



## Retrospective Evaluation of Condylar Fractures, Its Epidemiology & Treatment Modalities: Analysis of 63 Cases

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### Abstract

*Fracture of mandibular condyle occurs most commonly by the impact of an indirect traumatic force and is most frequently encountered in mandibular fractures. Conservative treatment such as maxillomandibular fixation (MMF) and physiotherapy as well as open reduction are performed for these fractures. The purpose of this study is to evaluate the epidemiology of condylar fractures and compare the clinical outcome associated with closed and open method of treatment. In our study subcondylar fracture is most common, most frequent age group affected was 21-40 yrs and more than 85% cases were treated with closed reduction without any complications.*

### Introduction

Fracture of mandibular condyle occurs most commonly by the impact of an indirect traumatic force and is most frequently encountered in mandibular fractures<sup>1,2,6</sup>. The proportion of condylar fractures among all mandibular fractures is between 17.5% and 52%<sup>1,2</sup>. Conservative treatment such as maxillomandibular fixation (MMF) and physiotherapy as well as open reduction are performed for these fractures. In our study most mandibular condylar process fractures are treated nonsurgically with maxillomandibular fixation (MMF). The duration of immobilization usually ranges from 2 to 4 weeks, depending on the type of fracture and degree of condylar dislocation. The main reasons for selecting

nonsurgical treatment are the complex anatomy and potential complications related to the surgical approaches to this region.

### Materials and Methods

This is a retrospective study of all patients with condylar fractures attended at the department of oral and maxillofacial surgery, Pacific Dental College, India. The database included epidemiological information as well as treatment and outcome variables. Information includes: age, sex, etiology, site of fracture and method of treatment done.

Diagnosis of fracture was made on bases of detailed history, clinical and radiological examination. Routine laboratory investigations

were carried out before undertaking surgery to evaluate any systemic condition of patients.

**Results**

Total numbers of cases were 63 shown by age and sex distribution, site of condylar fracture. Majority of cases were males 50 (79.37%). Common 20-40 yr age group was affected (46.03%). Majority of fractures were caused by road traffic accident 44 (69.78%), fall 11 (17.46%), work related 6 (9.52%) and personal violence only 3.12%.

Subcondylar fracture was the most common site of fracture (87%). Unilateral condylar fracture was the most common 48 (76.81%) and bilateral fracture was only 15 (23.81%). In unilateral condylar fracture, there was no significant difference on right side (54.17%) or left side (45.83%). Majority of these cases were treated by closed reduction 55 (87.30%). For intermaxillary fixation, used arch bar 44 (80%), eyelets 05 (9.09%), IMF screw 05 (9.09%) and orthodontic bracket 01 (1.82%).

**Table No. 1:** Age distribution

Age (yrs)	Number	Frequency
< 20	8	12.70%
20-39	29	46.03%
40-59	19	30.16%
>59	7	11.11%

**Table No. 2:** Sex distribution

Sex	Number	Frequency
Male	50	79.37%
Female	13	20.63%

**Table No. 3:** Etiology of condylar fracture

Causes	Number	Frequency
Road traffic accident	44	69.78%
Fall	11	17.46%
Interpersonal violance	2	3.12%
Work related	6	9.52%

**Table No. 4:** Site of condylar fracture

Site	Number	Frequency
Bilateral	15	23.81%
Unilateral	R- 26	76.81%
	L- 22	R- 54.17% L- 45.83%

R- right side ; L- left side.

**Table No. 5:** The types and percentages of additional fractures accompanying the condylar fractures

Type of fracture	Number	Frequency
Condylar fracture alone	22	34.92%
Condyle + mandibular symphysis fracture	8	12.70%
Condyle + mandibular parasymphysis fracture	21	33.33%
Condyle + mandibular body fracture	3	4.76%
Condyle + mandibular angle fracture	2	3.17%
Condyle + coronoid fracture	1	1.59%
Condyle + dento-alveolar fracture	2	3.17%
Condyle + angle and parasymphysis fracture	2	3.17%
Condyle + middle third of face	2	3.17%

**Table No. 6:** Treatment of condylar fracture

Treatment	Number		Frequency	
Closed reduction	Arch bar	55	44	87.30%
	eyelet		5	9.09%
	IMF screw		5	9.09%
	Ortho-Bracket		1	1.82%
Open reduction		8		12.70%

**Discussion**

The proportion of condylar fractures among all mandibular fractures is between 17.5% and 52% (Zachariades et al., 1983; Bochlogyros, 1985; Zachariades & Papavassiliou, 1990; Stylogianni et al., 1991; Silvennoinen et al., 1992; Newman, 1998; Marker et al., 2000a; de Riu et al., 2001; Miloro, 2003; Villarreal et al., 2004)<sup>1,3</sup>. Indeed, according to Killey (1974), the most common unilateral fracture is of the condyle, and the most common bilateral fracture is of the condylar heads<sup>2</sup>. According to Villarreal et al. (2004) they are the most controversial fractures regarding diagnosis and management<sup>2</sup>.

Most are not caused by direct trauma, but follow indirect forces transmitted to the condyle from a blow elsewhere. Their displacement is determined by the direction, degree, magnitude and precise point of application of the force, as well as the state of dentition and the occlusal position. With adequate molar support and the teeth in occlusion, little or no displacement is likely to be sustained, while with the mouth widely open the full force

will be transmitted to the condyles (Rowe and Killey, 1968)<sup>4</sup>.

Fracture of the mandibular condylar process occurs by the impact of an indirect traumatic force and is most frequently encountered in mandibular fractures. Conservative treatments such as maxillomandibular fixation (MMF) and physiotherapy as well as open reduction are performed for these fractures condylar process fractures are treated nonsurgically with maxillomandibular fixation (MMF)<sup>5</sup>. The duration of immobilization usually ranges from 2 to 4 weeks, depending on the type of fracture and degree of condylar dislocation. The main reasons for selecting nonsurgical treatment are the complex anatomy and potential complications related to the surgical approaches to this region<sup>6</sup>.

There are two types of fracture, intracapsular and extracapsular (MacLennan, 1969), but for practical purposes, the anatomical level of the fracture is divided into three sites: the condylar head (intracapsular), the condylar neck (extracapsular) and the subcondylar region (Lindahl, 1977; Laskin, 1991; Zhang and Obeid, 1991; Silvennoinen et al., 1992; Newman, 1998; editorial, 1999). The fracture is classified as: undisplaced, deviated, displaced (with medial or lateral overlap, or complete separation), and dislocated (outside the glenoid fossa) (MacLennan, 1969; Lindahl, 1977; Zhang and Obeid, 1991; Silvennoinen et al., 1992; Newman, 1998; Hyde et al., 2002). Lindahl (1977) also classifies condylar head fractures into horizontal, vertical, and compression types<sup>1</sup>.

Causes of trauma are road traffic accident, interpersonal violence, falls, industrial injury but the most common causes of trauma in children are falls from a bicycle, on steps, and sports. If condylar fractures occur in children prior to completion of growth and are not properly managed, growth disturbances and asymmetry at multiple facial levels, including the orbits, cheeks, maxilla, and mandible may result<sup>1,2,3,5,6</sup>.

The clinical signs and symptoms of condylar fracture are facial contusions, abrasions, laceration

of the chin, and /or ecchymosis or hematoma in the TMJ region, bleeding from the external auditory canal, swelling over the TMJ, facial asymmetry, pain and tenderness, crepitation, malocclusion, deviation, muscle spasm, dentoalveolar injuries.

In our study males were most commonly affected and high incidence of road traffic accident as causes of injury in our study. More than 85% cases were treated by closed reduction only.

According to Haug and Assael (2001) there are only few differences in outcome between patients treated with maxillomandibular fixation or rigid internal fixation (Zide and Kent, 1983; Zhang and Obeid, 1991; Konstantinovic and Dimitrijevic, 1992; Moos, 1998; editorial, 1999; Palmieri et al., 1999; Ellis et al., 2000). If the results are equal, the simpler treatment should be preferred (Hayward and Scott, 1993)<sup>3</sup>.

Concerning the variables maximum mouth opening, maximum forced mouth opening and right and left lateral movements, no significant differences were observed<sup>5</sup>.

Malocclusions and jaw deviation on mouth opening after non-surgical therapy of condylar fractures, point towards a stronger indication for surgical repositioning and rigid internal fixation of condylar fractures in selected patients<sup>3,4</sup>. Yet, one has to consider the disadvantages as well: surgery on these patients is often difficult and time consuming; unwanted side effects including visible scars, wound infection and damage to the facial nerve are not always unavoidable (Banks, 1998; Eckelt and Hlawitschka, 1999; Ellis et al., 2000b)<sup>5</sup>.

### Conclusion

We concluded that subcondylar fractures are most common. Various treatment modalities are available for management of condylar fracture like surgical or non-surgical treatment. But open reduction has a higher incidence of mild-transient morbidity following surgery. Acceptable functional outcome with closed reduction that permit full pain free function with good occlusion.

**References**

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