Journal of Surgery and Trauma 2024; 12(3):85-87.
jsurgery.bums.ac.ir

LETTER To EDITOR

Maxillofacial Patient Rehabilitation: How Can We Increase Maximum Interincisal Opening in Patients by Surgical Intervention?

Somayyeh Ebrahimgol[1], Mehrdad Shahraki[1], Sadra Amirpour Haradasht[1]✉

[1] *Department of Oral and Maxillofacial Surgery, School of Dentistry, Zahedan University of Medical Sciences, Zahedan, Iran*

Received: November 14, 2024 ***Revised: November 26, 2024*** ***Accepted: November 30, 2024***

Dear Editor

Maximum Interincisal Opening (MIO) refers to the greatest distance between the upper and lower incisors when the mouth is opened fully. It is a measure of the range of motion in the temporomandibular joint (TMJ) and can provide insights into the function and health of the jaw. Following maxillofacial surgery, patients frequently experience restricted MIO for several reasons. Effective rehabilitation is essential for restoring both functional and esthetic outcomes. Normal MIO values generally range between 40 to 60 millimeters in adults. However, this can vary based on individual anatomy and age (1, 2). Conditions leading to decreased MIO include temporomandibular joint disorders, muscle disorders, dental issues, trauma, orthodontic issues, infections, and systemic conditions. If a decrease in MIO is observed, it is often advisable to seek evaluation from a dental or medical professional to determine the underlying cause and appropriate treatment (1, 3). This article discusses current strategies and advancements in the rehabilitation of MIO in patients who have undergone maxillofacial procedures.

Increasing MIO in patients with limited jaw function can be achieved through a multifaceted approach, with surgical intervention playing a pivotal role.

Surgical Intervention: Procedures such as coronoid processectomy or TMJ surgery may be required to address anatomical constraints.

Here are key surgical approaches used to achieve this goal:

1. Coronoid Processectomy:

Coronoid process resection is a surgical procedure that entails the removal of the coronoid process, a bony protuberance located on the mandible. This anatomical structure can impede optimal mouth opening when it becomes overgrown or assumes an abnormal position, thereby compromising jaw mobility (4).

Indications: This intervention is frequently employed in cases where coronoid hyperplasia or ankylosis restricts jaw movement, leading to reduced mandibular functionality. Specifically, coronoid process resection is indicated when the abnormal growth or positioning of the coronoid process hinders normal jaw movement, necessitating surgical correction (5).

Surgical Outcome: The removal of the coronoid process can yield a significant increase in MIO, thereby eliminating the mechanical obstruction and restoring optimal jaw mobility. By alleviating this anatomical constraint, coronoid process resection can effectively improve overall masticatory function and enhance the patient's quality of life (6).

@2024Journal of Surgery and Trauma
Tel: +985632381214
Fax: +985632440488
Po Bax 97175-379
Email: jsurgery@bums.ac.ir

✉Correspondence to:
Sadra Amirpour Haradasht, Department of Oral and Maxillofacial Surgery, School of Dentistry, Zahedan University of Medical Sciences, Zahedan, Iran;
Telephone Number: 09114704715
Email Address: sadraharadasht@gmail.com

[Downloaded from jsurgery.bums.ac.ir on 2026-11-23]

[DOI: 10.61186/jsurgtrauma.12.3.85]

2. Temporomandibular Joint (TMJ) Surgery:

A range of surgical procedures can be employed to address TMJ pathologies, including arthroscopy, arthroplasty, and joint replacement. These interventions are designed to correct underlying joint anomalies, such as ankylosis, fibrosis, or deformities, which can compromise TMJ function (7).

Indications: Surgical management is often warranted in cases of TMJ disorders that result in limited mouth opening or chronic pain. Specifically, these procedures are indicated when patients present with symptomatic TMJ dysfunction, including restricted jaw mobility, pain, or tenderness, which can significantly impact their quality of life.

Surgical Outcome: The successful implementation of TMJ surgery can yield a significant improvement in joint function, accompanied by a reduction in pain and an increase in MIO. By correcting the underlying joint pathology, these procedures can effectively restore normal TMJ function, alleviate pain, and enhance overall masticatory performance. The therapeutic benefits of TMJ surgery can thus have a profound impact on patients' oral health and quality of life (8, 9).

3. Le Fort Osteotomy:

Maxillary osteotomy is a surgical procedure that involves the repositioning of the maxilla to remediate occlusal discrepancies and improve jaw function. In specific cases, this procedure may be performed in conjunction with mandibular osteotomy to achieve a comprehensive treatment outcome (10).

Indications: This intervention is therapeutically recommended for patients presenting with significant skeletal discrepancies or jaw deformities that compromise MIO. The presence of such anomalies can lead to impaired jaw function, malocclusion, and diminished oral health-related quality of life.

Surgical Outcome: The successful execution of maxillary osteotomy can yield a substantial improvement in overall jaw function, accompanied by an increase in MIO. Realigning the maxilla and mandible can effectively restore a harmonious occlusal relationship, thereby enhancing masticatory performance, reducing morbidity, and improving overall oral health outcomes. The precise repositioning of the maxilla can thus have a profound impact on patients' functional and esthetic well-being (11).

4. Mandibular Osteotomy:

Mandibular osteotomy is a surgical technique that involves the deliberate sectioning and subsequent repositioning of the mandible to correct malocclusions and optimize jaw function. This procedure is typically performed to address significant discrepancies in the skeletal architecture of the jaw, thereby restoring normal occlusal relationships and improving overall masticatory function (12).

Indications: Mandibular osteotomy is often employed in conjunction with other surgical procedures, such as maxillary osteotomy or genioplasty, to comprehensively address severe jaw discrepancies that compromise oral function and aesthetics. The therapeutic utility of this technique lies in its ability to correct complex skeletal anomalies, including those associated with facial asymmetry, sleep apnea, and TMJ disorders.

Surgical Outcome: The successful execution of mandibular osteotomy can lead to significant improvements in jaw function, manifesting as enhanced occlusal alignment and increased MIO. Repositioning the mandible can effectively restore harmonious relationships between the maxilla and mandible, thereby optimizing masticatory performance, reducing morbidity, and enhancing overall oral health-related quality of life. The precise correction of skeletal discrepancies using mandibular osteotomy can thus have a profound impact on patients' functional and esthetic well-being (11, 13).

5. Fibrous Adhesion Release:

Surgical release of fibrous adhesions or scar tissue is a targeted intervention designed to liberate restricted jaw movement by eliminating pathologic tissue barriers. This procedure is specifically intended to address the debilitating consequences of previous surgical interventions or traumatic events, which can lead to the formation of restrictive scar tissue and compromised jaw function. Indications: This therapeutic approach is particularly well-suited for patients presenting with scar tissue-mediated impedance of jaw opening, resulting in reduced MIO. The presence of such restrictive scar tissue can significantly compromise oral function, masticatory performance, and overall quality of life (14).

Surgical Outcome: The successful execution of the surgical release of fibrous adhesions can yield a notable improvement in MIO by reducing the restrictive effects of scar tissue. By eliminating these pathologic barriers, this procedure can effectively restore or enhance jaw mobility, thereby improving oral function, reducing discomfort, and enhancing overall oral health-related quality of life. The precise release of fibrous adhesions can thus have a profound impact on patients' functional and esthetic well-being, enabling them to regain optimal

[Downloaded from jsurgery.bums.ac.ir on 2026-11-23]

[DOI: 10.61186/jsurgtrauma.12.3.85]

jaw function and oral health (15).

Considerations for Surgical Management of Maximum Interincisal Opening (MIO) Limitations Preoperative Assessment

Thorough evaluation of the underlying cause(s) of restricted MIO is paramount to determine the most appropriate surgical intervention. This may involve a detailed history, physical examination, and imaging studies.

Postoperative Care

A comprehensive rehabilitation plan, including physical therapy and regular follow-up appointments, is essential to optimize recovery and maintain improvements in MIO.

Multidisciplinary Approach

Collaboration among maxillofacial surgeons, orthodontists, and physical therapists is often necessary to achieve the best outcomes. Each surgical procedure has specific indications and expected outcomes, and the choice of intervention should be individualized based on the patient's specific needs and clinical presentation.

By carefully considering these factors, a comprehensive and tailored surgical approach can effectively address MIO limitations and improve jaw function and overall well-being (2, 11, 12).

Evidence suggests that a multidisciplinary approach yields the best outcomes. Surgical interventions can address structural limitations. The key to successful rehabilitation lies in individualized treatment plans tailored to the patient's specific condition and surgical history. By adopting a holistic and personalized rehabilitation strategy, significant improvements in oral function and patient quality of life can be achieved.

References

1. Kumar A, Dutta S, Singh J, Mehta R, Hooda A, Namdev R. Clinical measurement of maximal mouth opening in children: a pioneer method. J Clin Pediatr Dent. 2012;37(2):171-176.
2. Szentpétery A. Clinical utility of mandibular movement ranges. J Orofac Pain. 1993;7(2):163-8.
3. Treat limited jaw opening in patients. BDJ In Practice. 2022;35(9):48.
4. Costa YM, Porporatti AL, Stuginski-Barbosa J, Cassano DS, Bonjardim LR, Conti PCR. Coronoid process hyperplasia: an unusual cause of mandibular hypomobility. Braz Dent J. 2012;23:252-5.
5. Mulder CH, Kalaykova SI, Gortzak RAT. Coronoid process hyperplasia: a systematic review of the literature from 1995. Int J Oral Maxillofac Surg. 2012;41(12):1483-1489.
6. Kim S-M, Lee J-H, Kim H-J, Huh J-K. Mouth opening limitation caused by coronoid hyperplasia: a report of four cases. J Korean Assoc Oral Maxillofac Surg. 2014;40(6):301-307.
7. Young AL. Internal derangements of the temporomandibular joint: A review of the anatomy, diagnosis, and management. J Indian Prosthodont Soc. 2015;15(1):2-7.
8. Wright EF, North SL. Management and treatment of temporomandibular disorders: a clinical perspective. J Man Manip Ther. 2009;17(4):247-254.
9. Açikliği Ettma, Ve M, Ilişkisinin Tebi. Investigation Amount Of Maximum Mouth Opening And Association With Temporomandibular Joint Disorders In Turkish Adult Population.2013.
10. Janson M, Janson G, Sant'Ana E, Nakamura A, de Freitas MR. Segmental LeFort I osteotomy for treatment of a Class III malocclusion with temporomandibular disorder. J Appl Oral Sci. 2008;16(4):302-329.
11. Aragon SB, Van Sickles JE, Dolwick MF, Flanary CM. The effects of orthognathic surgery on mandibular range of motion. J Oral Maxillofac Surg. 1985;43(12):938-943.
12. Yazdani J, Ebrahimi H, Talesh KT, Khashabi E, Pourshahidi S, Tadbir AA. Comparing the Effect of 3 Orthognathic Surgical Methods on the Mandibular Range of Movement. Journal of Craniofacial Surgery. 2010;21(3):703-705.
13. Ueki K, Marukawa K, Hashiba Y, Nakagawa K, Degerliyurt K, Yamamoto E. Assessment of the Relationship Between the Recovery of Maximum Mandibular Opening and the Maxillomandibular Fixation Period After Orthognathic Surgery. J Oral Maxillofac Surg. 2008;66(3):486-491.
14. GC S. Clinical staging of oral submucous fibrosis: A review. International Journal of Oral-Medical Sciences. 2011;10(3):216-219.
15. Balverdi M, Ghasemi T, Amirpour Haradasht S. Oral Submucous Fibrosis: a Premalignant Condition in a 22-Year-Old Iranian Man. WJPS. 2023;12(3):100-105.

[Downloaded from jsurgery.bums.ac.ir on 2026-11-23]

[DOI: 10.61186/jsurgtrauma.12.3.85]