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Original Research Article

A Descriptive Observational Assessment of the Temporomandibular Joint Dysfunction in Condylar Fracture of the Mandibleu the Helkimo Index

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Abstract:

Aim: The aim of the present study was to assess the temporomandibular joint dysfunction in condylar fracture of the mandible using the Helkimo index.

Methods: The present study was a cross‑sectional descriptive study from July 2019 to August 2021. A total of 20 condylar fracture treated patients were included in the study. All patients presenting to the department of plastic and reconstructive surgery with condylar fracture of the mandible with or without associated condylar dislocation (subluxation and dislocation).

Results: Nearly 60% were in the age group of 18–30 years and 31–50 years accounted for another 30% of the patients. There were 90% male as compared to females. Road traffic accidents accounted for 90% and falls accounted for 5% of the cases. Around 80% had unilateral condylar fractures. Condylar dislocation was observed in 20% of patients. 25% patients underwent IMF only and 75% underwent IMF and ORIF surgery procedure. As per the Helkimo's anamnestic index, 45% had no symptoms, 30% had mild symptoms and 25% had severe symptoms. In the clinical Helkimo dysfunction index, there was no dysfunction in 10%, mild dysfunction in 60% and moderate dysfunction in 30% of cases. None had severe dysfunction.

Conclusion: 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.

Keywords: Helkimo index; mandible condyle fractures; temporomandibular joint dysfunction

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]

In recent years, an increase in reports on the late complications of soft tissue dislocation has slowed the promotion of closed treatments. In contrast, increasing attention has been given to open treatment, which can decrease late complications and largely restore TMJ functions. It is universally acknowledged that CHFs are always combined with injury of associated soft tissues, such as disc displacement and tears in the capsule and retrodiscal tissue. [4-7] Notably, disc displacement is the most detrimental problem, causing complications such as ankyloses, lateral deviation, and chronic pain, to name just a few. Surgical treatment allows not only open reduction and internal fixation of the displaced fragment, but also repositioning of the displaced disc and reparation of retrodiscal tissue and capsule injury. [8,9]

The aim of the present study was to assess the temporomandibular joint dysfunction in condylar fracture of the mandible using the Helkimo index.

Materials and Methods

The present study was a cross‑sectional descriptive study from July 2019 to August 2021 at Nalanda Medical College and Hospital, Patna, Bihar, India. A total of 20 condylar fracture treated patients were included in the study. All patients presenting to the department of plastic and reconstructive surgery with condylar fracture of the mandible with or without associated condylar dislocation (subluxation and dislocation) from October 2015 to August 2021 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 sub condylar fractures and grossly displaced high fractures. After 8 weeks of surgery, the patients were explained about the study, informed consent was obtained and an interview by a structured pre‑validated questionnaire, as per the Helkimo index was carried out. Then, the patient underwent a detailed clinical examination by the investigator as per the Helkimo's clinical dysfunction index.

Statistical Analysis

Data were entered in Microsoft Excel Sheet, software of Microsoft Corporation, Redmond, Washington. USA and analysed using Statistical Package for Social Sciences (SPSS) 17.0 for Windows, a statistical software of IBM (New York, USA). The data were presented as percentages for continuous variables (such as age and Helkimo clinical dysfunction index, mechanism of injury, associated soft‑tissue injuries and management of condylar fractures) as well as dichotomous variables (such as associated comorbidities, associated bony injuries and condylar dislocation). The degree of TMJ dysfunction for varying follow‑up periods was assessed using the Kaplan–Meier analysis. The test of significance used was Fisher's test, a non‑parametric test.

Results

Table 1: Demographic data

Age groups in years	N	%
18-30	12	60
31-50	6	30
>50	2	10
Gender		
Male	18	90
Female	2	10
Mode of injury		
RTA	18	90
Fall	1	5
Others	1	5
Condylar dislocation		
Yes	4	20
No	16	80
Condylar fracture		
Unilateral	16	80
Bilateral	4	20

Nearly 60% were in the age group of 18–30 years and 31–50 years accounted for another 30% of the patients. There were 90% male as compared to females. Road traffic accidents accounted for 90% and falls accounted for 5% of the cases. Around 80% had unilateral condylar fractures. Condylar dislocation was observed in 20% of patients.

Table 2: Surgical procedure

Surgical procedure	N	%
IMF and ORF	5	25
IMF only	15	75

25% patients underwent IMF only and 75% underwent IMF and ORIF surgery procedure.

Table 3: Helkimo's anamnestic dysfunction index and Helkimo clinical dysfunction index

Helkimo's anamnestic dysfunction index	N	%
No symptoms	9	45
Mild symptoms	6	30
Severe symptoms	5	25
Helkimo clinical dysfunction index		
No dysfunction	2	10
Mild dysfunction	12	60
Moderate dysfunction	6	30
Severe dysfunction	0	0

As per the Helkimo's anamnestic index, 45% had no symptoms, 30% had mild symptoms and 25% had severe symptoms. In the clinical Helkimo dysfunction index, there was no dysfunction in 10%, mild dysfunction in 60% and moderate dysfunction in 30% of cases. None had severe dysfunction.

Discussion

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. [10] 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. [11]

Nearly 60% were in the age group of 18–30 years and 31–50 years accounted for another 30% of the patients. There were 90% male as compared to females. Road traffic accidents accounted for 90% and falls accounted for 5% of the cases. Around 80% had unilateral condylar fractures. Condylar dislocation was observed in 20% of patients. 25% patients underwent IMF only and 75% underwent IMF and ORIF surgery procedure. As per the Helkimo's anamnestic index, 45% had no symptoms, 30% had mild symptoms and 25% had severe symptoms. In the clinical Helkimo dysfunction index, there was no dysfunction in 10%, mild dysfunction in 60% and moderate dysfunction in 30% of cases. None had severe dysfunction. The Helkimo anamnestic index is based on the patients' symptoms; a majority of our patients were asymptomatic. A study by Köhler et al [12] showed similar results, but Leuin et al [13] 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 [14] and Borgiel-Marek et al. [15]

Kyzas et al [16] 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.

Conclusion

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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