



# Quality of Life in Patients Undergoing Different Treatment Modalities for Condylar Fractures: A Comparative Study

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## KEYWORDS

Different Treatment Modalities

## ABSTRACT:

**Background:** Condylar fractures constitute a significant portion of mandibular fractures, ranging from 29% to 52% of all occurrences. These fractures can impair oral functions such as mastication, mouth opening, and occlusion, thereby diminishing a patient's quality of life. Management strategies encompass closed reduction, open reduction with internal fixation, and endoscopy-assisted ORIF.

**Aim:** This study aimed to compare the quality of life outcomes among patients treated with various modalities for condylar fractures.

**Methods:** A retrospective cohort study was conducted on 128 patients managed between 2022 and 2024. Participants were stratified into three treatment groups: ORIF, closed reduction, and endoscopy-assisted ORIF. Clinical parameters assessed included nerve injury, scarring, mouth opening, postoperative occlusion, duration of intermaxillary fixation, and masticatory performance.

**Results:** Statistically significant disparities were identified in scar formation, mouth opening, occlusion, IMF duration, and masticatory performance. However, no significant differences were observed in nerve injury rates across the groups. The EAORIF group exhibited superior cosmetic outcomes and a quicker recovery period compared to both ORIF and CR.

**Conclusion:** EAORIF offers advantages in reducing morbidity and scarring, while ORIF ensures stable anatomical reduction. Closed reduction remains a viable option for specific patient populations. Treatment planning should be individualized based on patient-specific factors and surgeon expertise.

## 1. Introduction

The mandible is the most frequently fractured bone in the facial structure, accounting for 64.4% of all maxillofacial fractures [1]. Condylar region involvement is noted in 29–52% of mandibular fractures [2]. These injuries are critical due to their potential impact on occlusion, mandibular symmetry, and temporomandibular joint function. Long-term sequelae such as malocclusion, chronic pain, and restricted jaw mobility can arise from condylar process fractures, underscoring the necessity for effective management [3].

The optimal management for condylar fractures remains a subject of ongoing discussion.

Closed reduction, while avoiding surgical risks, may lead to prolonged immobilization, limited mouth opening, and malocclusion [4]. Open reduction and internal fixation allows for direct visualization and rigid fixation, promoting earlier functional recovery but carries inherent risks, including visible scars, facial nerve injury, and other surgical complications. Endoscopy-assisted ORIF presents a minimally invasive alternative, combining precise surgical reduction with reduced



morbidity and enhanced aesthetics [5] [6]. The selection of a treatment modality is contingent upon fracture characteristics, patient-specific factors, and surgeon experience, with each approach possessing distinct functional and aesthetic implications [7].

This study aimed to evaluate the comparative effects of CR, ORIF, and EAORIF on patients' postoperative quality of life.

## 2. Materials and Methods

A retrospective cohort study was conducted at Saveetha Dental College, involving 128 patients treated between 2022 and 2024.

### Groups:

- ORIF: 90 patients
- CR: 26 patients
- EAORIF: 12 patients

### Data Collection:

Institutional dental archiving software was utilized for data extraction. In addition, patient demographics, fracture classification, and preoperative neurological assessments were meticulously gathered to ensure comprehensive data analysis.

### Treatment Modalities:

- CR: This method is achieved through intermaxillary fixation using arch bars, screws, or elastics.
- ORIF: This involves rigid internal fixation with plates and screws.
- EAORIF: This is an endoscopic-assisted fixation performed via minimally invasive incisions.

### Outcome Parameters:

1. Nerve injury
2. Scar formation
3. Mouth opening
4. Occlusion
5. IMF retention
6. Masticatory performance

**Statistical Analysis:** Chi-square tests were employed, with a significance level set at  $p < 0.05$ .

## 3. Results

The analysis revealed distinct postoperative outcome patterns across the three treatment groups. Significant differences were observed in scar formation, intermaxillary fixation duration, and masticatory performance. Conversely, no statistically significant variations were found in nerve injury or postoperative occlusion among the cohorts. This suggests that while functional and cosmetic aspects varied considerably, fundamental neurological integrity and occlusal relationships were largely preserved irrespective of the surgical approach. The findings indicate that the chosen treatment modality for condylar fractures significantly influences patient quality of life metrics, particularly those related to functional recovery and cosmetic outcomes, as reflected in variations in mouth opening and scar prominence.

**Nerve Injury:** No significant difference was noted among the groups.

**Scarring:** EAORIF yielded the least visible scarring.

**Mouth Opening:** Patients undergoing ORIF and EAORIF demonstrated improved mouth opening compared to those who received CR.

**Occlusion:** The ORIF group exhibited the most stable postoperative occlusion.

**IMF Retention:** Shorter IMF retention periods were required for the ORIF and EAORIF groups compared to the CR group.

**Masticatory Function:** EAORIF was associated with superior functional outcomes.

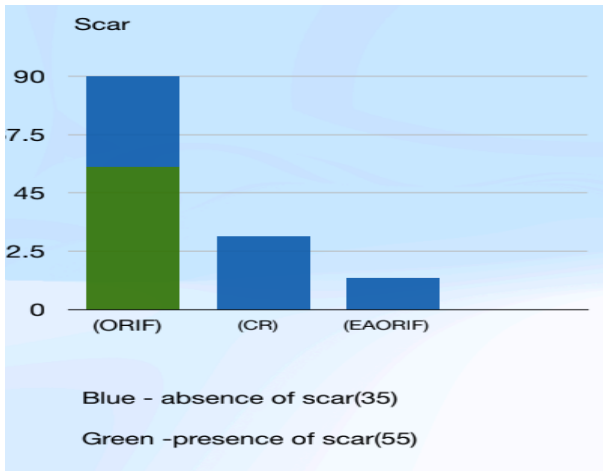


Figure 1: Scar Formation Across Treatment Modalities

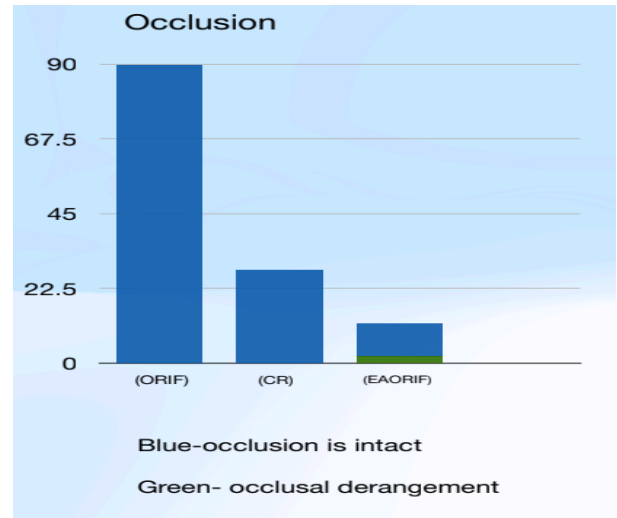


Figure 4: Postoperative Occlusion Stability

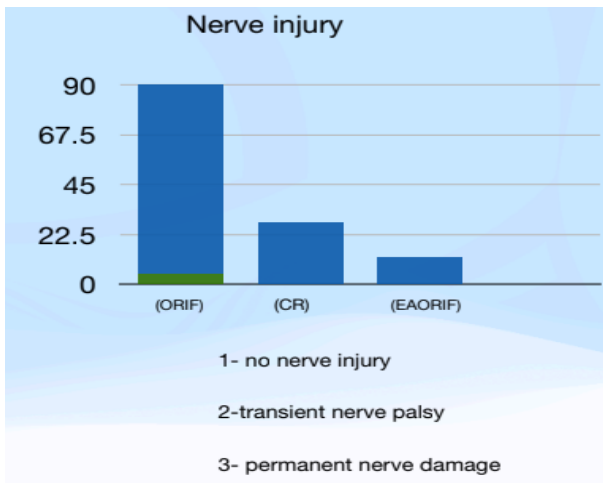


Figure 2: Nerve Injury Outcomes

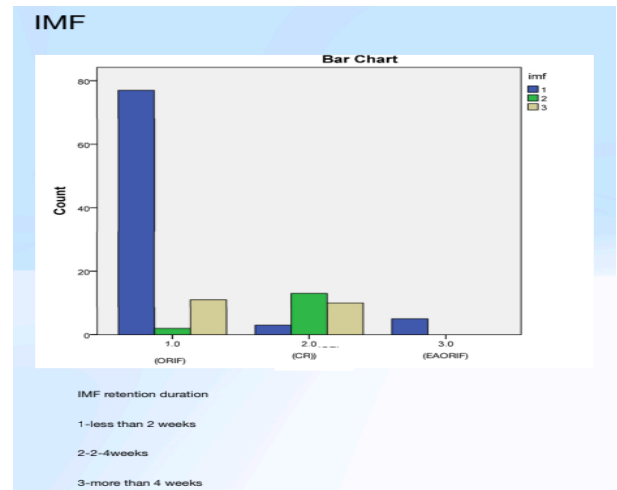


Figure 5: IMF Retention Duration

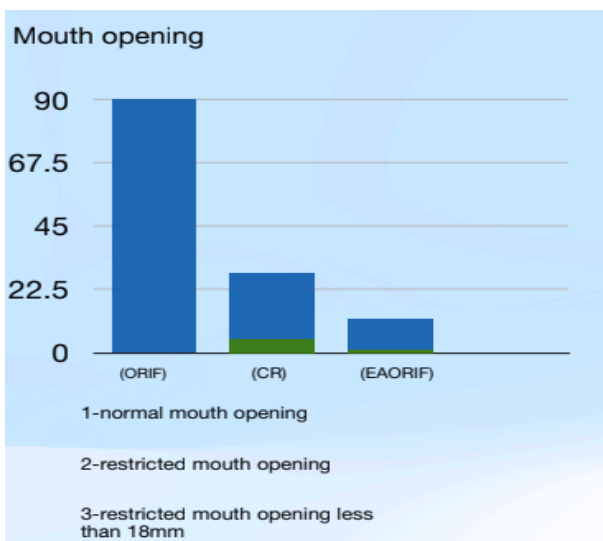


Figure 3: Mouth Opening Outcomes

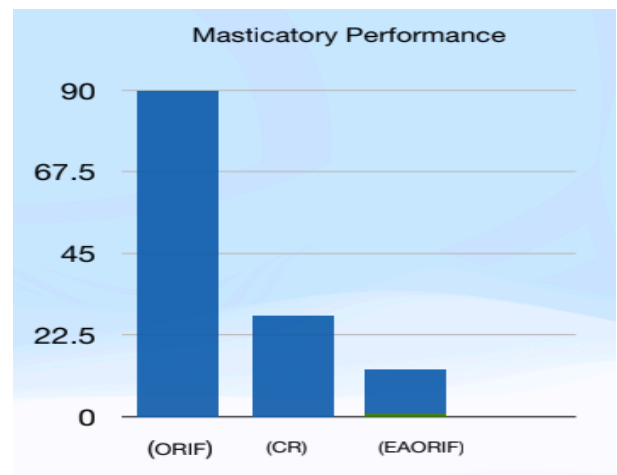


Figure 6: Masticatory Performance Across Modalities



## 4. Discussion

This study corroborates existing evidence suggesting that surgical interventions generally provide superior functional outcomes compared to closed reduction. Although closed reduction is minimally invasive, it can result in prolonged IMF, compromised occlusion, and delayed functional recovery. ORIF facilitates anatomical reduction and early functional restoration but carries risks such as scarring, nerve injury, and infection. In contrast, endoscopy-assisted ORIF mitigates some of these disadvantages by employing smaller incisions, thereby minimizing visible scarring and potentially reducing the incidence of facial nerve compromise while still achieving rigid fixation and early mobilization [8]. While non-surgical methods are a viable option for mandibular condylar fractures, concerns remain regarding the adequacy of bone fragment reduction and subsequent remodeling [9]. The efficacy of open reduction and internal fixation in restoring proper dental occlusion and stable temporomandibular joint movement is well-documented, despite potential drawbacks like scar visibility and temporary trismus [10] [11]. EAORIF addresses these issues by combining precise reduction with minimal scarring and reduced morbidity, supported by long-term studies demonstrating its safety and reproducibility. Meta-analyses confirm that surgical approaches enhance quality of life and functional recovery compared to conservative methods. The findings of this study align with the growing consensus that active surgical interventions, particularly ORIF and EAORIF, offer superior functional and aesthetic outcomes in managing condylar fractures relative to traditional closed reduction methods [10].

Specifically, closed reduction with intermaxillary fixation has historically been common for mandibular fractures but is linked to prolonged recovery of inter-incisal opening and may negatively impact quality of life due to functional limitations in eating and speaking [12] [13]. Conversely, open reduction and internal fixation typically yields better functional outcomes and earlier return to normal activities by providing stable fixation and allowing immediate mandibular mobilization [14]. Furthermore, the use of IMF in closed reduction can cause significant patient discomfort, difficulties with oral hygiene, and potential temporomandibular joint issues due to prolonged immobilization [15]. Innovations such as self-tapping screws and arch bars have been explored

to improve patient comfort and manageability during IMF [16]. Nevertheless, prolonged IMF in closed reduction remains a concern due to its potential adverse effects on bite force recovery and overall masticatory function [17].

Therefore, treatment planning must be individualized, considering fracture type, systemic health, and surgeon expertise.

## 5. Conclusion

EAORIF provides substantial esthetic and functional advantages with reduced morbidity, whereas ORIF ensures stable anatomical reduction. CR may be appropriate for patients with medical contraindications or non-displaced fractures. A patient-centered, evidence-based approach is paramount.

Future research should focus on long-term comparative studies evaluating the cost-effectiveness and patient-reported outcomes of these diverse modalities, particularly investigating the role of novel biomaterials and advanced imaging techniques in optimizing treatment strategies.

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