifty four patients withcondylar fractures were included in the study. Informed consent was obtained from the patient after thoroughly explaining the advantages and disadvantages of closed and opentreatment modalities. Out of the total number of 54 patients, 32 (28 males and 4 females) had undergone closedmanagement which included closed reduction with Intermaxillaryfixation ranging from 2-4 weeks followed by physiotherapy. The other 22 patients (20males and 2 females) were treated surgically by means of open reduction and rigid internal fixation. Extra oral approach to condyle was made in all these 22 patients, the retromandibular transparotid approach in all patients, Various parameters were assessed: Mouth opening, deviation of the mandible, pain in temporomandibular joint, malocclusion, reduced ramal height, pain on lateral excursion.

III. Results

In this present study, 54patients with condylar fractures were included. Out of 54 patients, 48 (88.8%) were male and 6 (11,1%) were female. Isolated condylar fractures were present in 26 cases (48%) and condylar fractures with other associated fractures were present in 28 cases (52%). Road traffic accidents were the main

cause of trauma in 32 cases (59%) followed by Assault 12cases (22%), Fall in 6 cases (11%) and other injuries in 4cases 8%. (Figure-1)Out of 54patients 32 patients (59%) were treated by closed reduction (Figure-2) and 22 patients (41%) were treated by open reduction (Figure-3). In closed reduction group the maximum interincisal opening ranged from 30-42 mm (average 35 mm). In open reduction group the maximum interincisal opening ranged from 32-42 mm (average 37mm) Mandibular deviation towards fractured side was noted in 12 cases (37.5%) of closed reduction group and 4 cases (18%) of open reduction group. Pain in TMJ was noted in 14 cases (44%) of closed reduction group and 6 cases (27%) of open reduction group which got subsided gradually on follow up period. None of the patients in both groups had malocclusion. Radiographically vertical ramus height reduction present in 18

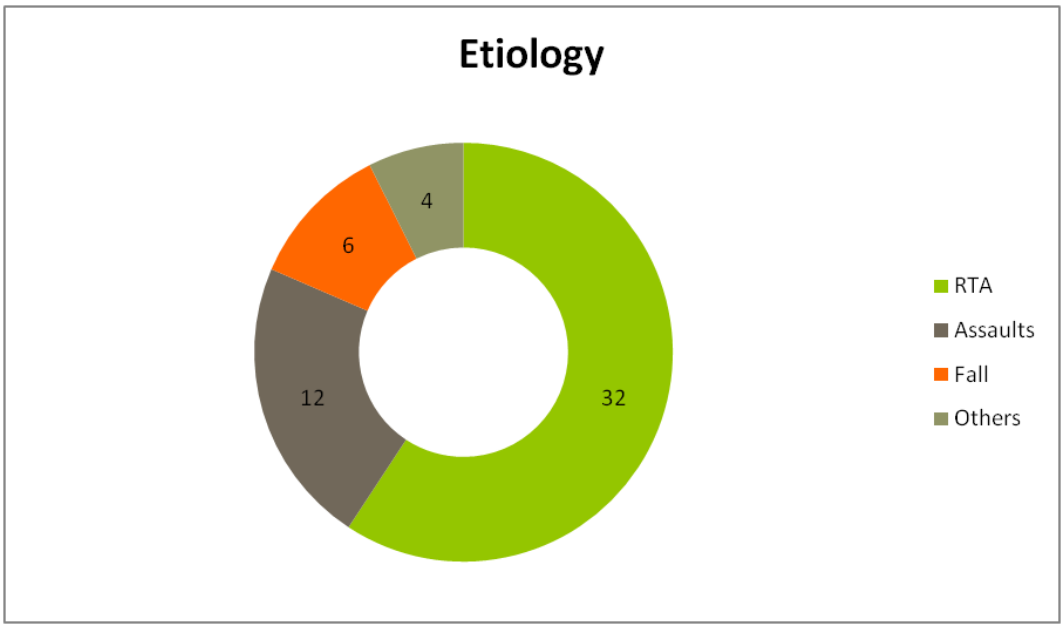

Figure-1: Fracture etiology.

patients (56%) of closed reduction group, but open reduction group patients had normal vertical ramus height postoperatively. Pain on lateral excursion was present in 12 patients (37.5%) of closed reduction group and 6 patients (27%) of open reduction group (Table- 1). In open reduction group 2 patients (9%) had temporary facial nerve weakness; one patient had postoperative infection.

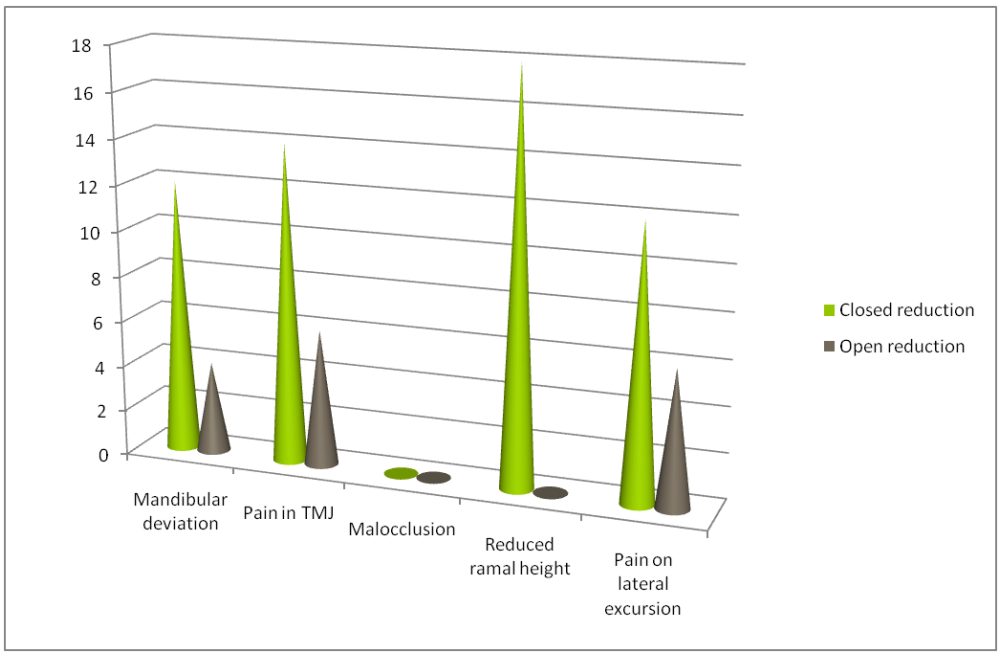

Table 1. Comparison of surgical and nonsurgical treatment with respect to postoperative outcome.

IV. Discussion

There has been a lot of literature that hascompared closed with open treatment of mandibular condyle fractures. In our study 54 patients with condylar fractures treated in the Department Dental Surgery , KAP Vishwanatham medical college, Trichy between 2016-2018 were included. Out of 54 patients 32(59%) patients were treated nonsurgically by Intermaxillaryfixation ranging from 2-4 weeks with elastics and followed by physiotherapy. Other 22patients (41%) were treated surgically by open reduction and rigid internal fixation by miniplate osteosynthesis. According to Ellis et al[6-13]Open reduction has been associated withscar development and temporary (6 months) paralysis of facial nerve branches whereas closed approach is associated with many problems such as chronic pain, malocclusion, asymmetry, limited mobility, and gross radiographic abnormalities. Hidding et al[14] also concluded that deviation on opening occurred in 64% of patients treatedconservatively compared with 10% managed with Open reduction. Rest of the parameters remained same between the groups. Radiographic findings suggested anatomic approximation in 93% of Open group patients but only 7% of the closed group. Haug et al[15] reported that there were no statistically significant differences between the Open and closed reduction. Good aesthetic and functional results are possible even if exact anatomical repositioning is not achieved. The Open reduction group was associated with scars, and the closed reduction group with chronic pain. Ellis et al, also noted the advantages of retromandibular approach over the preauricular approach, submandibular approach and intraoral approach for Open reductionof condylar fractures,[6]and noted that the best approach for Open reduction of condylar fracture is Retromandibular approach. In our study all cases were approached through the retromandibular approach for reduction of subcondylar fractures. Out of 22 patients in open reduction group, 2 patients had facial nerve weakness, one had upper eyelid weakness and the other had lowerlip weakness which resolved in 3-4 weeks. Based on ourstudy retromandibular approach provides safer and better reduction of condylar fractures and this finding correlates with the study of Narayanan et al,[16] Tang et al,[17]Biglioli et al[18] and Devlin et al[19]. Open reduction group exhibits good mouth opening post operatively when compared to closed group, which correlates with the study of Eckelt et al,[20] Vesnaver.[21]Mandibular deviation towards fractured side was noted in 12 patients (37.5%) treated by closed method which was attributed to reduced ramal height. This finding correlates with the study of Silvennoinen et al.[22]In our study there is no statistically significant difference in malocclusion found between open and closed group which correlates with the study of Haug et al.[15] Radiographically Vertical ramus height was significantly reduced in 18 patients (56%) treated by closed method. whereas open group had normal vertical ramus height. This finding correlates with the study of Ellis et al,[9] Eckelt et al,[20] Danda et al.[23]Lateral excursive movements were within the normal limits for both the groups which correlate with the findings of De Riu et al.[24] In particular, there was no permanent damage to the facial nerve branches in the surgically treated group. This finding correlates with the study of Eckelt et al.[19] Haug et al maintained that there was higher perception of scaring associated with open group when compared to closed group.[14] Patients' treated by open method had the advantage of early recovery of function in terms of pretraumatic occlusion, mastication, speech and enhanced nutrition. On the other hand nonsurgically treated patients required prolonged period of maxillomandibular fixation and elastic traction which cause significant disturbances.

Figure 2 – closed reduction with elastic IMF

Figure 3- Open reduction with titanium mini plates

V. Conclusion

Reduced mouth opening, Pain in TMJ, vertical ramus height reduction, Pain on lateral excursion , mandibular deviationtowards the fractured side was observed more commonly in closed reduction group than in open reduction group.In open reduction group facial nerve weakness was seen in 2 patients and one patient developed postoperative infection. Based on the above findings this study concludes that patients treated by closed reduction give reasonably good clinical results, though the condyle is not anatomically normal in radiographs. Whereas patients treated by openreduction show excellent results clinically as well as radiographically. This retrospective study shows results which are clearly in favor of open reduction and fixation of moderately displaced condylar fractures. In our opinion open reduction is indicated in cases of dislocated condylar fractures with ramus shortening and occlusal disharmony and closed reduction in cases of undisplaced condylar fractures without occlusal disharmony. Perhaps a larger sample size of the study would yield more thorough results.

VI. Conflict Of Interest

No potential conflict of interest relevant to this article was reported.

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