

Management of Subcondylar Fracture by Open Reduction and Closed Reduction: A Comparative Study

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ABSTRACT

Background: The prevalence of maxillofacial injuries is elevated due to high incidence of road traffic accidents. Amongst the maxillofacial injuries, the mandibular fracture is the most commonest type. However, there are definite signals for the management of condylar or subcondylar fracture by open reduction of condylar fracture. The present study was conducted with the aim to compare the radiological and clinical outcome of open reduction and closed reduction for the management of condylar fractures.

Materials and methods: The present retrospective study was conducted in our hospital for a period of 3 years. All the subjects with minimum 3 months of follow up were included in the study. All the subjects were made to visit the hospital for follow up readings. The occlusion, maximal mouth opening, deviation on opening, and nerve injury were recorded. All the data was arranged in tabulated form and expressed as mean $\pm$ standard deviation. Mann-Whitney test was used for statistical analysis. Probability value of less than 0.05 was regarded as significant.

Results: The present study analyzed 42 cases of condylar fractures. Out of which, 20 were managed by closed reduction and 22 were managed by open reduction and internal fixation. The postoperative ramal height amongst subjects undergoing closed reduction and ORIF was 1.98 ± 0.97 and 1.98 ± 0.97 respectively. There was no significant difference between the two. There were 4 cases of deviation in mouth opening in closed reduction subjects and 5 cases in ORIF subjects.

Conclusion: In our study, there was no significant difference in the results obtained by closed reduction and open reduction.

Keywords: deviation, retrospective, subcondylar.

INTRODUCTION

The prevalence of maxillofacial injuries is elevated due to high incidence of road traffic accidents. Amongst the maxillofacial injuries, the mandibular fracture is the most commonest type. Amongst the mandibular fractures, the incidence of condylar and subcondylar type is on the elevated rate.¹⁻⁴ Management of mandibular condylar and subcondylar fracture remains a topic of debate and is mostly commonly managed by closed method which is by maxillomandibular fixation.

Open reduction is rarely done. In the recent years, open reduction and internal fixation has become more commonly used treatment option.⁵ Management of open reduction of condylar fractures requires high technical expertise and skill. It needs a complete knowledge of anatomy as well as requires meticulous planning dissection and execution. Hence, open reduction of condylar fractures is not a frequently performed procedure. However, there are definite signals for the management of condylar or subcondylar fracture by open reduction of condylar fracture. It varies from

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case to case.^{6,7} The present study was conducted with the aim to compare the radiological and clinical outcome of open reduction and closed reduction for the management of condylar fractures.

MATERIALS AND METHODS

The present retrospective study was conducted in our hospital for a period of 3 years. The study retrospectively analyzed subjects reporting to the department with sub condylar fractures. The method of treatment was based on the experience and preference of surgeon. A total of 42 subjects were studied. Out of which 20 were managed by closed reduction and 22 by open reduction internal fixation. Closed reduction subjects were followed up for a mean duration of 11 months and open reduction internal fixation subjects were followed up for 4 months. All the subjects with minimum 3 months of follow up were included in the study. All the subjects were made to visit the hospital for follow up readings. The occlusion, maximal mouth opening, deviation on opening, and nerve injury were recorded. Radiologic evaluation was also performed to estimate the tangential angulation of the displaced fragment and loss of ramus height. Panoramic radiographs were taken at the first visit and three months later to evaluate the ramal loss and angulation. All the data was arranged in tabulated form and expressed as mean $\pm$ standard deviation. Mann-Whitney test was used for statistical analysis. Probability value of less than 0.05 was regarded as significant.

RESULTS

The present study analyzed 42 cases of condylar fractures. Out of which, 20 were managed by closed reduction and 22 were managed by open reduction and internal fixation. There were 28 males and rest 14 females in the study. Lateral overlap was seen in majority of the fractures. Table 1 demonstrates the loss of ramal height amongst both the groups. The mean preoperative ramal height amongst subjects undergoing closed reduction and ORIF was 2.45 $\pm$ 2.19 and 3.67 $\pm$ 2.35 respectively. There was no significant difference between the two. The postoperative ramal height amongst subjects undergoing closed reduction and ORIF was 1.98 $\pm$ 0.97 and 1.98 $\pm$ 0.97 respectively. There was no significant difference between the two. The mean

difference amongst both the groups was 1.23 $\pm$ 1.63 and 2.56 $\pm$ 2.06 respectively with no significant

Table 1: loss of ramal height amongst the groups

Variable	Closed reduction	ORIF	P value
Preoperative	2.45 $\pm$ 2.19	3.67 $\pm$ 2.35	>0.05
Postoperative	1.98 $\pm$ 0.97	1.14 $\pm$ 1.20	>0.05
Difference	1.23 $\pm$ 1.63	2.56 $\pm$ 2.06	>0.05

Table 2: Angulation of the fractured fragment amongst the groups

Variable	Closed reduction	ORIF	P value
Preoperative	3.68 $\pm$ 2.55	8.67 $\pm$ 5.76	<0.05
Postoperative	2.46 $\pm$ 2.43	1.64 $\pm$ 0.91	>0.05
Difference	0.42 $\pm$ 1.57	6.95 $\pm$ 4.90	<0.05

Table 3: Clinical variables amongst the study groups

Parameter	Closed reduction (n=20)	ORIF(n=22)
Malocclusion	0	0
Limitation in mouth opening	0	0
Deviation in opening	4	5
Nerve injury	0	0

difference between the groups. Table 2 illustrates the angulation of the fractured fragment amongst the groups. The mean preoperative and postoperative angulation in closed reduction subjects was 3.68 $\pm$ 2.55 and 2.46 $\pm$ 2.43 respectively. The mean preoperative and postoperative angulation in ORIF subjects was 8.67 $\pm$ 5.76 and 1.64 $\pm$ 0.91 respectively. There was a significant difference in the preoperative angulation amongst the groups. There was a significant difference in the angulation amongst both the groups. Table 3 demonstrates the clinical variables amongst the groups. There were 4 cases of deviation in mouth opening in closed reduction subjects and 5 cases in ORIF subjects.

DISCUSSION

The subcondylar region is the most frequent site of mandibular condyle fracture ^{8,9}. The management of subcondylar fractures can be classified into two major methods: closed reduction and open reduction and internal fixation. Closed reduction needs an ample duration of maxillomandibular fixation which is followed by active physiotherapy. Open reduction allows good repositioning anatomically and immediate movement of the jaw functionally. Mandibular condylar fracture are very commonly observed fracture Amongst the mandibular fractures; the management methods for the condylar fracture have been controversial. However, irrespective of the treatment option, the aim of the treatment of mandibular condylar fracture is to restore normal joint function via the reconstruction of apt anatomical position. In spite a plethora of treatment options available, management of subcondylar fracture of the mandible still remains debatable. The present study compared open reduction and closed reduction treatment methods. As per the present study, the mean preoperative ramal height amongst subjects undergoing closed reduction and ORIF was 2.45 ± 2.19 and 3.67 ± 2.35 respectively. There was no significant difference between the two. The postoperative ramal height amongst subjects undergoing closed reduction and ORIF was 1.98 ± 0.97 and 1.98 ± 0.97 respectively. There was no significant difference between the two. The mean difference amongst both the groups was 1.23 ± 1.63 and 2.56 ± 2.06 respectively with no significant difference between the groups. The mean preoperative and postoperative angulation in closed reduction subjects was 3.68 ± 2.55 and 2.46 ± 2.43 respectively. The mean preoperative and postoperative angulation in ORIF subjects was 8.67 ± 5.76 and 1.64 ± 0.91 respectively. There was a significant difference in the preoperative angulation amongst the groups. There was a significant difference in the angulation amongst both the groups. There were 4 cases of deviation in mouth opening in closed reduction subjects and 5 cases in ORIF subjects. During the last few decades, closed reduction has been the preferred choice of management ⁴; however, closed reduction requires a duration of maxillomandibular fixation that is followed by active physiotherapy ⁵. Also, there are some long-term complications like pain, arthritis, deviation of the mandible during opening, inadequate establishment of vertical height of the

ramus causing malocclusion, and ankylosis. ⁶ Surgical management allows for proper anatomical repositioning and immediate functional restoration of the jaw movement ⁷. In cases where there is severe dislocation, surgical treatment is preferred ^{6,9}.

CONCLUSION

Though closed reduction is the treatment of choice for the management of subcondylar fractures but nowadays open reduction is also performed. In our study, there was no significant difference in the results obtained by closed reduction and open reduction.

CONFLICT OF INTEREST

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

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