

Original Research

Assessment of temporomandibular joint ankylosis secondary to surgical treatment of mandibular condylar fractures: A clinical study

¹Dr Sarish Latief, ²Dr Ashiq H Ansari, ³Dr Muneeba Lateaf

^{1,2}PG student, Department of Oral and Maxillofacial Surgery, BRS Dental College and General Hospital, Haryana, India;

³BDS, Private Consultant, J & K

ABSTRACT:

Background: The present study was conducted for assessing temporomandibular joint ankylosis secondary to surgical treatment of mandibular condylar fractures. **Materials & methods:** A total of 40 patients with presence mandibular condylar fractures were enrolled. Complete demographic and clinical details of all the patients were obtained. All the patients underwent open treatment for the condylar fractures. Details of any patient who developed ankylosis were also noted and risk factors were analysed. Patients who had a history of other surgical treatment of the TMJ or diseases known to cause ankylosis were excluded. The type of postoperative ankylosis was categorised. In all cases the medical histories and radiographs were reviewed. **Results:** Overall, TMJ ankylosis was seen in 12.5 percent of the patients. Among these 12.5 percent of the patients, bilateral removal of fragment was done in 7.5 percent of the patients while open reduction with internal fixation was done in 5 percent of the patients. **Conclusion:** TMJ ankylosis is significant postoperative problem encountered among patients undergoing surgical treatment for mandibular condylar fractures.

Key words: Ankylosis, Condyle, mandibular

Received: 24 April, 2021

Accepted: 26 May, 2021

Corresponding author: Dr Sarish Latief, PG student, Department of Oral and Maxillofacial Surgery, BRS Dental College and General Hospital, Haryana, India

This article may be cited as: Latief S, Ansari AH, Lateaf M. Assessment of temporomandibular joint ankylosis secondary to surgical treatment of mandibular condylar fractures: A clinical study. J Adv Med Dent Scie Res 2021;9(6):245-247.

INTRODUCTION

Approximately 11–16% of all facial fractures and 30–40% of all mandibular fractures (MFs) are fractures of the mandibular condyle. Most are not caused by direct trauma, but follow indirect forces transmitted to the condyle from a blow elsewhere. There are two principal therapeutic modalities for these fractures: non-surgical (functional) and surgical. Historically, non-surgical treatment of MCFs by means of maxillomandibular fixation (MMF) followed by physiotherapy was the standard practice.¹⁻³

The proponents for non-surgical management of condylar fractures have given reasons like reduced overall morbidity, acceptable occlusal results in most cases, avoidance of any of typical surgical complications, a simpler procedure and less risk of ankylosis and avascular necrosis.⁴⁻⁶

Many oral and maxillofacial surgeons have reported complications after operative treatment of mandibular condylar fractures, including facial nerve palsy, auriculotemporal nerve dysfunction, Frey's syndrome,

salivary fistulas, limitation of mouth opening, occlusion disorders, loosening of miniplates or screws, torsion or fracture of the miniplate, changing position of the condylar fragment, resorption and remodelling of the condylar process, osteoarthritis, infection, and unsightly scars.⁷⁻⁹ Hence; the present study was conducted for assessing temporomandibular joint ankylosis secondary to surgical treatment of mandibular condylar fractures.

MATERIALS & METHODS

The present study was conducted for assessing temporomandibular joint ankylosis secondary to surgical treatment of mandibular condylar fractures. A total of 40 patients with presence mandibular condylar fractures were enrolled. Complete demographic and clinical details of all the patients were obtained. All the patients underwent open treatment for the condylar fractures. Details of any patient who developed ankylosis were also noted and risk factors were analysed. Patients who had a history of other

surgical treatment of the TMJ or diseases known to cause ankylosis were excluded. The type of postoperative ankylosis was categorised. In all cases

the medical histories and radiographs were reviewed. All the results were recorded and analysed by SPSS software.

RESULTS

In the present study, a total of 40 patients were analysed. Mean age of the patients was 41.8 years. Out of 40 patients, 29 were males and 11 were females. Assault was the most common etiologic agent of injury responsible for ankylosis. Overall, TMJ ankylosis was seen in 12.5 percent of the patients. Among these 12.5 percent of the patients, bilateral removal of fragment was done in 7.5 percent of the patients while open reduction with internal fixation was done in 5 percent of the patients.

Table 1: Temporomandibular ankylosis secondary to surgical treatment

Type of treatment	Number of patients with ankylosis	Percentage
Open reduction with internal fixation	2	5
Bilateral removal of fragment	3	7.5
Overall	5	12.5

DISCUSSION

Fracture of the mandibular condyle is reported to be one of the most common type of fracture. Its frequency ranges from 28% to 62%. It is suggested that, if not properly managed, condylar fractures in children may give rise to serious problems (eg. malocclusion, temporomandibular dysfunction, disturbed mandibular growth and ankylosis of the temporomandibular joint [TMJ]). For condylar fractures, there are two principal therapeutic approaches: functional and surgical. In adult patients, mandibular function and condylar remodelling was better improved after operative treatment. However, it is widely accepted that conservative or functional treatment is the first choice in the management of condylar fractures in children. This is because condylar regeneration and remodelling with adaptive changes will lead to functional restitution of the TMJ. Also, surgeons are concerned that surgery will cause a growth disturbance either from the surgical manipulation of the fracture segments or from the placement of rigid hardware across the condylar process.⁶⁻¹⁰ Hence; the present study was conducted for assessing temporomandibular joint ankylosis secondary to surgical treatment of mandibular condylar fractures.

In the present study, a total of 40 patients were analysed. Mean age of the patients was 41.8 years. Out of 40 patients, 29 were males and 11 were females. Assault was the most common etiologic agent of injury responsible for ankylosis. Overall, TMJ ankylosis was seen in 12.5 percent of the patients. Guo-lin Xiang investigated the incidence of ankylosis of the temporomandibular joint (TMJ) after open operations for fractures of the mandibular condyle, and analysed possible risk factors in a total of 385 patients with 492 condylar fractures who had been operated on in our department from 2001 to 2010. Sixteen patients developed postoperative ankylosis of the TMJ with 26 joints (5%) affected during a follow-up of 6 months-10 years. Of the 492 condylar fractures, the most common ones that were associated with postoperative ankylosis were those of

the condylar head (20/248), followed by the condylar neck (6/193). Subcondylar fractures did not cause postoperative ankylosis (0/51). Among the 16 patients with postoperative ankylosis, 13 had associated anterior mandibular fractures. Long-screw (bicortical screw) fixation of fractures of the condylar head seemed to be associated with a lower incidence of postoperative ankylosis than fixation by miniplate and wire or removal of the fractured fragment. The articular discs were damaged in all ankylosed joints, and the remaining fractured fragment was found in 10 ankylosed joints after fractures of the condylar head. The results suggested that fractures of the condylar head are more prone to lead to postoperative ankylosis of the TMJ, and that the possible risk factors seem to include the technique used for fixation and damage to the disc, together with an anterior mandibular fracture with the fractured fragment remaining.¹¹

In the present study, among these 12.5 percent of the patients with presence of TMJ ankylosis, bilateral removal of fragment was done in 7.5 percent of the patients while open reduction with internal fixation was done in 5 percent of the patients. Dongmei He et al analyzed the main causes of temporomandibular joint (TMJ) ankylosis from condylar fracture in adults through a retrospective study. The history and computed tomographic (CT) scans of patients diagnosed with ankylosis caused by mandibular condyle fracture treated in a closed fashion were reviewed. Of the 51 patients diagnosed with TMJ ankylosis, 13 patients (24 ankylosed joints) had full CT scans from injury to ankylosis, which showed that all condylar fractures were intracapsular fractures (ICFs), with sagittal fractures comprising 70%. Regarding the relation between the stump of the ramus and the TMJ fossa, no joints were classified as grade 0 (0%), 10 joints were classified as grade 1 (41.7%), and 14 joints were classified as grade 2 (58.3%). All discs were displaced with the fracture fragment, and the posterolateral retrodiscal tissue was torn. Among the condyle fractures leading to ankylosis, 77% featured symphysis fractures with widening of the mandibular arch. The relation

between the ramus stump and the TMJ fossa plays an important role in the prognosis of condylar fracture.¹²

CONCLUSION

TMJ ankylosis is significant postoperative problem encountered among patients undergoing surgical treatment for mandibular condylar fractures.

REFERENCES

1. Dimitroulis G: Condylar injuries in growing patients. *Aust Dent J* 42: 367e371, 1997
2. Eckelt U, Schneider M, Erasmus F, Gerlach KL, Kuhlisch E, Loukota R, et al: Open versus closed treatment of fractures of the mandibular condylar process e a prospective randomized multi-centre study. *J Craniomaxillofac Surg* 34: 306e314, 2006
3. Ellis III E: Complications of mandibular condyle fractures. *Int J Oral Maxillofac Surg* 27: 155e157, 1998
4. Tominaga K, Habu M, Khanal A, Mimori Y, Yoshioka I, Fukuda J (2006) Biomechanical evaluation of different types of rigid internal fixation techniques for subcondylar fractures. *J Oral Maxillofac Surg* 64:1510–1516
5. Ellis E III, Dean J (1993) Rigid fixation of mandibular condyle fractures. *Oral Surg Oral Med Oral Pathol* 76:6–15
6. Throckmorton GS, Dechow PC (1994) In vitro strain measurements in the condylar process of the human mandible. *Arch Oral Biol* 39:853–867
7. Meyer C, Kahn JL, Boutemi P, Wilk A (2002) Photoelastic analysis of bone deformation in the region of the mandibular condyle during mastication. *J Craniomaxillofac Surg* 30:160–169
8. Choi BH, Kim KN, Kim HJ, Kim MK (1999) Evaluation of condylar neck fracture plating techniques. *J Craniomaxillofac Surg* 27:109–112
9. Güven O, Keskin A: Remodelling following condylar fractures in children. *J Craniomaxillofac Surg* 29: 232e237, 2001
10. Hovinga J, Boering G, Stegenga B: Long-term results of nonsurgical management of condylar fractures in children. *Int J Oral Maxillofac Surg* 28: 429e440, 1999
11. Guo-lin Xiang et al. A retrospective study of temporomandibular joint ankylosis secondary to surgical treatment of mandibular condylar fractures. *Br J Oral Maxillofac Surg*. 2014 Mar;52(3):270-4.
12. Dongmei He, Yihua Cai , Chi Yang . Analysis of temporomandibular joint ankylosis caused by condylar fracture in adults. *J Oral Maxillofac Surg*. 2014 Apr;72(4):763.e1-9.