

ASSESSMENT OF TMJ DYSFUNCTION IN CONDYLAR FRACTURE OF THE MANDIBLE USING THE HELKIMO INDEX: AN OBSERVATIONAL STUDY.

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Abstract

Aim: To assess the results of management of patients treated for condylar fracture of the mandible using the Helkimo index.

Materials and Methods: This cross sectional study was carried out in the Department of Burn and Plastic Surgery at Government Medical College and Hospital, Bettiah, Bihar, India from may 2017 to Jan 2018. A total of 50 treated patients with fracture of the mandibular condyle who underwent examination as per the Helkimo index. Their dysfunction was quantified and clinicoepidemiological characteristics were assessed. It was found that majority of our patients were young males involved in a two-wheeler accident.

Results: A total of 50 condylar fracture treated patients were included in the study. Nearly 70 % were in the age group of 20–30 years and 30–50 years accounted for another 30% of the patients. Nearly 76% had high condylar and 24% had low condylar fractures. Around 80% had unilateral condylar fractures. Condylar dislocation was observed in 20% of patients. All patients underwent IMF as the minimum treatment and 30% underwent ORIF in addition. In the Helkimo clinical dysfunction index, there was no dysfunction in 12%, mild dysfunction in 64% and moderate dysfunction in 24% of cases.

Conclusion: The Helkimo Index is a simple, effective, inexpensive, reliable screening index to assess TMJ dysfunction in condylar fractures of mandible.

Keywords: Helkimo Index, Condylar Fractures, Mandible, IMF

Introduction

Faciomaxillary injuries form an integral part of surgical trauma. Facial fractures can have long-term consequences, both functionally and esthetically. Condylar fractures assume more significance due to the high risk of developing temporomandibular joint (TMJ) dysfunction.¹ There have been few long-term surveys of functional outcome after condylar fractures of mandible, making an assessment of TMJ dysfunction quite challenging. TMJ dysfunction is a generic term for a number of clinical signs and symptoms involving the masticatory muscles, the TMJs and associated structures. Functional disturbances of the masticatory system in children and adolescents are common and seem to increase with age into adulthood. Furthermore, a high frequency of clinical signs of dysfunction (e.g., clicking and tenderness of masticatory muscles on palpation) as well as subjective symptoms has been reported in patients with TMJ dysfunction. Although the cause of TMJ dysfunction is obviously multifactorial, malocclusion secondary to mandibular condyle fracture is considered to be one of the main causes.²

There is no standard systematic tool in place to study the functional status of treated condylar fractures; it is only based on a few symptoms and signs. The Helkimo index

consists of two parts – the anamnestic index, which is a structured questionnaire, and clinical dysfunction index which is based on clinical examination. This index has withstood the test of time since it is simple, practical, quantifies the dysfunction present and allows for correlation between the patient's symptoms and clinical finding, as compared to other clinical indices.³ The goal of this study was to assess the results of management of patients treated for condylar fracture of the mandible using the Helkimo index and determine its status as a systematic tool for its routine use to assess functional status in patients with treated condylar fracture.

Material and methods

This prospective cross sectional study was carried out in the Department of Burn and Plastic Surgery at Government Medical College and hospital Bettiah, Bihar, India from may 2017 to Jan 2018, after taking the approval of the protocol review committee and institutional ethics committee.

After taking informed consent detailed history was taken from the patient or the relatives if the patient was not in good condition.

Methodology

All 50 patients presenting to the Department of Burn and Plastic Surgery with condylar fracture of the mandible with or without associated condylar dislocation (subluxation and dislocation) were included in the study. The excluded patients were patients below 5 years of age, patients having psychiatric or debilitating neurological diseases, incomplete case records for eliciting demographic data and patients whose contact details were unavailable. Patients underwent treatment as per the standard institutional protocol, that is all patients with condylar fracture should undergo intermaxillary fixation (IMF) as the minimum treatment. Open reduction and internal fixation (ORIF), in addition, is done in bilateral dislocated fractures, displaced subcondylar fractures and grossly displaced high fractures. After 10 weeks of surgery, the patients were explained about the study, informed consent was obtained and an interview by a pre-validated structured questionnaire, as per the Helkimo index. Then, the patient underwent a detailed clinical examination by the investigator as per the Helkimo's clinical dysfunction index.

Results

Table 1: Demographic profile

Parameter	N=50	%
Gender		
Male	40	80
Female	10	20
Age		
20-30 year	35	70
30-40year	12	24
40-50 year	3	6
RTA	40	80
Falls	6	12
Others	4	8

Table 2: Associated condylar dislocation

Associated condylar dislocation	N=50	%
Condylar dislocation	10	20
No Condylar dislocation	40	80

Table 3: Surgical procedure

Procedure	N=50	%
IMF only	35	70
IMF & ORIF	15	30

Table 4: Helkimo's anamnestic dysfunction index

Helkimo's anamnestic dysfunction index	N=50	%
AL ₀	25	50
AL ₁	16	32
AL ₂	9	18

Table 5: Helkimo clinical dysfunction index

Helkimo clinical dysfunction index	N=50	%
DL0	6	12
DL1	32	64
DL2	12	24
DL3	-	-

Table 6: Association of clinical dysfunction with condylar dislocation

Clinical dysfunction	Condylar Dislocation		Total	p-value
	Present	Absent		
No dysfunction	00	6	6	0.034 (Sig.)
Mild dysfunction	3	29	32	
Moderate dysfunction	7	5	12	
Total	10	40	50	

Test applied: chi-square test

Table 7: Association of clinical dysfunction with surgical procedure

Clinical dysfunction	IMF only	IMF & ORIF	Total	p-value
Mild dysfunction	9	23	32	
Moderate dysfunction	4	8	12	
Total	15	35	50	

Test applied: chi-square test

Discussion

In our study, the epidemiological data such as age distribution, sex distribution, mechanism of injury and contributing factors were comparable to other Indian and Asian data, possibly suggesting similar injury circumstances in the Indian subcontinent as compared to different areas in the Western world.

Associated injuries seen in our study were comparable to other studies. In our study, a majority of the patients had high condylar fractures, which shows variation across different studies. However, most studies, including ours, show a majority of the condylar fractures to be unilateral. Condylar dislocation is considered to be one of the indicators of the severity of injury, and our incidence of 20% was similar to that of other international studies. All our patients underwent IMF. Around 30% of the patients in our series needed to undergo ORIF in addition.

IMF is the basic, standard treatment followed worldwide, also supported with a study by Zachariades *et al.*, who reported that conservative treatment with or without IMF, is the treatment of choice in majority of the patients.⁴

The Helkimo anamnestic index is based on the patients' symptoms; a majority of our patients were asymptomatic. A study by Köhler *et al.*⁵ showed similar results, but Leuin *et al.*⁶ reported a majority in their series having moderate symptoms. The most important indicator of TMJ dysfunction is the clinical dysfunction index and most comparisons are based on this categorisation. In this, a majority had mild dysfunction in our study, which was similar to a study by Härtel *et al.*⁷ and Borgiel-Marek *et al.*⁸ We found that those patients with condylar dislocation in addition to condylar fracture had significantly more dysfunction, than those with only a

condylar fracture as seen in the series of Zhou *et al.*⁹ and Zachariades *et al.*⁴

There was no statistically significant difference between those who underwent IMF and ORIF as compared with those who underwent IMF only. Kyzas *et al.* in 2012 published one of the largest meta-analyses of comparison between conservative (IMF) and conservative-surgical treatments (IMF and ORIF) of condylar fractures of mandible. It included four randomised trials and 16 non-randomised trials. They concluded that ORIF is as good as conservative treatment in most cases of condylar fracture of mandible, provided open reduction was done for specific indications only.¹⁰ In our study, the decision to do an ORIF is based on specific indications as a protocol. Those patients with bilateral dislocated fractures displaced low condylar fractures, and grossly displaced high fractures were considered for surgery. Although ORIF is done, IMF screws are applied in these patients due to the following reasons:

It reduces immediate post-operative pain, In case immobilisation is deemed necessary-as in the case of pain, etc., loops or elastics can easily be applied in outpatient setting

Guiding elastics can be applied during rehabilitation, In case occlusion is deranged in post-operative setting (muscle spasm or redislocation), loops/elastics can be applied.

Based on these specific criteria and indications, we found that conservative treatment (IMF) was as good as conservative surgical treatment (IMF and ORIF) with regard to the clinical TMJ dysfunction, a finding in the above-mentioned studies too.

Our study showed no significant correlation between anamnestic index and clinical dysfunction index. It can be inferred that, although the patient may sometimes give no history of any symptoms, there might be subclinical dysfunction, which can only be diagnosed using the clinical dysfunction index. Thus, although the patient may not report any symptom, it becomes imperative to examine the patient using the clinical dysfunction index to diagnose this subclinical dysfunction and to quantify it. Another observation is that, if a patient complains of significant symptoms, it may not always be severe on examination. Reassurance and mouth opening exercises are all that may be required to tackle the problem. Following a fracture of

the mandibular condyle, most patients will experience or develop some degree of dysfunction although far fewer complain of it. However, in this study, all the patients having an associated condylar dislocation reported having a moderate dysfunction of the TMJ at 10 weeks or later.

Conclusion

The present study concluded that the Helkimo index is a simple, effective, inexpensive, reliable screening index to assess TMJ dysfunction in condylar fractures of mandible. Due consideration regarding routine clinical use can be given in view of the lack of gold standard clinical criteria to diagnose and prognosticate TMJ dysfunction in patients with condylar fractures of the mandible.

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