

*MANDIBULAR CONDYLE FRACTURE MANAGEMENT OUTCOME IN  
DEPARTMENT OF PLASTIC RECONSTRUCTIVE AND AESTHETIC  
SURGERY, DR. SOETOMO GENERAL ACADEMIC HOSPITAL  
(2015-2018)*

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ABSTRACT

**Introduction:** The high incidence of condyle mandible fractures is due to the role of the mandibular ramus which has stronger resistance compared to head condyle mandibular. The management of condyle fractures is still controversial because of the prognosis. Management of condyle fractures of the mandible should aim at maximally reducing morbidity, postoperative complications, and aesthetic and/ or functional impairment.

**Methods:** The medical records of 56 patients with condyle mandible fractures who presented at the Dr. Soetomo General Academic Hospital Surabaya from January 2015 to December 2018 were reviewed retrospectively. We analyzed characteristics of the patients (age), type of fractures, management of fractures, and outcome from management.

**Results:** This study shows that a total of 56 patients, 22 were patients with mandibular condyle fractures only and 34 patients with mandibular condyle fractures with other maxillofacial fractures. The study showed that male patients (84%) is more than female patients (16%). The mean age of the patients involved in this study was  $28.25 \pm 1.78$  years, with the youngest being 12 years old and the oldest being 67 years old. The results of the overall study with good occlusion results in 48 patients, it was found that 22 patients were treated with closed reduction and 26 patients with open reduction were performed.

**Conclusions:** The results of condyle mandibula fracture management in Dr. Soetomo Hospital has been according to the indication with the treatment indication along with the result of good management.

**Highlights:**

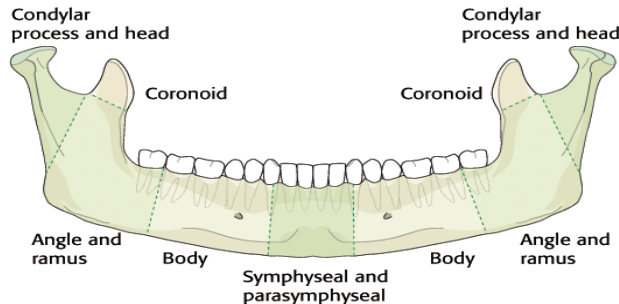
1. The management of mandibular condyle fractures is determined based on patient age, fracture type, systemic health, other maxillofacial fractures, and dental conditions factors.
2. Out of the total patients indicating successful management of mandibular condyle fractures at Dr. Soetomo Hospital.

**INTRODUCTION**

Mandibular fractures has the highest incidence among maxillofacial fractures,

followed by nasal fractures, and condyle fractures of the mandible are common. The high incidence of fracture of the condyle of the

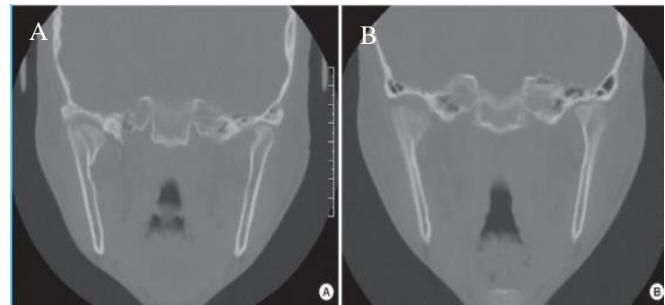
mandible is due to the role of the mandibular ramus which has stronger resistance compared to head condyle mandibular. The management of condyle fractures is still controversial because of the prognosis.<sup>1</sup>



Picture 1. Mandibular Anatomy (Anterior)<sup>10</sup>

The current indications for the management of mandibular condyle fractures are still controversial, therefore, for treatment it needs several considerations that need to be evaluated, such as fracture locations, degree of fracture angulation, degree of luxation of head condyle, type of fracture (simple/complex), dental status, presence or not another maxillofacial fractures, patient conditions, and foreign body invasion in temporomandibular joint.<sup>4</sup>

Closed reduction is the standard treatment for mandibular condyle fractures that are not dislocated or minimally displaced, accompanied by good patient compliance and good dental condition and allowing for maxillary mandibular fixation.<sup>4</sup> For closed reduction, intermaxillary fixation is performed using an arch bar and wire followed by maintaining maxillary and mandibular fixation for two to four weeks. After obtaining a stable union of the fracture section, the wire in the intermaxillary fixation is removed. Then normal occlusion was maintained after fixation using rubber and soft diet for 2 weeks. Functional therapy was performed for mandibular passive movement exercises and open mouth exercises were performed and results were observed.<sup>2</sup>



Picture 2. (A) Pre-op mandibular condyle fractures, (B) 4 weeks post-op *closed reduction* management.<sup>1</sup>

Various surgical methods for open reduction of mandibular condyle fractures depend on the fracture area and the degree of displacement of the bone fragments. Zide and Kent, presented the absolute and relative indications of mandibular condyle fracture in 1983, surgical open reduction was the new approach of surgical reduction and fixation of mandibular condyle fractures. Meanwhile, according to Mathes (1983), who also suggested an indication for open reduction, he also considered if there was malocclusion accompanied by centric relations, fragment angulation was more than 30 degrees, bone gap was more than 4-5 mm, lateral override, there was no contact with the fracture fragments.<sup>2</sup>

The ultimate goal of treatment lies in achieving occlusal stability, normal mouth opening, normal TMJ movement, prevention of temporomandibular joint disorders and joint pain, and prevention of growth disorders in patients with mandibular fractures by selecting the appropriate method of treatment between closed and open reduction.<sup>1</sup>

## METHODS

The medical records of 56 consecutive patients admitted to the Dr. Soetomo General Academic Hospital Surabaya Plastic Surgery Department, with a diagnosis of mandibular condyle fractures during the 3-year period

between from January 2015 to December 2018, were retrospectively reviewed. The inclusion criteria included patients with mandibular condyle fractures who were treated by Plastic Surgery Department at Dr. Soetomo Hospital during January 2015 to December 2018. Excluded were patients who refuse to management of mandibular condyle fractures. The independent variables in this study was patients occlusion. The dependent variable in this study is mandibular condyle fractures.

Statistical analysis was performed using the data that has been obtained from the data collection process will be converted into tables, then the data will be processed using the SPSS (Statistical Package for the Social Sciences) computer program. The statistical test used is a non-parametric statistical test.

### RESULTS

The research data obtained from the medical records of maxillofacial fracture patients handled by Reconstructive and Aesthetic Plastic Surgery, the number of patients with mandibular condyle fractures from January 2015 to December 2018 was 56 patients. The studied showed that male patients (84%) is more than female patients (16%). The mean age of the patients involved in this study was  $28.25 \pm 1.78$  years, with the youngest being 12 years old and the oldest being 67 years old.

This study shows that a total of 56 patients, 22 were patients with mandibular condyle fractures only and 34 patients with mandibular condyle fractures with other maxillofacial fractures. In addition to the type of condyle fracture for the affected side, there were unilateral in 43 patients with unilateral fractures of the mandibular condyle and 13 patients with bilateral fractures of the mandibular condyles. And with 1 patient obtained with mandibular condyle comminuted fracture and 55

patients with simple mandibular condyle fracture. Based on the angulation of the mandibular condyle deviation, 32 patient data did not have a sagittal CT-scan view and 24 patient data with 15 normodivergent, 1 hypodivergent, and 8 hyperdivergent.

From patient management, there are patients with closed reduction and some are with open reduction. Of the 56 cases, a closed reduction of 50% was obtained, and an open reduction also 50% was obtained.

From the fracture type and treatment, the occlusion was found in 56 cases, that is, 48 patients (89.3%) the occlusion returned well. In this result, with mandibular condyle fracture, closed reduction or open reduction with good occlusion results were obtained as many as 10 patients (20.8%) with mandibular condyle fracture and performed closed reduction, 12 patients (25%) with mandibular condyle fracture with Other maxillofacial fractures under closed reduction management. While patients with open reduction treatment with mandibular condyle fracture alone were 13 patients (27.1%) and with mandibular condyle fracture with other maxillofacial fractures who were treated with closed reduction, 13 patients (27.1%) were obtained.

In the results of the above data, there were 8 patients with hyperdivergent mandibular condyle deviation angulsion, 5 patients (62.5%) with closed reduction management and 3 patients (37.5%) with open reduction.

In the overall study results with good occlusion results, it was found that 22 patients were treated with closed reduction and 26 patients with open reduction. The patient was evaluated post op 4 weeks after the procedure. Obtained in the medical records of 2017-2018 from 30 patients with 27 patients who were well occluded at the time of surgery, 27 patients had good occlusion results (unchanged).

### DISCUSSION

Of the 56 cases, 28 cases were found closed reduction and 28 cases open reduction. From

these data, the determination of management based on the type of mandibular condyle fracture was involved or whether other maxillofacial fractures were determined based on simple or complex fractures and one of the indications mentioned by Zide and Kent. Meanwhile, based on the deviation of the mandibular condyle angulation, it was found that 8 patients were hyperdivergent (FMA > 25°), only 3 patients were subjected to open reduction according to the indications mentioned by Mathes. This is because it returns to Zide and Kent's indications where both bilateral and unilateral fractures do not do open reduction if the occlusion is achieved with closed reduction.<sup>2,3,8</sup>

Based on the involvement of the affected side of the fracture, there were more patients with unilateral mandibular condyle fractures (43 patients) than bilateral ones (13 patients). This may occur because the mechanism of severe trauma is only on one side, where as is known the mandible distributes strength from the trauma to the weakest area of the mandible, namely the condyle, causing bending and failure of the bone area to maintain this strength.<sup>7</sup> Based on the study of Sawazaki R et al, it was also found that mandibular condyle fractures were the most common because when the trauma occurred, many of the patients used seat belts or helmets so bilateral rarely happened. In this study, the data obtained did not mention the mechanism of trauma that occurred.<sup>2</sup>

From the type of fracture and treatment, the occlusion results were obtained in 56 cases, that is, 50 patients had good occlusion and only 6 patients had poor occlusion. In these 6 cases, the possibility of a previously poor dental structure was also not included in the data obtained on the state of the teeth before the occurrence of trauma. And also the results of the overall study with good

occlusion results in 48 patients, it was found that 22 patients were treated with closed reduction and 26 patients with open reduction were performed.<sup>1</sup>

The results of the post op evaluation for 4 weeks were obtained in the patient data for 2017 and 2018, namely that the occlusion was still good and was still maintained using an arch bar.

The strength of this study is that the researcher can find out the prevalence rate of mandibular condyle fracture at Dr. Soetomo Hospital, and in general a description of the prevalence rates that occur in Surabaya. In addition, it can determine what factors are used to enforce the management of mandibular condyle fractures

The weakness of this study is that the data from medical records were not completely recorded, therefore data collection was not completely complete. Improvements to the completeness of medical record data are needed in the future

## CONCLUSION

Management of mandibular condyle fractures, both with conservative therapy (closed reduction) and operative therapy (open reduction) can be determined according to the indication with the choice of therapy taking into consider the patient's age, fracture type, patient systemic status, other maxillofacial fractures, and dental conditions. And the results of condyle mandibula fracture management in Dr. Soetomo Hospital has been according to the indication with the treatment indication along with the result of good management.

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## CONFLICT OF INTEREST

The authors have no conflicts of interest in this study.

### FUNDING DISCLOSURE

None.

### AUTHORS CONTRIBUTION

NTP wrote the manuscript and research data. LZ was the idea and methodology, IDS was idea and approved the final manuscript.

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