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# **Original Research**

# **Closed versus open treatment of mandibular condylar process fractures**

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#### ABSTRACT:

**Background:** To compare closed and open treatment in fractures of mandibular condylar process. **Materials & methods:** A total of 10 subjects with mandibular fractures due to traumatic events were included. The patient's abilities of mouth opening were assessed in centimeters within 1 month, 6 months, and 1year after the operations. The data was collected and results were analysed using SPSS software. The p- value less than 0.05 was considered significant. **Results:** The mean age of the patients was 26.5 years ranging from 10-50 years. Assessments of mouth opening showed significant improvements in this ability within the follow-up period in both groups (P<0.001 for both). **Conclusion:** Subjects treated with ORIF had better clinical results after follow up for a year of the surgical procedures.

Keywords: Closed treatment, Condylar fracture, ORIF.

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## INTRODUCTION

The mandible is the second most common facial bone to fracture due to trauma.1 The condylar and subcondylar region is the most common site of fracture of the mandibular bone in people with trauma and accounts for about 2% of cases of mandibular fractures. <sup>2,3</sup> The mandibular condyle consists of three areas: the shaft, the neck, and the subcondyle. Fractures at the junction of the head and neck, especially intracapsular fractures, are termed head fractures, and border fractures between the sigmoid or above it (below the head area) are referred to as condylar neck fracture.<sup>4</sup> A fracture below the sigmoid region is called a subcondylar fracture. Although most condylar fractures are in the subcondylar region, fractures in all three areas are generally referred to as condylar fractures. 5

The treatment goal of condylar fracture should be pain-free mandibular motion, good occlusion, and symmetry.<sup>6</sup> Condylar fractures were traditionally treated with conservative approaches. The choice of treatment method, i.e., conservative or surgical management in adults, is a controversial issue among oral and maxillofacial surgeons around the world. In children, because of a high remodeling capacity of the temporomandibular joint (TMJ), most surgeons prefer the nonsurgical method. This capacity is significant especially during the younger years and decreases while the child is growing. While reaching adulthood, the remodeling capacity has almost vanished. <sup>7</sup>Two different treatments namely closed treatment (without surgery) and open surgery, is common in the treatment of condylar fractures. In most cases where the condyle remains in the joint surface area and there is no severe displacement, non-surgical treatment and physiotherapy are recommended.<sup>8</sup> Surgical treatment is recommended in cases of severe condylar displacement or severe dislocation of fractures that can lead to a reduction in the height of the mandibular ramus.<sup>9</sup> Hence, this study was conducted to compare closed and open treatment in fractures of mandibular condylar process.

## **MATERIALS & METHODS**

A total of 10 subjects with mandibular fractures due to traumatic events were included. Those cases with

severe lateral dislocation of the mandibular condyles or severe dislocations of the fractured parts were assigned to the open surgical treatment group. The other patients were treated using Arch bar + intermaxillary fixation (IMF). The patient's abilities of mouth opening were assessed in centimeterswithin 1 month, 6 months, and 1year after the operations. The data was collected and results were analysed using SPSS software. The p- value less than 0.05 was considered significant.

# RESULTS

A total of 10 cases with mandibular fractures were included. The mean age of the patients was 26.5 years ranging from 10-50 years. Assessments of mouth opening showed significant improvements in this ability within the follow-up period in both groups (P<0.001 for both). Furthermore, we observed that patients treated by the open mandibular fixation procedure had significantly better results within the 6 months and 1 year after the procedures.

Variable		1 month	6 months	1 year	P -value
Mouth opening	ORIF	22.25	37.47	41.02	< 0.001
(mean)	Closed group	23.15	30.56	33.12	< 0.001
P- value		0.12	0.02	0.03	

 Table 1: Assessments of mouth opening

(ORIF)- open reduction and internal fixation

## DISCUSSION

The choice of surgical versus nonsurgical treatment for fractures of the condylar process remains a controversial issue. In the past, condylar fractures have been treated solely by a closed reduction for various reasons, such as complications involving the facial nerve, technical problems, and scar on the face following surgical treatment, and reasonable good results have been achieved with conservative treatment. However, the closed reduction has longterm complications such as deviation of the mandible, malocclusion, and ankylosis. <sup>10</sup>Hence, this study was conducted to compare closed and open treatment in fractures of mandibular condylar process.

In the present study, a total of 10 cases with mandibular fractures were included. The mean age of the patients was 26.5 years ranging from 10-50 years.Assessments of mouth opening showed significant improvements in this ability within the follow-up period in both groups (P<0.001 for both).A study by Tabatabaee A et al, 726 mandibular fractures were evaluated. The data showed that 302 fractures (41.6%) were in the mandibular condyles. Of the 302 condylar fractures, 172 fractures (57.1%) occurred due to automobile accidents and 82 fractures (27.5%) occurred due to direct trauma. 203 patients (67.2%) underwent the close surgical procedures using maxillary and mandibular fixation using arch bar + IMF. 99 patients (32.8%) underwent open mandibular fixation operation and internal fixation (ORIF). Assessments of mouth opening showed significant improvements in this ability within the follow-up period in both groups (P<0.001 for both). After 2 years, no significant differences could be observed between groups. Both open and closed surgical approaches for condylar fractures are associated with significant improvements, however, patients that were treated with ORIF had better clinical results in the first year after the surgical procedures.<sup>11</sup>

In the present study, furthermore, we observed that patients treated by the open mandibular fixation procedure had significantly better results within the 6 months and 1 year after the procedures. Another study by Berner T et al, the studies increasingly suggest better results for open treatment, in terms of mouth opening, protrusion, laterotrusion, pain, and malocclusion. In the meta-analysis, the outcome was significantly better for laterotrusion and protrusion in patients treated by open reduction and internal fixation.Due to the different study protocols and lack of information on classification, follow-up time, and inclusion criteria, comparison of the studies remains difficult and further prospective, randomized studies should examine these issues.<sup>12</sup>Prakash R Sr et al, carried out a prospective study among 22 patients who had minimally displaced or displaced condylar fractures. The patients were divided into two groups of 11 each: group A patients treated with open reduction and rigid internal fixation and group B patients treated with closed reduction and maxilla mandibular fixation. Follow-up examinations were performed at one week, one month, three months, and six months postoperatively. Preauricular pain was significantly decreased (p < 0.001) in both groups postoperatively but more significantly decreased in the open reduction group. There was a significant improvement in the mouth opening at every follow-up to a maximum mean of 37.36 mm in group A and a mean of 33.64 mm in group B. Significantly more improvement in protrusive and lateral movements and reduced deviation on mouth opening at every follow up was observed in the open reduction group. Both the treatment options for condylar fractures of the mandible yielded acceptable results with significant clinical differences in terms of occlusion, mouth opening, functional movements, and pain among patients with open reduction.<sup>13</sup>In the closed reduction group, occlusion was improved in most of the patients at six months follow-up. These findings correlate with the findings of Landeset al.14 However, one of the patients had occlusal discrepancy even at the sixthmonth follow-up, and these findings are similar to the study by Singh et al.,<sup>15</sup> wherein four patients had malocclusion. This might be due to the reduction in

the ramus height or to condyle dislocation from the fossa or the improper reduction of fracture fragments resulting in incomplete anatomical reduction.

#### CONCLUSION

Subjects treated with ORIF had better clinical results after follow up for a year of the surgical procedures.

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