ORIGINAL RESEARCH

Assessment of Mandibular Function using Mandibular Function Impairment Questionnaire after Closed Treatment of Unilateral Mandibular Condyle Fractures

Sudheesh K M[1], Rajendra Desai[2], Siva Bharani K S N[3], Nandini Katta[4]

1-Assistant Professor, Department of Oral and Maxillofacial Surgery, College of dental sciences, Davangere, Karnataka, India. 2-Senior professor, Department of Oral and Maxillofacial Surgery, College of dental sciences, Davangere, Karnataka, India. 3-Professor and Head, Department of Oral and Maxillofacial Surgery, College of Dental Sciences, Davangere, Karnataka, India. 4-Assistant Professor, Department of paediatric and preventive dentistry, College of dental sciences, Davangere, Karnataka, India.

Correspondence to:
Dr. Sudheesh K M, Department of Oral and Maxillofacial Surgery, Room no 2, College of Dental Sciences, Davangere, Karnataka, India.
Contact Us: www.ijohmr.com

ABSTRACT

Objectives: The topic of mandibular condylar injury has generated more discussion and controversy than any other in the field of maxillofacial trauma. The purpose of the present study is to analyze the outcome of closed treatment of unilateral condylar fractures based on patient complaints using a questionnaire. **Methods:** 30 Patients with unilateral condylar fractures treated by the nonsurgical method in the department of Oral and maxillofacial surgery, college of dental sciences, from the year 2011 were administered mandibular function impairment questionnaire (MFIQ) with scoring range 0-68 and mandibular Function was assessed after nonsurgical treatment of unilateral condylar fractures. **Results:** In our present study at 6 months postoperatively out of 30 patients 19 (63.3%) had MFIQ score (FIRS) < 1 and 11 (36.7%) had MFIQ score (FIRS) =1. At 12 months 29 (96.7%) had (FIRS) < 1 and 1 (3.3%) had MFIQ score (FIRS) =1). **Conclusion:** A low level of mandibular function impairment exists after closed reduction of fractures of the mandibular condyle as assessed by the MFIQ.

KEYWORDS: Mandibular, Condyle, Fracture, MFIQ, Closed

INTRODUCTION

One of the most common maxillofacial fractures are mandibular fractures(57%).[1] 18-57% of all mandibular fractures are fractures of the mandibular condyle.[1,2,3,4,5,6] Treatment of mandibular condyle fracture is decided based on clinical as well as radiological evidence for the presence of the fracture, extent of the injury, fracture level, degree of displacement or dislocation, presence of any additional facial fracture, dental malocclusion and mandibular dysfunction, posterior occlusal support, clinical expertise of the surgeon and sometimes based on willingness of the patient to undergo surgery.[4,6,7] Closed treatment is recommended many times to avoid problems associated with surgical approach such as infection, nerve injury, blood vessel injury, and scar formation.[8,9,10] Complications associated with condylar fracture and its treatment are malocclusion, loss of ramus height, ankylosis, chronic pain, crepitation anterior open bite, joint pain reduced mandibular function, hypomobility, deviation on mouth opening, and facial nerve injury.[3, 4,6,7,11] Choosing the best treatment for a single patient requires careful consideration of the fracture type and patient characteristics. [4 ,6,7]

The purpose of the present study was to analyze the outcome of closed treatment of unilateral condylar fractures based on patient complaints using a questionnaire.

MATERIALS AND METHODS

Patients with unilateral condylar fractures treated by nonsurgical method in the department of Oral and maxillofacial surgery, college of dental sciences, from the year 2011 were selected for the study. The study was done between 2011 and 2014. Personal details of these patients including name, age, sex, address, telephone numbers and fracture sites were obtained from the patient admission register of department of oral and maxillofacial surgery. They were contacted on telephone, explained about the study and invited to the department of oral and maxillofacial surgery if they were willing to participate in the study. Participants were recalled at 6 months and 12 months follow up. All participants were given a covering letter including information such as the department behind the study, name and address of the researcher, details of the method and why the respondent was selected, the aims of the study, any potential harm or benefits by participating in the study, and what will happen to the information. Informed consent was obtained from all patients.

The patients were requested to fill out the mandibular function impairment Questionnaire (MFIQ). The MFIQ is designed to assess the patient's perception of mandibular

How to cite this article:
Sudheesh KM, Desai R, Siva Bharani KSN, Katta N. Assessment of Mandibular Function using Mandibular Function Impairment Questionnaire after Closed Treatment of Unilateral Mandibular Condyle Fractures. Int J Oral Health Med Res 2016;3(1):28-30.

function impairment. It has 17 items and each item is presented with a 5 point Lickert scale. On this scale the patient can indicate how much difficulty was experienced while performing a particular mandibular movement or task. The scores of the Lickert scale are; 0 = no difficulty, 1 = a little difficulty, 3 = much difficulty, 4 = very difficult or impossible without help. The MFIQ also consists of a scoring range from 0 to 68, where 0 indicates no mandibular function impairment. Using these scores a Raw Component Score is calculated and a functional impairment rating scale (FIRS) is derived (0-5). An FIRS = 0 or 1 indicates low level of function impairment, FIRS = 2 or 3 indicates moderate level of function impairment and FIRS = 4 or 5 indicates severe level of function impairment (Table1 And Table 2).[12]

Ethical clearance was obtained from College of Dental Sciences, Davangere.

ANSWERS	SCORE
No difficulty	0
A little difficulty	1
Quite a bit of difficulty	2
Much difficulty	3
Very difficult or impossible without help	4

Table 1 – Scoring Key

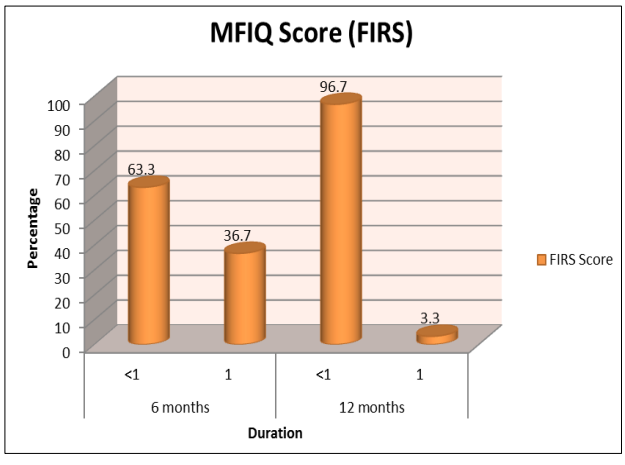
Qualitative Function Impairment Level	
FIRS = 0 or 1	Low
FIRS = 2 or 3	Moderate
FIRS = 4 or 5	Severe

Table 2: Qualitative Level of Function Impairment

RESULTS

35 patients with unilateral condylar fractures were treated nonsurgically from 2011 to 2014. 30 patients participated in the study. Three patients were contacted on telephone as they were discharged from the hospital after treatment. The other patients were informed directly about the study during their hospital stay. 2 patients were not present for the 12 months follow up. For these patients the values at 6 months were carried forward.

Graph 1 shows the MFIQ scores recorded at 6 months and 12 months postoperatively.



Graph 1: MFIQ scores

In the current study, at 6 months postoperatively 19 patients (63.3%) had MFIQ score (FIRS) < 1 and 11 patients (36.7%) had MFIQ score (FIRS) =1. At 12 months postoperatively out of 30 patients 29 (96.7%) had MFIQ score (FIRS) < 1 and 1 (3.3%) had MFIQ score (FIRS) = 1. No patient had MFIQ score more than 1.

DISCUSSION

Though great consensus is available for nonsurgical approach to condylar fractures in children, condylar fracture treatment in adults is still a highly debated issue. Most surgeons seem to favor nonsurgical treatment of condylar fractures.[13] The MFIQ appears to be a reliable and valuable complementary tool to assess mandibular function. The authors used the MFIQ to assess mandibular function in patients with TMJ osteoarthrosis and internal derangement.[12] In another study MFIQ was used to assess the functional outcome related to oral and oropharyngeal cancer.[14] In the present study MFIQ was used to assess the function of mandible after closed treatment of condylar fractures.

In a prospective cohort study by Niezen ET et al, the MFIQ was used to assess the function of mandible and the patient complaints were assessed during physical examination. A logistic regression analysis was done and MFIQ scores more than zero was considered as a dependent variable. The mean (SD) MFIQ score was 3.4 points (7.3). This score was the mean of all the scores for each question in the questionnaire. The predictors of mandibular function impairment were increased age, pain, moderate or poor perceived occlusion, absolute difference between left lateral movement and right lateral movement of the mandible and reduction in mouth opening.[15]

In a randomized control trial, the mean MFIQ score in the closed treatment group was 10.5 points (SD 12.1) and in the open reduction group 2.5 points (SD 4.6).[16] A reason for such relatively large difference in the results between the two studies may be because the authors centre in the prospective cohort study may have been more focused on closed treatment procedures and the centers participating in RCT more focused on open reduction.

In the current study, at 6 months postoperatively out of 30 patients 63.3% had MFIQ score (FIRS) < 1 and 36.7% had MFIQ score (FIRS)=1. At 12 months postoperatively 96.7% had MFIQ score (FIRS) < 1 and 3.3% had MFIQ score (FIRS)=1. Patients experienced a low level of functional impairment at 6 months and 12 months postoperatively after closed treatment of condylar fracture. For efficient and maximal functioning of the masticatory system, a craniomandibular articulation is necessary. Whether or not it must be in the form of a ginglymoarthrodial joint or whether a simple hinge joint is adequate is unclear. It is also unclear whether a more effective temporomandibular articulation is provided by open treatment than closed treatment. One must weigh the risk of open surgery against the possible improvement in outcomes. Not just surgical risks, but biological risks

such as the disruption of the blood supply to the condyle can also lead to resorption/ remodeling as well[17]. Lindahl and Hollender radiographically demonstrated the ability of a new condylar process to regenerate after closed treatment of condylar process fractures. They showed that individuals who were young at the time of injury almost completely regenerate a new condylar process. This adaptation is called "restitutional" remodeling, which indicates that a completely new condylar process of normal morphology is re-created. However, as the age advances, the condylar process has less robust remodeling ability at the time of injury and the regenerated condylar process has atypical morphology, even years later. This is called "functional" remodeling, indicating that the condylar process looks abnormal even though it might function very well.[18] Hjorth et al similarly showed that most of the muscles in patients treated for condylar process fractures tend to get normalized with time, although some asymmetry of the masseter muscles occurred even after up to 1 year.[19]

CONCLUSION

It can be concluded that a low level of mandibular function impairment exists after closed treatment of unilateral mandibular condylar fractures based on patient complaints. If the risks of surgery overweigh the functions of mandible, then a conservative approach should be chosen because over a period of time neuromuscular, skeletal and dental adaptations occur. Patients get adapted to these changes avoiding a need for surgery. But the indications and contraindications of open reduction and internal fixation should always be considered before treating every case. More studies of assessment of mandibular function using MFIQ comparing open and closed treatments are required to consider 'patient complaints' as an individual assessment tool for evaluating outcome of non surgical treatment of condylar fractures.

REFERENCES

1. Iida S, Kogo M, Sugiura T, Mima T, Matsuya T. Retrospective analysis of 1502 patients with facial fractures. Int J Oral Maxillofac Surg 2001: 30: 286-290
2. Maladiere E, Bado F, Meningaud JP, Guilbert F, Bertrand JC. Aetiology and incidence of facial fractures sustained during sports: a prospective study of 140 patient. Int J Oral Maxillofac Surg 2001: 30: 291-295
3. Andersson J, Hallmer F, Eriksson L. Unilateral mandibular condylar fractures: a 31-year follow up of non-surgical treatment. Int. J. Oral Maxillofac. Surg. 2007; 36: 310-314
4. Jenson T, Jenson J, Norholt SE, Dahl M, Lenk-Hansen L, Svensson P. open reduction and rigid internal fixation of mandibular condylar fractures by an intraoral approach: a long term follow up study of 15 patients. J Oral Maxillofac Surg 2006: 64: 1771-1779.
5. Van Beek GJ, Merkx CA. Changes in the pattern of fractures of the maxillofacial skeleton. Int J Oral Maxillofac Surg 1999: 28: 424-428.
6. Zachariades N, Mezitis M, Mourouzis C, Papadakis D, Spanou A, Fractures of the mandibular condyle: A review of 466 cases. Literature review, reflections on treatment and proposals J Craniomaxillofac Surg 2006: 34: 421–432.
7. Landes CA, Day K, Lipphardt R, Sader R. closed versus open operative treatment of nondisplaced, dicapitular (Class VI) fractures. J Oral Maxillofac Surg 2008: 66: 1586-1594.
8. Zide MF, Kent JN. Indications for open reduction of mandibular condyle fractures. J Oral Maxillofac Surg 1983; 41: 89-98.
9. Goss AN, Bosanquet AG. The arthroscopic appearance of acute temporomandibular joint trauma. J Oral Maxillofac Surg 1990; 48: 780-783.
10. Wood GD. Assessment of function following fracture of the mandible. Br Dent J 1980; 149: 137-141.
11. Haug RH, Brandt MT. Closed reduction, open reduction and endoscopic assistance: current thoughts on the management of mandibular condyle fractures. Plast Reconstr Surg 2007: 120: 90S-102S.
12. Stegenga B, DE Bont LG, DE Leeuw R, Boering G. assessment of mandibular function impairment associated with temporomandibular joint osteoarthritis and internal derangement. J Orofac Pain 1993: 7: 183-195.
13. Palmieri C, Ellis E III, Throckmorton G. Mandibular Motion After Closed and Open Treatment of Unilateral Mandibular Condylar Process Fractures. J Oral Maxillofac Surg 1999: 57: 764-775.
14. Oral symptoms and functional outcome related to oral and oropharyngeal cancer Jolanda I. Kamstra & Harriet Jager-Wittenaar & Pieter U. Dijkstra & Paulien M. Huisman & Rob P. van Oort & Bernard F. A. M. van der Laan & Jan L. N. Roodenburg Support Care Cancer (2011) 19:1327–1333
15. Niezen ET, Bos RRM, De Bont LGM, Stegenga B, Dijkstra PU. Complaints related to mandibular function impairment after closed treatment of fractures of the mandibular condyle. Int. J. Oral Maxillofac. Surg. 2010; 39: 660-665.
16. Eckelt U, Schneider M, Erasmus F, Gerlach KL, Kuhlisch E, Loukota R, Rasse M, Schubert J, Terheyden H. Open versus closed treatment of fractures of the mandibular condylar process–a prospective randomized multi-centre study. J Craniomaxillofacial Surg 2006: 34: 306-314.
17. Treatment of Mandibular Condylar Process Fractures: Biological Considerations Edward Ellis III, DDS, MS* and Gaylord S. Throckmorton, PhD† J Oral Maxillofac Surg 63:115-134, 2005
18. Lindahl L, Hollender L: Condylar fractures of the mandible. II. Radiographic study of remodeling processes in the temporomandibular joint. Int J Oral Surg 6:153, 1977
19. Hjorth T, Melsen B, Moller E: Masticatory muscle function after unilateral condylar fractures: A prospective and quantitative electromyographic study. Europ J Oral Sci 105:298, 1997

Source of Support: Nil
Conflict of Interest: Nil