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Quality of Life after Open versus Closed Treatment for Mandibular Condylar Fractures

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ABSTRACT

Objective: To compare the quality of life after surgical management with closed reduction and internal fixation (CRIF) versus open reduction and internal fixation (ORIF) for mandibular condylar fractures. **Methodology:** This analytical observational study was carried out between January 2024 to June 2024, at the Department of Oral and Maxillofacial Surgery, Jinnah Postgraduate Medical Centre, Karachi, focusing on patients with mandibular condylar fractures. The study assessed their quality of life using the General Oral Health Assessment Index (GOHAI) Questionnaire, with scores ranging from 1 to 3, where 1 denoted "Always," 2 indicated "Sometimes," and 3 represented "Never." Quality of life scores were categorized as high (34-36), medium (31-33), or low (<30) based on the GOHAI results. **Results:** In this study there were 66.7% neglected patients had high quality of life, 15.4% had moderate, and 27.3% had low GOHAI, (p=0.084). Further, there were only 16.7% patient close reduction management had high quality of life, 5 (38.5%) had moderate, and 545.5% had low GOHAI. According to open reduction management, there were 83.3% patients had high quality of life, 61.5% had moderate, and 45.5% had low GOHAI, (p=0.157). **Conclusion:** Factors such as age, gender, neglected type, and treatment modality did not significantly affect the post-operative quality of life. However, mandibular fracture patients who underwent surgical treatment with open reduction technique, as assessed by the GOHAI parameter, experienced a high quality of life..

INTRODUCTION

Mandibular fractures are common, accounting for 76% [1] of all maxillofacial fractures due to the mandible's exposed position and anatomical characteristics; these fractures most frequently involve the mandibular condyles accounts for 56.5% followed by mandibular symphysis 45.0%, mandibular body 25.5%, and mandibular angle 16.5%[2]. Therapeutic approaches for these fractures typically fall into two categories: closed reduction and open reduction[3].

When deciding between ORIF versus closed reduction and mandibulomaxillary fixation (MMF) for fractures of the condylar process of the mandible[4], it's important to consider that while open surgical management has long been favored for fractures of the mandible body and midface due to easier access and better repositioning[5], moderately displaced condylar fractures often still lean towards closed reduction with MMF due to the challenging access to the area of condyle and the complexities involved in repositioning the proximal fragment[6].

In recent decades, there has been a growing emphasis on quality of life (QOL) considerations in healthcare, particularly regarding patients' awareness of treatment options and their social and

physical impact on daily life, facilitated by widespread access to information through the Internet, television, and newspapers[7]. As part of assessing QOL related to oral health, one commonly used instrument is the Oral Health Impact Profile (OHIP-14), which measures various parameters to evaluate the impact of oral health conditions on individuals' quality of life[8]. The Oral Health-Related Quality of Life (OHRQoL) assessment includes seven dimensions, each represented by two items, resulting in 14 questions known as OHIP-14[9]. Dimensions of this tool cover different modes of quality of life as D1 represents the functional limitations, D2 for pain perception, D3 for psychological discomfort, D4 for physical activity, D5 for psychology related disabilities, social disabilities represented with D6 and D7 for handicaps[10]. Another widely used instrument for assessing oral health-related quality of life is the GOHAI[11].

This study aims to assess the postoperative quality of life among patients who have undergone surgery for mandibular fractures, utilizing the GOHAI measurement instrument as a means of quantifying patient satisfaction and well-being. The focus on understands how this specific surgical intervention impacts various aspects of patients' daily lives, including functional limitations, psychological factors, and overall oral health-related quality of life.

METHODOLOGY

The Analytical Observational Study was conducted between January 2024 to June 2024, at the Department of Oral and Maxillofacial Surgery, Jinnah Postgraduate Medical Centre, Karachi. Patients aged 18 to 65 years with mandibular condylar fractures were enrolled and maltreated or malunited fractures were examined clinically and radiographically. Facial trauma patients were also examined clinically and radiographically. Patients unwilling to participate were excluded. Participation required informed written consent, with patients briefed on study objectives, assured of confidentiality and informed of the study's risk-free nature.

Mandibular condylar fractures are characterized by a bone discontinuity above the mandibular foramen, extending from the posterior border of the ramus to the sigmoid notch or condylar head. Clinically, they present as step defects and are visible on radiographs. The GOHAI Questionnaire, which uses a scoring system of 1 to 3 (1=Always, 2=Sometimes, 3=Never), was employed to assess the quality of life. A high-quality life score was defined as 34-36, medium quality as 31-33, and low quality as less than 30. Following a 60-day procedure, patients recorded their quality of life levels using the GOHAI Questionnaire. Sample size determined using the WHO sample size calculator in OpenEpi. The calculation factored in the frequency of low and moderate quality of life in the open reduction group at 50% and 42.9% in the closed reduction group, with a test power of 80% and a confidence interval of 95%.

A comprehensive history and examination were conducted, confirming mandibular condylar fractures in patients based on clinical and radiographic assessments. Baseline data including age, gender, residential status, and the cause of the fracture (e.g., RTA, fall, assault, or other reasons) were documented. A total of 30 patients were included in the study, with 15 undergoing open reduction and 15 undergoing closed reduction for mandibular condylar fractures. Parameters such as Visual Analog Scale (VAS) Score for pain, mouth opening measured in millimeters (mm), and the level of quality of life assessed using the GOHAI Questionnaire were recorded for each patient. Data from patients were entered into SPSS version 27 for analysis. A p-value of 0.05 or less was considered statistically significant.

RESULTS

In this study, General Oral Health Assessment Index was low in 11 (36.7%) patients, moderate in 13 (43.3%) patients, and High Quality of life in 6 (20.0%) patients. (Figure. I). The patients who had High Quality of life GOHAI was younger than the low, and moderate GOHAI, but this difference was insignificant, (p=0.086). There were 5 (83.3%) males had high quality of life, 11 (84.6%) males had moderate, and 9 (81.8%) males had low GOHAI. According to females, there were 1 (16.7%) female had high quality of life, 2 (15.4%) had moderate, and 2 (18.2%) had low GOHAI, (p=0.983). There were 4 (66.7%) neglected patients had high quality of life, 2 (15.4%) had moderate, and 3 (27.3%) had low GOHAI,

(p=0.084). Further, there were only 1 (16.7%) patient close reduction management had high quality of life, 5 (38.5%) had moderate, and 5 (45.5%) had low GOHAI. According to open reduction management, there were 5 (83.3%) patients had high quality of life, 8 (61.5%) had moderate, and 6 (45.5%) had low GOHAI, (p=0.157). (Table. I).

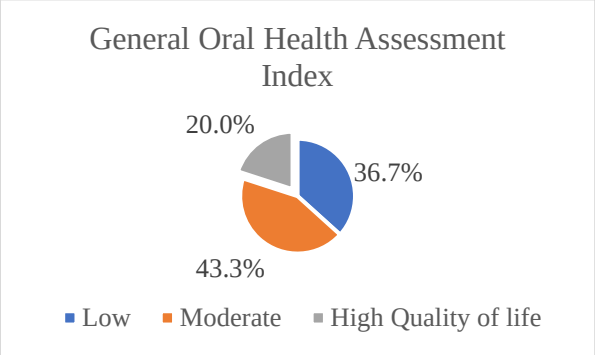
Table 1

Distribution of General Oral Health Assessment Index with demographic profile, neglected type and obtained management

Variable	General Oral Health Assessment Index			p-value
	Low	Moderate	High Quality of life	
Age (years)	40.73±14.36	40.31±8.98	28.67±8.38	0.086
18-40	5 (45.5)	7 (53.8)	5 (83.3)	0.280
41-65	6 (54.5)	6 (46.2)	1 (16.7)	
Sex				
Male	9 (81.8)	11 (84.6)	5 (83.3)	0.983
Female	2 (18.2)	2 (15.4)	1 (16.7)	
Type of neglected				
Neglected	3 (27.3)	2 (15.4)	4 (66.7)	0.084
Not neglected	8 (72.7)	11 (84.6)	2 (33.3)	
Obtained management				
Close reduction	5 (45.5)	5 (38.5)	1 (16.7)	0.492
Open reduction	6 (54.5)	8 (61.5)	5 (83.3)	

N (%), mean ± standard deviation

Figure 1



DISCUSSION

The study revealed that the majority of patients with mandibular fractures were young adults between the ages of 18 and 40. This was because of higher level of activity and productivity typically associated with individuals in this age group, leading to an increased risk of trauma compared to those aged 40 to 65 years. Amran et al[9] study, in line with similar research, revealed that among various age groups, young adults (age 41-65 years) exhibit the highest incidence of mandibular fractures. This finding underscores the vulnerability of this demographic to such injuries, potentially due to factors like lifestyle, activities, and risk-taking behaviors that may expose them to situations leading to mandibular trauma.

This study was conducted on condylar fractures of the mandible due to the anatomical vulnerability of the condyle region, which experiences the highest pressure during collisions in the anterior area of the mandible. Natuet al[12] conducted a study on 102 cases of mandibular fracture, revealing that 29.1% of the fractures were in the condyle, 24.5% in the angle, and 22% in the symphysis and parasymphysis.

In this study, an equal number of patients underwent open reduction and closed reduction procedures, despite previous literature suggesting a dominance of condylar fractures requiring open reduction in mandibular fractures. The general approach is to surgically treat displaced mandibular fractures and opted for conservative management for nondisplaced ones[13].

In their study, Asimet al[14] highlighted that ORIF is the preferred surgical method for managing displaced mandibular fractures.

In this study, General Oral Health Assessment Index was low in 36.7% patients, moderate in 43.3% patients, and high in 20.0% patients. In Omejeet al[15] study involving 56 cases of mandibular fractures, patients undergoing open reduction treatment reported a decrease in quality of life primarily attributed to post-surgery pain, whereas those treated with closed reduction exhibited a decline in quality of life associated with both physical and psychosocial discomfort.

Dorval et al[16] found a significant difference at 8 weeks postoperatively between healthy individuals and patients treated for mandibular fractures using ORIF or MMF techniques, with posttraumatic stress and accompanying emotional and psychological depression potentially contributing to the variance in Quality of Life outcomes.

A study conducted by Nasiret al[17] found that open therapy resulted in a significantly greater improvement in quality of life compared to closed treatments, with these differences being statistically significant.

A retrospective cohort study was conducted on patients of mandibular condylar fracture treated with ORIF and closed reduction with intermaxillary fixation (CRIMF). Who were reported pain score (4.5 versus 6.3) after 2 weeks of treatment and functional outcomes as physical activity score (5.0 versus 6.3) at 2 months were significantly different between ORIF and CRIMF groups (p=0.04 and p=0.01)[18].

In their study, Somoyeet al[19] found that patients who received closed reduction or ORIF showed no difference in overall quality of life at Time 3. Conversely, Hull et al[20] reported that ORIF restricted interfragmentary mobility during function, whereas closed reduction hindered masticatory function of the mandible and interfragmentary mobility.

CONCLUSION

Factors such as age, gender, neglected type, and treatment modality did not significantly affect the post-operative quality of life. However, mandibular fracture patients who underwent surgical treatment with open reduction technique, as assessed by the GOHAI parameter, experienced a high quality of life.

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