https://doi.org/ 10.33472/AFJBS.6.5.2024. 7748-7754

African Journal of Biological Sciences

ORIF versus Prosthetic Rehabilitation --The Treatment Dilemma in a Malunited Condylar Fracture with occlusal discrepancy

Authors – Dr. Charu Girotra[1], Dr. Aishwarya Nair[2], Dr. Varun Irani[3], Dr. Parag Jain[4]

[1]Professor, Department of Oral & Maxillofacial Surgery, D.Y. Patil University, School of Dentistry, Nerul Navi Mumbai- 400706, charugirotra@yahoo.com

[2]Associate Professor, Department of Oral & Maxillofacial Surgery, D.Y. Patil University, School of Dentistry, Nerul Navi Mumbai- 400706, draishwaryagopalnair@gmail.com

[3]Post Graduate Student (MDS), Department of Oral & Maxillofacial Surgery, D.Y. Patil University, School of Dentistry, Nerul Navi Mumbai- 400706, varunirani@hotmail.com

[4]Post Graduate Student (MDS), Department of Oral & Maxillofacial Surgery, D.Y. Patil University, School of Dentistry, Nerul Navi Mumbai- 400706 ,jparag15@gmail.com

Article History
Volume 6, Issue 5, 2024
Received: 22 May 2024
Accepted: 29 May 2024
doi: *10.33472/AFJBS.6.5.2024. 7748-7754*

Abstract

Aim – To evaluate the complications of Conservative management of Unilateral Mandibular condylar fractures leading to malunion & to weigh in the advantages of ORIF over Prosthetic Rehabilitation

Material Methods - A 37-year-old female presented with a malunited unilateral condylar fracture treated via closed reduction which resulted in significant reduction in mouth opening and difficulty in mastication due to deranged occlusion. Secondary treatment was done via surgical intervention using Reosteotomization of the malunited segment through the fracture line to attain anatomical reduction and Reestablishing vertical height of the ramus.

Postoperatively, the patient was placed on a guided rehabilitation program to optimize functional outcomes and further prosthetic rehabilitation is planned.

Conclusion -This case report highlights the importance of recognizing and addressing malunited fractures of the mandibular condyle. Timely intervention and appropriate surgical management can result in significant improvement in pain, functional range of motion, and aesthetic satisfaction for patients suffering from malunited condylar fractures. By sharing this case, we aim to contribute to the growing body of literature on the optimal management of mandibular condyle fractures and promote better outcomes and quality of life for affected
individuals.

Keywords – Malunion, Subcondylar Osteotomy, ORIF, Deranged Occlusion

Introduction

Fractures of the condylar region of the mandible are common facial injuries that can result in significant complications if not properly managed. When these fractures are left untreated or are misaligned during treatment, they often lead to malunion. Malunited fractures of the mandibular condyle can lead to limited mouth opening, pain, and difficulty in chewing, speaking, and overall jaw movement and thus results in functional impairment and aesthetic concerns for the patient

Despite the displacement of the condyle, adult patients exhibit a mandibular position that is relatively acceptable giving an illusion of a normal occlusion. In particular, condylar fractures accompanied by significant displacement or dislocation of the proximal fragment pose a high risk of functional complications if treated conservatively.

With the never-ending debate of Conservative v/s Surgical management of mandibular condylar fractures, there have been recent advancements such as the development of Endoscopic assisted Surgery, there remains a constant scope for improvement. These advances remain directed towards attaining ideal functional, form and aesthetics while trying to avoid all possibilities of complications.

Nonunion or malunion may manifest early just after the healing process is complete or may present as long-term complications following initial mandibular fracture repair. While some of these issues can be resolved without surgery, it still becomes necessary to effectively manage certain unfavorable outcomes through surgical intervention. When evaluating a patient's condition, it is crucial to consider the ultimate goal of therapy. The patient's complaints and concerns are typically multifaceted, requiring guidance from the practitioner. Additionally, the significance of various factors differs for each patient. While some patients may be content with normal pain-free jaw movement, others may consider even the slightest malocclusion to be problematic.

Therapeutic decision-making for fractures of the condylar process of the mandible, specifically between open reduction and internal fixation (ORIF) and closed reduction and mandibulomaxillary fixation (CRMMF), should be based on diagnostic criteria with prognostic value. There is no consensus on whether an open or closed approach should be used for treating these fractures. Generally, the complexity of the fracture determines the need for operative treatment, with more complex fractures often requiring surgery. However, the definition of fracture complexity can vary among practitioners. It has been suggested that the level of the fracture, deviation (angulation) of the fragments, and shortening of the ascending ramus are important factors in predicting therapeutic success.

The shortened fractured ramus frequently results in premature dental contact on the fractured side and an open bite on the opposite side. This imbalance can potentially alter the load distribution within the temporomandibular joints (TMJs), leading to remodeling of the TMJs in order to compensate for the imbalance in the masticatory system. Consequently, the load on the non-fractured condyle is anticipated to increase, while the load on the fractured condyle is expected to decrease.

Case Report

A 37-year-old female patient presented to Dr. D.Y. Patil University, School of Dentistry at Oral and Maxillofacial Surgery OPD with a chief complaint of difficulty in chewing. The patient gives an alleged history of facial injury caused by a road traffic accident. Two days after the incident, the patient visited a local healthcare institute where an Orthopantomogram revealed a right subcondylar fracture. Closed reduction was performed using Erich's arch bars under local anesthesia at the local hospital. The patient was then kept under maxillomandibular fixation for three weeks with the help of elastics, and was advised liquid diet. The arch bars were removed after 2 months.

The patient visited D.Y Patil Hospital one month after the removal of the arch bars. Clinical examination revealed chin deviation to the right side during mouth opening. TMJ movements were non-palpable on the right side, and tenderness was noted in the right preauricular region. There was restricted mouth opening of 24mm along with restricted Lateral extrusive movements, while protrusive movements were unrestricted. Intraoral examination revealed missing teeth with respect to 14,16,42,46,36. Mouth opening was adequate, and occlusion showed a mild posterior open bite on the left side with premature contact in relation to the right maxillary 2nd premolar.

A Computed Tomography scan revealed a malunited right subcondylar fracture, with the condylar segment appearing medially fused to the ramal segment with an apparent loss of ramal height. Due to the peculiar presentation of this case where there were multiple missing teeth, a full mouth rehabilitation program treatment could be opted in for, but due to the restricted mouth opening and lateral extrusive movements, and loss of ramal height, surgical intervention followed by a full mouth rehabilitation program was chosen. Open Reduction and Internal Fixation (ORIF) was planned under General anesthesia. The patient was intubated using nasoendotracheal route with a north pole. Patient was scrubbed, painted and draped in usual aseptic manner. MMF was carried out using IMF screws due to multiple missing teeth. A Hind's retromandibular trans-parotid approach was taken to expose the malunited fracture segment. The condylar segment was fused to the ramal segment. The osteotomy was carried out through the pre-existing fracture line. Both segments were mobilized and the reduction in ideal anatomical position was achieved. Fixation of the segments was done using a 3D Delta plate. MMF was released and passive occlusion confirmed the ramal height restoration. A postoperative Computed Tomography scan was performed to evaluate the reduction of the malunited fracture segment, which confirmed adequate reduction with restoration of ramal height. The patient was then followed up with postoperative functional physiotherapy and is planned for full mouth prosthetic rehabilitation.
The patient was kept on a 2 year follow up and an adequate mouth opening of 33mm has been achieved. The patient remains asymptomatic and happy with the treatment provided. The prosthetic rehabilitation program is currently in motion and had faced a delay due to irregular appointment schedule of the patient post partum.

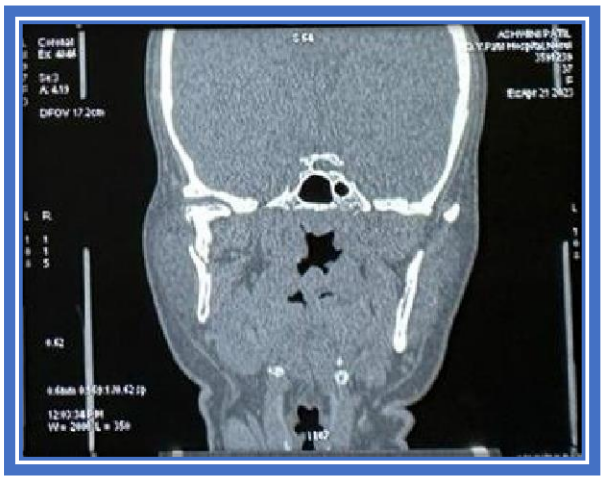


Figure.1 - Preoperative Coronal computed tomography (CT) image showing Right Subcondylar fracture. Note the loss of Ramal Height.

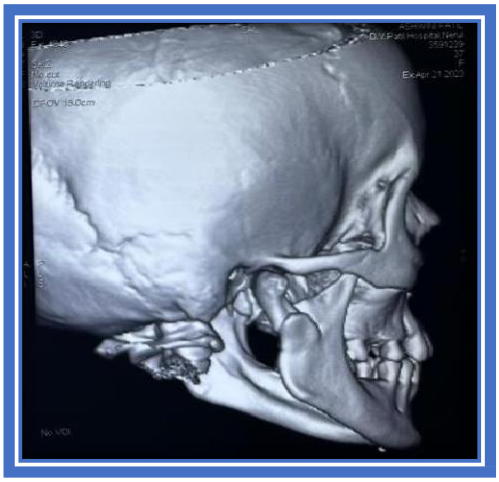
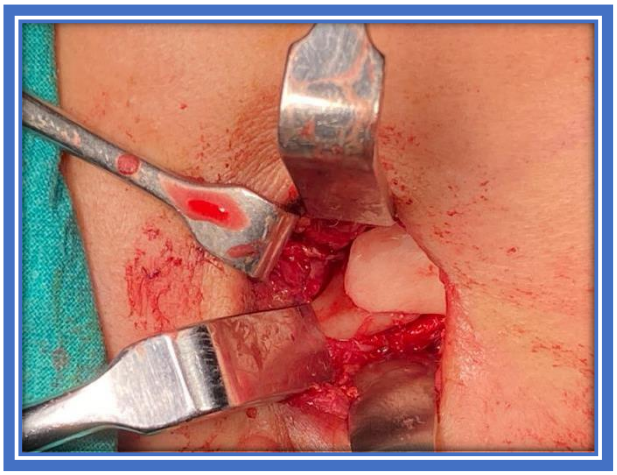


Figure.2 - Three-dimensional reconstruction clearly demonstrating Right condylar segment fused medially to the ramus

Figure.3 – Intraoperative Hind's retromandibular trans-parotid approach to expose the malunited segment



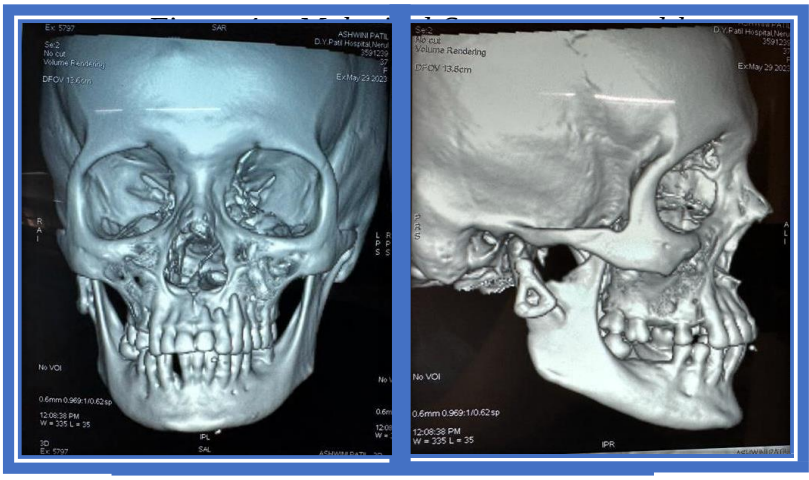


Figure.5 – Intraoperative Hind's

retromandibular trans-parotid approach to

expose the malunited segment

Figure.6 – Postoperative Computed Tomography reveals Fixation of the segments using Titanium 3D Delta Plate

Discussion

Condylar fractures of the mandible are relatively common, and when left untreated or managed inadequately, they can result in malunion and subsequent functional impairment and esthetic deformity. In this case report, we present a successful management strategy for secondary treatment of a malunited unilateral condylar fracture where we were posed with an option of using open reduction and internal fixation with miniplates and screws or opting in for prosthetic rehabilitation to address the occlusal discrepancies.

Malunion of condylar fractures can lead to several functional and aesthetic issues, including malocclusion, restricted mandibular movement, facial asymmetry, and pain. These complications can significantly impact the patient's quality of life and overall well-being. Therefore, timely intervention and appropriate management are crucial to improve patient outcomes.

Early intervention in malunited condylar fractures is crucial for achieving optimal outcomes. Timely diagnosis and appropriate surgical intervention can prevent the development of long-term functional impairment and esthetic deformity. There is also the associated effects seen on the Temporomandibular joint over a period of time. Steinhardt et al stated that there is the possibility of pain arising due to functional overload on the non-fractured TMJ as well. Early surgical intervention avoids this possibility of development of TMD as well thus making surgery a better option.

In this case, open reduction and internal fixation with miniplates and screws provided excellent results, allowing for the restoration of normal mandibular function and aesthetics. It provided the additional advantage of greater mouth opening, better lateral and protrusive mandibular movements and ideal placement of the condylar head into its anatomical position. This may pose as a better option than only prosthetic rehabilitation which may address the malocclusion, but does not provide the same level of mouth opening and range of mandibular movements.

It is important to note that each case of malunited unilateral condylar fracture is unique, and the treatment strategy should be tailored to the specific patient's condition. Factors such as the extent and location of the malunion, patient's age, general health, and functional goals need to be considered when planning the management approach.

There remains a lack of literature on unilateral condylar fractures in partially edentulous patients and the possibility of treatment using modes of prosthetic rehabilitation. With a chief complaint of malocclusion, prosthetic rehabilitation could be considered the primary treatment option in such cases. Due to the established benefits of opening the condyle, it remains prudent to reposition the condyle into its ideal anatomical position to attain ideal range of movements and function. Prosthetic rehabilitation can still be used as an adjunct therapy in such cases for further minor occlusal corrections and to restore ideal function.

The results of this case report were highly satisfactory. The patient reported significant improvement in mastication along with adequate mouth opening. The postoperative assessment

revealed satisfactory occlusion and mandibular range of motion. Follow-up imaging demonstrated stability and proper alignment of the fracture site. The patient was planned for prosthetic rehabilitation for final occlusal corrections.

In conclusion, open reduction and internal fixation with miniplates and screws represent a successful treatment approach for malunited unilateral condylar fractures. This technique offers precise anatomical reduction, stable fixation, and the restoration of mandibular function and aesthetics. Early intervention in malunited condylar fractures can lead to improved functional outcomes and patient satisfaction. However, further studies with larger sample sizes and long-term follow-up are needed to validate these findings and assess the long-term stability and effectiveness of this treatment approach.

This multifaceted approach of surgical intervention followed by full mouth prosthetic rehabilitation with a surgery first option has helped us rehabilitate our patient in form, function and aesthetics giving a near ideal result and is something that should be considered regularly especially for such patients with unilateral condylar fractures with a partially edentulous occlusion.

References:

1. A K, HL S, Management of Non-union and Malunion After Primary Mandibular Condyle Fracture Treatment: A Review and Recommendations, Journal of Oral and Maxillofacial Surgery (2020)
2. Al-moraissi EA, Ellis E, Surgical Treatment of Adult Mandibular Condylar Fractures Provides Better Outcomes than Closed Treatment: A Systematic Review And Meta-Analysis, Journal of Oral and Maxillofacial Surgery (2014)
3. The Impact of Treatment Delay on Malunion and Nonunion After Open Reduction of Mandible Fractures
4. Secondary Treatment of Malocclusion/ Malunion Secondary to Condylar Fractures Glenn Maron DDS , Amy Kuhmichel DMD , Geoffrey Schreiber DDS
5. Post-Traumatic Deformity Of Mandibular Condyle: Descriptive Review And Proposal Of Treatment Algorithm - Kumar Nilesh1 , Aaditee V. Vand
6. B. C. Rubens, P. J. W Stoelinga, T. J. Weaver and P. A. Blijdorp: Management Of malunited mandibular condylar fractures. Int. J. Oral MaxiIlofae. Surg. 1990; 19: 22-25.
7. Does Three-Dimensional Plate Offer Better Outcome and Reduce the Surgical Time Following Open Reduction and Internal Fixation of Adult Mandibular Unilateral Subcondylar Fractures. A Randomized Clinical Study Cynthia Scott, MDS,* Karthik Ramakrishnan, MDS,y Narayanan Vivek, MDS,z Chandran Saravanan, BDS,x and Gurram Prashanthi, MDSk
8. Open Reduction and Internal Fixation Versus Closed Treatment and Mandibulomaxillary Fixation of Fractures of the Mandibular Condylar Process: A Randomized, Prospective, Multicenter Study With Special Evaluation of Fracture Level Matthias Schneider, MD, DMD,* Francois Erasmus, MD,† Klaus Louis Gerlach, MD, DMD, PhD,‡ Eberhard Kuhlisch,§ Richard A. Loukota, FDSRCS, FRCS,¶ Michael Rasse, MD, PhD,# Johannes Schubert, MD, DMD, PhD, Hendrik Terheyden, MD, DMD, PhD,** and Uwe Eckelt, MD, DMD, PhD

9. Surgical management of mandibular malposition after malunited condylar fractures in adults- Journal of Cranio-Maxillofacial Surgery (1997) 25, 91 96 © 1997 European Association for Cranio-Maxillofacial Surgery