

A Comparison of Quality of life in Patients of Mandibular Condyles Fractures Treated with Open Versus Close Reduction

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ABSTRACT

Aim: The notion of quality of life pertains to the subjective assessment made by people on their overall well-being, taking into account their cultural and value orientations, as well as their goals, expectations, standards, and concerns. The notion of quality of life (QoL) within the medical field is often denoted as Health-Related Quality of Life (HR-QoL) or subjective health status. The primary objective of research on quality of life (QoL) is to evaluate the influence of sickness, disease, and their corresponding therapies on the holistic welfare of individuals.

Objectives: The objectives of the study are to compare quality of life in patients of mandibular condylar fractures treated with open versus close reduction.

Method: A total of 84 individuals diagnosed with subcondylar fractures of the mandible were subjected to evaluation. All fractures seen in the study exhibited displacement, either in the form of angulation ranging from 10° to 35° or a shortening of the ascending ramus by more than 2 mm. A comprehensive assessment, including both clinical and radiographic examination, was conducted at the 6-month mark after the occurrence of the trauma. The clinical characteristics assessed in this study included oral pain, difficulty in chewing, discomfort, cosmetic deformity, impact on daily routine, and symptoms of sadness.

Results: The findings of the study indicate a statistically significant difference between the two groups, with a p-value of less than 0.05. The findings suggest that open reduction had superior outcomes compared to closed reduction in terms of alleviating oral pain, enhancing chewing ability, reducing discomfort, addressing cosmetic deformities, minimising disruptions to daily activities, and mitigating depressive symptoms.

Conclusion: The study has determined that open therapy yields a better improvement in quality of life compared to closed treatments, and these differences are statistically significant.

Keyword: Mandibular condylar fracture, open reduction, closed reduction, Quality of life

INTRODUCTION

A mandibular fracture may be defined as a disturbance in the structural integrity of any portion of the jaw resulting from traumatic events¹. Mandibular fractures have a widespread geographical distribution and account for roughly 36-59% of all maxillofacial fractures². Fractures often occur as a result of road traffic accidents, physical assaults, falls, projectiles, sports-related occurrences, and sometimes, from pre-existing pathologies³. The primary objective of mandibular fracture therapy is to achieve the restoration of both the anatomical integrity and functional capacities of the mandible. The standard procedure includes the reduction, immobilisation, and fixation of the broken mandible². Reduction is the medical procedure involving the realignment of fractured parts to their original anatomical configurations³. The method of immobilisation entails restricting mobility at the temporomandibular joints in order to facilitate the healing process. Fixation, conversely, involves maintaining the fracture parts in their reduced location to avoid movement throughout the healing process¹. The categorization of reduction strategies in the treatment of mandibular fractures is determined by the presence or absence of direct visual access to the site of the fracture, hence differentiating between open and closed approaches⁵. Closed reduction is a method that allows for the manipulation of fracture segments by the use of dental occlusion, without requiring direct visual access⁶. Open reduction is a surgical procedure that allows for direct visualisation of the fracture site by creating an incision. Various types of splints, such as bonded orthodontic brackets, arch bars, direct wires, or eyelet wires, may be used to carry out closed reduction and maxillomandibular fixation procedures. Open reduction is a surgical intervention involving the use of wires, plates, and other stiff instruments directly at the site of a fracture⁷. The notion of quality of life refers to the subjective assessment made by people of their position within society, including cultural and value systems, as well as their goals, expectations, standards, and concerns⁸. In the field of medicine, the concept of Quality of Life (QoL) is sometimes denoted as Health-Related Quality of Life

(HR-QoL) or subjective health status. The primary objective of quality of life (QoL) research is to evaluate the influence of sickness, disease, and their corresponding therapies on the holistic welfare of patients⁹. The evaluation of Health-Related Quality of Life (HR-QoL) has become more relevant in the field of healthcare, specifically in the context of maxillofacial surgery¹⁰. The entire quality of life for patients who have had face procedures is often negatively affected by the possibility of facial deformity, leading to decreased postoperative well-being¹¹. Similarly, crucial physiological functions such as the generation of speech, the act of swallowing, or the process of chewing may encounter deterioration¹². The correlation between a degraded quality of life and worse survival rates highlights the need of offering support to those who are facing a decline in their overall well-being¹³. The evaluation of postoperative quality of life is of considerable significance. Insufficient scholarly literature exists pertaining to the assessment of quality of life in Pakistan. The objective of this research is to evaluate the overall well-being and contribute to the enhancement of mental well-being.

METHODOLOGY

Prospective research was done on a cohort of 84 patients with mandibular condylar fracture, aged between 18 and 55 years, who presented to the Nishtar Institute of Dentistry in Multan. The study period spanned from September 2021 to February 2023. The study had a cohort of 84 patients who were allocated into two equal-sized groups, namely group A and group B. Group A consisted of patients who underwent open reduction with internal fixation, whereas group B comprised patients who received closed reduction with maxillomandibular fixation. The research excluded individuals who were below the age of 18 years, patients with systemic disorders, patients with osteoporosis and osteopetrosis, and patients undergoing chemotherapy or radiation. A comprehensive account of the injury's characteristics and its associated symptoms was acquired. Furthermore, a comprehensive physical examination was conducted in order to

assess the patient's general state of health. Ethical approval was received from the institutional review board of the hospital. Furthermore, the individuals were duly informed and provided written permission about the process. Prior to the surgical procedure, all patients had preoperative and postoperative maxillofacial computed tomography (CT) scans in order to evaluate the degree of anatomical reduction achieved. The decision to undertake open or closed reduction was based on the severity of the damage. For example, instances involving sufficient mouth opening, regular occlusion, preserved vertical height of the ramus, comminuted condylar fractures, and displaced fractures inside the joint capsule were treated with closed reduction using MMF-arch bars or MMF with wire. Similarly, patients presenting with diminished mouth opening, malocclusion, or any occlusal irregularities, as well as those with a decreased vertical height of the ramus, significant displacement of fractured fragments, and concomitant injuries, underwent surgical treatment involving open reduction and internal fixation (ORIF) using mini plates and screws. In certain instances, maxillomandibular fixation (MMF) was employed following the ORIF procedure. Furthermore, a closed reduction procedure was performed to address the condylar fracture. Initially, an evaluation was conducted to determine if the

occlusion remained intact after closed reduction and sufficient mouth opening. Subsequently, the surgeon proceeded with the implementation of maxillomandibular fixation (MMF) for the treatment of the condylar fracture. Alternatively, in cases where closed reduction failed to establish stable occlusion and sufficient mouth opening, open reduction of the condylar/sub-condylar fracture was performed. The patients were released from the hospital within a period of three to five days after their surgical procedure. Nevertheless, they had regular follow-up assessments at six-month intervals. The data were captured and then subjected to analysis.

RESULT

Table 1: Gender Distributions of patients

Group		Frequency	Percent
Open Reduction	Male	29	69
	Female	13	31
Closed Reduction	Male	28	67
	Female	14	33

In current study 29 male and 13 female were included in group A while in group 28 male and 14 females were in group B.

Table 2: Between group comparison of mouth pain

Variable	Group	No		Mean & Std. Deviation	Mean Difference	P-Value
Mouth Pain	Open Reduction	42	Pre-treatment	8.43±1.172	5.62±0.346	.034
		42	Post-treatment	2.81±1.518		
	Closed Reduction	42	Pre-treatment	8.64±1.165	3.81±0.23	
		42	Post-treatment	4.83±1.395		

The pretreatment maximal level of oral discomfort in group 1 was measured to be 8.43, whereas in group B, it was found to be 8.64. Following the therapy, there was a notable enhancement in the level of oral discomfort, with group A experiencing a maximum mean of 2.81 and group B reporting a mean of 4.83. The findings indicated a statistically significant difference between the two groups, with a p-value less than 0.05. The findings suggest that the average difference in group A is greater than the average difference in group B, indicating that Open reduction is more effective than closed reduction in alleviating mouth discomfort.

Table 3: Between group comparison of chewing difficulty

Variable	Group	No of patient improved	
		Pre-Treatment	Post-Treatment
Chewing Difficulty	1	42	38
	2	42	13

Before the commencement of the surgical intervention, it was observed that all patients belonging to both experimental groups had challenges in the act of mastication. Following the completion of the surgical intervention, it was seen that a total of four patients from group 1 and 29 patients from group 2 had challenges related to mastication. Upon comparing the two groups, it was seen that the open reduction group (group A) had a more significant reduction in chewing difficulties in comparison to the closed reduction group (group B).

Table 4: Between group comparison of discomfort

Variable	Group	No of patient improved	
		Pre-Treatment	Post-Treatment Improved
Discomfort	1	42	37
	2	42	11

Prior to the surgical procedure, all patients in both groups experienced pain. Following the surgical procedure, a total of 5 patients in group 1 and 31 patients in group 2 had postoperative pain. When comparing the two groups, it was seen that the open reduction group (group A) saw a more substantial decrease in pain compared to the closed reduction group (group B).

Table 5: Between group comparison of aesthetic deformity

Variable	Group	N	Pre-Treatment Affected	Post-Treatment Improved
Aesthetic Deformity	Open reduction	42	42	36
	Closed reduction	42	42	21

In terms of malocclusion, it was observed that all patients in both groups had cosmetic deformity before to the surgical intervention. In group A (open reduction), a total of 8 patients had postoperative aesthetic deformity. In contrast, in group B (closed reduction), 21 patients had aesthetic deformity that persisted even after a six-month follow-up period, indicating an inability to repair the deformity.

Table 6: Between group comparison of Effect on daily routine

Variable	Group	N	Pre-Treatment affected	Post-Treatment Improved
Effect on daily routine	Open reduction	42	42	37
	Closed reduction	42	42	19

The occurrence of an effect on the daily routine is seen in all patients belonging to both groups. The postoperative daily routine showed improvement in 37 patients who had closed reduction, compared to 19 patients who underwent open reduction, up to the 6th month follow-up period.

Table 7: Between group comparison of Depression

Variable	Group	N	No of patient improved	
			Pre-Treatment Affected	Post-Treatment
Depression	Open reduction	42	42	29
	Closed reduction	42	42	8

Regarding the self-perception of scar development, it was observed that 13 patients in the open reduction group and 34 patients in the closed reduction group reported experiencing symptoms of depression throughout the 6-month follow-up period.

DISCUSSION

A continuous discourse exists within the field of maxillofacial surgery regarding the optimal approach to the treatment of condylar fractures¹⁴. The establishment of these criteria was informed by the prevailing techniques, materials, and scientific literature of the era in question¹⁵. The practise of rigid internal fixation has increasingly been applied to the traumatised craniomaxillofacial structure over time¹⁶. The development of improved materials for the purpose of stabilising and improving surgical techniques has resulted in a notable shift in the predominant mindset, whereby surgeons and patients now widely accept and rely on rigid internal fixation¹⁷. The current investigation has ascertained that the level of enhancement attained via open treatment exceeds that attained through closed methods, and this disparity holds statistical significance. The interconnection between individuals' perception, psychological predisposition, and personality types has been noted by the World Health Organisation (1996). The interplay of these factors exhibits dynamism and unpredictability, presenting difficulties in conducting individual assessments for each factor¹⁸.

CONCLUSION

The study findings indicate that open therapy yields a larger increase in quality of life compared to closed treatments, and these differences are statistically significant.

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