Fenerbahce University
Journal of Health Sciences
Volume 5, Issue 2, 292-302, 2025

Fenerbahce University
Journal of Health Sciences
Volume 5, Issue 2, 292-302, 2025

FBU-JOHS

Physiotherapy and Rehabilitation After Orthognathic Surgery

Ortognatik Cerrahi Sonrası Fizyoterapi ve Rehabilitasyon

Alpin DEĞİRMENCİ[1*], Özden ÖZKAL[2]

[1] Çanakkale Onsekiz Mart University, Faculty of Dentistry, Department of Oral and Maxillofacial Surgery, Çanakkale, Türkiye.
[2] Bursa Uludağ University, Faculty of Health Sciences, Department of Physiotherapy and Rehabilitation, Bursa, Türkiye.

Abstract

The objectives of orthognathic surgery encompass achieving facial symmetry, enhancing aesthetics, optimizing masticatory function and occlusion, and elevating the quality of life. Pain, edema, and limitation in maximal mouth opening are the most important complications that occur early after surgery. Physiotherapy and rehabilitation approaches are combined with medical treatment to manage these problems. In order to prevent complications of general anesthesia after surgery, it is important to mobilize the patient early and add breathing exercises to the physiotherapy and rehabilitation program. Electrotherapy modalities, manual lymph drainage, and kinesio-taping techniques are included in the treatment program for postoperative pain and edema management. Active joint range of motion and functional exercises can be added to the program after the first week. After the first month, the treatment program continues with passive joint range of motion and stretching exercises. Factors such as the type of surgery performed, the duration of surgery, and the length of stay in intensive care can affect the treatment plan and its success. The collaboration of oral, dental, and maxillofacial surgery and physiotherapy and rehabilitation disciplines positively affects postoperative success during treatment. After surgery, a personalized assessment is made, and a physiotherapy and rehabilitation program is created, accelerating individuals' return to daily life after surgery and increasing their quality of life.

Key Words: Physiotherapy, maxillofacial surgery, orthognathic surgery, rehabilitation

Özet

Ortognatik cerrahide tedavi hedefleri, yüz dengesini sağlamak, estetiği artırmak, çiğneme fonksiyonunu ve oklüzyonu iyileştirerek bireylerin yaşam kalitelerini artırmaktır. Ağrı, ödem ve maksimal ağız açmada kısıtlılık cerrahi sonrası erken dönemde ortaya çıkan en önemli komplikasyonlardandır. Bu problemlerin yönetiminde medikal tedavi ile birlikte fizyoterapi ve rehabilitasyon yaklaşımları uygulanmaktadır. Cerrahi sonrası genel anestezinin komplikasyonları önlemek için erken dönemde hastanın mobilize edilmesi ve solunum egzersizlerinin fizyoterapi ve rehabilitasyon programına eklenmesi önemlidir. Cerrahi sonrası ağrı ve ödem yönetiminde elektroterapi modaliteleri, manuel lenf drenajı ve kinezyo bantlama teknikleri tedavi programında yer almaktadır. İlk haftadan sonra aktif eklem hareket açıklığı egzersizler ve fonksiyonel egzersizler programa eklenebilir. Birinci aydan sonra ise pasif eklem hareket açıklığı ve germe egzersizleri ile tedavi programına devam edilir. Yapılan cerrahinin tipi, ameliyat süresi, yoğun bakımda kalış süresi gibi faktörler tedavi planını ve başarısını etkileyebilir. Tedavi sürecinde, ağız, diş ve çene cerrahisi ile fizyoterapi ve rehabilitasyon disiplinlerinin birlikte çalışması ameliyat sonrası başarıyı olumlu yönde etkiler. Cerrahi sonrası, kişiye özel değerlendirme yapılarak fizyoterapi ve rehabilitasyon programının oluşturulması cerrahi sonrası bireylerin günlük yaşama dönüş süreçlerini hızlandırarak yaşam kalitelerini artırmaktadır.

Anahtar Kelimeler: Fizyoterapi, maksillofasiyal cerrahi, ortognatik cerrahi, rehabilitasyon

*Corresponding author alpindegirmenci@comu.edu.tr

DOI: 10.56061/fbujohs.1646549

REVIEW

How to cite (atıf için): Değirmenci, A. & Özkal, Ö. (2025). Physiotherapy and rehabilitation after orthognathic surgery. Fenerbahce University Journal of Health Sciences, 5(2), 292-302. DOI:10.56061/fbujohs.1646549

Submission Date: 25.02.2025, Acceptance Date: 28.02.2025, Publication Date: 29.08.2025

1. Introduction

Post-surgical edema, pain, muscle atrophy, loss of oral functions, and decreased range of motion in the jaw joint may occur after orthognathic surgery (OGS). The primary purpose of rehabilitation after OGS is to reduce pain and edema, regain range of motion in the jaw joint, and improve oral functions to increase quality of life In addition, since these procedures are performed under general anesthesia (GA), regulating the patient's circulatory and respiratory functions with physiotherapy in the early period after GA can reduce post-operative problems related to hospitalization by allowing the patient to be discharged more quickly. Providing oral and general rehabilitation to the patient in the post-operative period can improve the quality of life in the early period after surgery. Physiotherapy and rehabilitation approaches are combined with medical treatment to treat these problems. It is important to determine the treatment goals of the individuals for oral and general rehabilitation after OGS and to create a personalized treatment plan.

2. Orthognathic Surgery (OGS)

OGS is a specific procedure to correct facial deformities and jaw-to-jaw relationship disorders. This surgery can significantly improve patients' appearance and occlusal function, positively affecting oral function, facial aesthetics, individuals' self-perception, and general well-being. Investigative studies reveal that individuals suffering from skeletal deformities confront a range of functional difficulties, which involve malocclusions, weakened bite force, limited jaw mobility, swallowing difficulties, qualitative speech challenges, irregular chewing behaviors, and issues related to temporomandibular function. (Indications for Orthognathic Surgery, 2025) OGS can be applied in the treatment of malocclusions, correction of jaw-face asymmetries, and to reduce airway problems such as sleep apnea that cannot be treated with other methods in the treatment of congenital deformities and post-traumatic jaw deformities, and treatment of some temporomandibular joint diseases. It is mainly applied to provide a close-to-ideal relationship between the jaws in cases where the correct relationship between the jaws cannot be achieved orthodontical tooth movements. After the jaw relationship is adjusted, the dental relationship is adjusted again with orthodontic treatment (Indications for Orthognathic Surgery, 2025; Larsen, 2017; Naran et al., 2018; Te Veldhuis et al., 2017). There are four fundamental stages in OGS: 1) presurgical orthodontics; 2) surgical intervention; 3) postsurgical management and orthodontics for treatment finalization; and 4) provision of long-term orthodontic retention. (Wolford et al., 2011a). Before the operation, virtual planning is performed to determine the final positions of the jaw relations, and 3D surgical guide splints are prepared to ensure this position is maintained during the procedure. Under GA, according to the previous treatment plan, the maxilla, mandible, and chin tip are reached with intraoral and extraoral incisions and Le fort I-II-III, genioplasty, sagittal split ramus, mandible body or

*Corresponding author alpindegirmenci@comu.edu.tr

DOI: 10.56061/fbujohs.1646549

ramus osteotomies and combinations of procedures according to the preoperative planning are used. The jaws, which are released from their previous positions, are brought to their new positions using guide plates, and the jaw-to-jaw relationship is fixed in this final position with rigid fixation methods so that it remains fixed in this position. The incisions are closed primarily, and the procedure is completed. (Larsen, 2017; Naran et al., 2018; Te Veldhuis et al., 2017)

OGS primarily targets the jaws and teeth, but due to the interconnected anatomy of the face and skull, it also affects many structures in the maxillofacial region. Changes in dentofacial structures after surgery cause changes in mastication, speech, respiratory, and swallowing functions. The change in position of the jaws after surgery causes changes in the soft tissues associated with the jaws and improvement in facial symmetry. Also, it causes swelling and changes in lip posture. Changes in soft tissue following OGS may not always follow skeletal changes. Contour irregularities may be present, and significant skeletal changes and stretching of the tissue sheath may cause a decrease in the shape and volume of the soft tissue. Changes in the maxilla and mandible position lead to changes in pharyngeal airway volume and nasal airflow. Intraoral incisions minimize and conceal scar tissue within the mouth, but tissue elasticity may decrease after tissue healing.

Postoperative swelling may impair lymphatic drainage in the head and neck region. Postoperative edema and swelling reach their maximum in 4-5 days and disappear within 1 month. Complete recovery may take 9-12 months.(Larsen, 2017; Naran et al., 2018; Wolford et al., 2011b) It is a critical factor for high treatment quality and predictable outcomes in OGS is to provide effective patient management in the postoperative time. (Wolford et al., 2011b)

The patient is hospitalized until their body functions return to normal, they become mobile independantly and can provide their care, then the patient is discharged and followed up as an outpatient. The patient's ability to continue their daily activities early on increases the patient's quality of life, reducing problems related to hospitalization and reducing the burden on the social security institution. (Bär et al., 2024)

An extensive range of complications may manifest following OGS, encompassing hemorrhage, infection, scarring, impaired bone healing, malunion of sagittal split osteotomy, dental or osseous relapse, neurological damage, neuropathic pain, adverse effects on nasal aesthetics, temporomandibular joint dysfunction, segmental bone necrosis, respiratory distress, trigeminocardiac reflex, pseudoaneurysm, dental trauma, venous thromboembolism, vision loss, and psychological repercussions. The injury to the nervous system primarily pertains to the infraorbital, incisive, mental, and inferior alveolar nerves. Significant injuries to sensory nerves may cause permanent numbness, paresthesia, and other symptoms. (Naran et al., 2018; Wolford et al., 2011b) Generally, OGS candidates patients are between the ages of 18-25. However, it is reported that the number of patients undergoing OGS, significantly those older than these age groups, are increasing.(Chohan et al., 2024; Larsen, 2017) Advanced patient age has also been identified as a risk factor for permanent paresthesias. (Naran et al., 2018)

Postoperative alterations in sensation are typically resolved within a period of days to a year, shaped by the particularities of the trauma involved. Surgical manipulation of the maxilla has the potential to injure

the infraorbital nerve. While transient numbness in facial regions is common, permanent injury remains rare. The maxillary superior alveolar nerves are compromised during maxillary osteotomies, leading to numbness in the associated dental and gingival tissues. Reinnervation may require 1 to 1.5 years. Procedures involving the mandible and Genioplasty have the potential to compromise the inferior alveolar and mental nerves, thereby leading to sensory impairments. The outcomes of sensory nerve function in OSG are influenced by the level of surgical expertise, the requirements for jaw repositioning, the extent of nerve damage, and individual patient characteristics. Meticulous surgical techniques are designed to minimize permanent injury, with any such injuries necessitating microsurgical intervention for rectification.(Wolford et al., 2011b).

3. Physiotherapy and Rehabilitation Practices After OGS

The most common complication after OGS, which is encountered at a rate of 60-70%, is a decrease in the maximal mandibular opening. In addition, muscle atrophy and denervation in the surgical area, scar tissue formation, and decreased strength and flexibility of the muscles around the incision may also occur. These complications that occur after surgery may cause temporomandibular joint disorder in individuals along with restriction of mouth opening. This negative effect on mouth movement leads to deterioration in oral functions. Edema and pain that occur in the early period after surgery are other important complications that affect the treatment process and the individual's quality of life. (De Meurechy et al., 2019; Teng et al., 2015a). It has been reported that physiotherapy applications such as specific motor exercises, lymphatic drainage and Transcutaneous Electrical Nerve Stimulation are beneficial for myofunctional and neurosensory rehabilitation in the early period after OGS (Cacho et al., 2022; de Oliveira et al., 2021a),commencing physiotherapy shortly after OGS leads to a notable enhancement in myoelectrical muscle activity and increased mandibular mobility.(Ko et al., 2015a; Teng et al., 2015b). The application of interventions like physiotherapy improves neurosensory and functional rehabilitation, particularly within the critical periods of the first 14 days and 6 weeks post-surgery. (Bär et al., 2024, p. 1255). Physiotherapy and rehabilitation applications are an important part of the treatment process for the completion of the functional recovery process after OGS and for managing complications that may occur in the early/late period. The main objectives of physiotherapy and rehabilitation applications after OGS are;

• Reducing edema and inflammation,

• Providing pain control,

• Increasing the range of motion of the jaw joint,

• Regaining the strength and endurance of the muscles in the surgical area,

• Regaining sensory innervation in the surgical area,

• Restoring oral functions (De Meurechy et al., 2019; Navarro-Fernández et al., 2023; Teng et al., 2015a; Yang et al., 2020).

*Corresponding author alpindegirmenci@comu.edu.tr

DOI: 10.56061/fbujohs.1646549

3.1. Exercise

3.1.1. Mobilization and Breathing Exercises

GA and prolonged bed rest after surgery may adversely affect the cardiovascular and pulmonary systems. Atelectasis and lung infections are the most important complications that may occur (Miskovic & Lumb, 2017). The rehabilitation program should include early mobilization and respiratory exercises to prevent atelectasis. Gradual mobilization can be started in intensive care patients who are cardiovascularly stable after extubation. Sitting outside the bed's edge, standing up, and walking 50-60 m with support and supervision in the intensive care unit can be added to the treatment program. Early mobilization helps lung ventilation. It also prevents orthostatic hypotension and accelerates the early transition to daily life. Inward conditions, it is important for the patient to walk at least 100 m in the corridor every hour to improve cardiovascular and respiratory system functions (Weber Jr et al., 2024; Zhang et al., 2019). Due to the pain after surgery, patients may have difficulty breathing deeply and develop a shallow breathing pattern (Joseph et al., 2022). Therefore, it is recommended that breathing exercises be included in the treatment program from the earliest stage. Teaching the patient diaphragmatic breathing exercises and thoracic expansion exercises is important. During diaphragmatic breathing exercises, one hand is placed on the chest, and the other on the abdomen, and the patient is asked to take a deep breath towards the abdomen. After five or six repetitions, the patient is rested with respiratory control. In thoracic expansion exercises, the hand is placed on the lung lobe, which will be operated on. The patient is asked to take a deep breath towards that lobe. After five or six repetitions, the patient is rested with respiratory control. In prolonged bed rest, the importance of working the basal lobes of the lung should be given. It is recommended that breathing exercises be performed five or six times every hour during the day (Goñi-Viguria et al., 2018).

3.1.2. Jaw Movement Exercises

The edema and pain in the first week after surgery restrict the individual's jaw movements. In the first week, it is recommended that patients fed with soft food and liquids use their jaw movements and mouth openings in a limited way that allows them to maintain their oral functions. Active jaw movements can be added to the program from the second week after surgery until the end of the first month. It is recommended to perform active maximal mouth opening, lateral excursion, protrusive and retrogressive movements in 10 repetitions and holding them for 5 seconds at the end. Active jaw exercises in the first month should be performed within the painless limit, and the range of motion should gradually increase. A soft diet should be applied during the first 4 months after surgery, during the completion of the first phase of bone healing. Even if rigid fixation is used, the bone interface is weak because the maxilla is naturally thin in section, unlike the mandible; only certain areas have sufficient bone thickness for fixation, and it is repositioned with surgery.To avert complications such as nonunion, malunion, and malocclusion that could prompt further surgical procedures, it is imperative to refrain from consuming hard foods in the early stages especially following maxillary osteotomies. Initiation of jaw exercises may take place 2 to 3 weeks subsequent to surgery, targeting incisal and excursive movements. Instruction

on the removal and substitution of vertical vector elastics is essential for enhancing jaw-opening exercises.

Jaw exercises should be performed 4 to 5 times 297ort , for 10 to 15 minutes per session. When maxillary osteotomies are performed, the opening should be done with finger pressure only 297ort he first 4 months after surgery. More pressure for opening exercises can mobilize and displace the maxilla. Exercises can be performed by placing the heel of one hand on the zygomatic arch and pushing the mandible toward the opposite side with the other hand to provide stability during excursive movements. If there is no problem in the maxillary region after 4 months, higher-force intraoral rehabilitation devices can be used. Most patients who undergo OGS regain standard incisor opening and excursive movements within 3 to 6 months, and patients who undergo jaw joint surgery within 6 to 12 months if their jaw joints are healthy. However, some reduction in excursive movements is expected before surgery (Wolford et al., 2011b). Functional and passive range of motion exercises can start from the fifth week. Manual stretching exercises to increase the range of motion performed by the patient/physiotherapist can be added to the program. In addition, isometric biting exercises can be included in the program to train the chewing muscles. Dosage control should be provided, considering the fatigue that isometric exercises will create in the muscle. (de Oliveira et al., 2021b; Teng et al., 2015a; Yang et al., 2020). In addition, post-surgical sensory loss may also occur in the facial area. In this case, treatment methods and sensory training to stimulate nerve recovery can also be added to the program (Phillips et al., 2007, 2010). For a period extending several weeks following the surgical procedure, patients are required to abstain from any forms of exercise or activities that may trigger perspiration, increase blood pressure, or elicit teeth clenching. Specifically, maxillary surgical interventions are prone to considerable hemorrhaging as a result of activities that elevate blood pressure. Engaging in activities that facilitate clenching, including weightlifting and rigorous physical exercise, can cause issues related to maxillary mobility, obstruct the healing of bone, lead to malocclusion, and impose undue strain on the temporomandibular joint. These activities should be avoided for 4 months. The patient should be advised that they can swim in a swimming pool without leaking water into their nose and sinuses as early as the second week after surgery but that they should wait at least 4 months for activities such as diving and scuba diving and that if any bone grafting was performed during surgery, they should wait at least 6 months (Wolford et al., 2011b). The exercises to be selected after OGS should be specific to the individual's clinical condition. The type of surgery performed, the duration of the surgery, and the complications that occur after surgery affect the success of the rehabilitation program. Although there is not enough evidence on when to start the rehabilitation program after surgery, there are clinical opinions that it would be beneficial to start the exercise program early, considering the patient's clinical condition (de Oliveira et al., 2021b; Navarro-Fernández et al., 2023; Teng et al., 2015a; Yang et al., 2020).

3.2. Electrotherapy Modalities

Postoperative pain management after OGS is important in gaining an early jaw joint range of motion, supporting functional recovery, and ensuring patient comfort. Effective pain management ensures patient comfort, reduces the length of hospital stay, and positively affects surgical outcomes. In addition

*Corresponding author alpindegirmenci@comu.edu.tr

DOI: 10.56061/fbujohs.1646549

to pharmacological agents, different treatment methods are used in postoperative pain management (Joachim & Miloro, 2025; Navarro-Fernández et al., 2023). In addition to pharmacological treatment after surgery, low-intensity laser therapy (LLLT), ultrasound, cryotherapy (cold agents), and transcutaneous electrical nerve stimulation (TENS) applications can be used. LLLT can be included in the treatment program with its anti-inflammatory and analgesic effects mechanisms. Low-intensity ultrasound application reduces pain and accelerates the area's blood flow and healing process. TENS application is an electrotherapy agent that can be preferred after surgery to reduce pain with its gate control mechanism (Ko et al., 2015b; Navarro-Fernández et al., 2023; Yang et al., 2020). Cryotherapy and hilotherapy are among the treatment methods recently used to reduce pain and edema after OGS. Hilotherapy represents an alternative to cryotherapy that employs masks to maintain uniform facial temperatures. In contrast to traditional ice packs, it facilitates accurate modulation of cold exposure. Evidence supports the assertion that maintaining skin temperatures in the range of 10 to 15 °C contributes to enhanced comfort and compliance in cryotherapy. Hilotherapy is more effective in pain control and has higher patient satisfaction compared to traditional cold (ice) applications. (Friscia et al., 2022). Since effective pain management after OGS will also affect the success of the surgery, it is recommended that electrotherapy modalities be added to the treatment program in addition to pharmacological agents (Navarro-Fernández et al., 2023).

3.3. Manual Lymphatic Drainage

The occurrence of edema following OGS is an expected facet of recovery. Edema is characterized by the accumulation of plasma proteins within the interstitial tissue. The condition manifests when lymphatic circulation exceeds its threshold or when the efficacy of protein absorption and transport is compromised.Excessive postoperative edema and swelling in the face and neck region can increase pain and the risk of infection, narrow the airway opening and pose a risk to maintaining the individual's health. In addition to the functional complications it creates, edema can also lead to emotional and psychological problems by increasing anxiety as it disrupts the individual's body image (Van de Velde et al., 2020; Yaedú et al., 2017). Vodder first described manual lymphatic drainage (MLD) in the 1930s, and it is a treatment method that aims to eliminate excess plasma proteins by restoring the balance between lymphatic protein load and lymphatic system carrying capacity. For this, movements that follow the flow of the lymphatic tract are used, and a slow and gentle pressure is applied (approximately 30–40 mm Hg) so that the lymphatic capillaries do not become compressed or damaged. MLD increases lymphatic drainage by stretching the area with the hand toward the lymphatic flow and intermittent pressure. MLD is effectively used in the treatment of lymphedema associated with breast cancer after breast surgery. MLD is a treatment method used to control and reduce edema after surgery. Several studies have been conducted on MLD to reduce postoperative edema in maxillofacial surgery (Van de Velde et al., 2020; Yaedú et al., 2017).

In a case series, MLD applied after an impacted third molar tooth was shown to reduce pain and swelling in individuals on the sixth day after extraction (Szolnoky et al., 2007). In addition, in 2017, Yaedu et al. In a randomized controlled trial, they evaluated the short-term effects of MLD on facial edema and pain

in patients undergoing OGS One group received cryotherapy and medical treatment, while the other group received MLD in addition to these treatments for five consecutive days starting from the second day after surgery. The authors concluded that MLD effectively reduced facial edema after a one-week follow-up with photography (Yaedú et al., 2017). In a randomized controlled trial by Frederic et al., the effectiveness of MLD after OGS was evaluated with three-dimensional facial analysis. It was reported that MLD reduced edema in the facial region and improved patient-reported pain levels and perception of swelling after surgery. This improvement in clinical symptoms also accelerates the return of individuals to daily and social life after surgery (Van de Velde et al., 2020). The results of a few studies conducted on this subject show that MLD applied in the early period after OGS reduces edema and swelling according to 3-dimensional facial scanning and photographic tracking systems. However, MLD has no effect on pain associated with edema. For this reason, adding MLD to the rehabilitation program is recommended to reduce edema early after OGS (Szolnoky et al., 2007; Van de Velde et al., 2020; Yaedú et al., 2017).

3.4. Kinesio-Taping

Edema, the most important complication after OGS negatively affects the individual's healing process and airway patency. In order to control the inflammatory process, pharmacological agents such as analgesics, antibiotics, and corticosteroids, as well as physiotherapy and rehabilitation applications such as cryotherapy and manual lymph drainage, are included in the treatment prescription. Treatment methods may be insufficient in providing pain control with edema. Easy-to-use, inexpensive, and accessible additional treatment methods are needed in this area (Lietz-Kijak et al., 2018; Tozzi et al., 2016). Developed by Dr. Kenzo Kase, kinesio taping has become quite popular in treating sports injuries and various musculoskeletal disorders. It has been reported that kinesio taping reduces pain by supporting the joint and muscle in the application area and increasing blood and lymph flow. Recently, kinesio taping has also been widely used to treat lymphedema. Taping should be done considering the direction of lymphatic drainage (Lietz-Kijak et al., 2018; Tozzi et al., 2016). A randomized controlled study conducted by Tozzi et al. showed that the swelling increase was lower in the kinesio-taping group than in the non-taping group. It was stated that the decrease in the edema was higher in the kinesio-taping group than in the non-taping group. However, it was found that the pain intensity perceived by the individuals and the mouth-opening measurements were similar in the kinesio-taping and non-taping groups (Tozzi et al., 2016). In a study conducted by Lietz-Kijak et al., it was shown that kinesio taping applied after OGS reduced the size of the swelling in the face (Lietz-Kijak et al., 2018). Kinesio tape is a cotton tape with an adhesive material designed to allow 30-40% longitudinal flexibility, it is non-allergic, heat-sensitive, waterproof, and allows airflow. It is applied with a suitable technique to create tension on the skin surface in the area to be treated. A pulling force is created on the skin surface under the taped area. This pulling force is thought to raise the skin surface, increase the space between the skin and the underlying connective tissue, and thus support blood and lymph flow. According to some studies, kinesio taping reduces the pressure on nociceptors, facilitating pain relief. However, more studies need to be done to prove whether it can reduce the need for additional medications such as steroid use. In addition,

*Corresponding author alpindegirmenci@comu.edu.tr

DOI: 10.56061/fbujohs.1646549

since individuals continue to use analgesic medications after treatment, research is needed to prove the mechanism of action on pain. Kinesio taping can be safely applied in addition to existing treatments for edema and pain control after OGS because it is an easy-to-apply, inexpensive, and safe method with very few side effects (Lietz-Kijak et al., 2018; Tozzi et al., 2016).

4. Conclusion

Pain and edema that occur in the early period after OGS are among the most important complications that need to be managed. This inflammatory process can negatively affect the individual's range of motion in the jaw joint and delay the functional recovery process. A rehabilitation program should be created by determining short- and long-term goals appropriate to the individual's specific assessment. It is recommended that the rehabilitation program be started as early as possible after surgery and that the treatment program be progressed by the individual's symptoms and functional and clinical status.

Authors Contributions

Topic selection: AD; Design: AD, ÖÖ; Planning: AD, ÖÖ; Data collection and analysis: AD, ÖÖ; Writing of the manuscript: AD, ÖÖ; Critical review: AD, ÖÖ.

Conflict of Interest

There is no conflict of interest.

References

Bär, A. K., Werkmeister, R., Dort, J. C., & Al-Nawas, B. (2024). Perioperative care in orthognathic surgery - A systematic review and meta-analysis for enhanced recovery after surgery. Journal of Cranio-Maxillofacial Surgery, 52(August), 1244–1258. https://doi.org/10.1016/j.jcms.2024.08.014 M4

Cacho, A., Tordera, C., & Colmenero, C. (2022). Use of Transcutaneous Electrical Nerve Stimulation (TENS) for the Recovery of Oral Function after Orthognathic Surgery. Journal of Clinical Medicine, 11(12). https://doi.org/10.3390/jcm11123268

Chohan, M., Liu, W., & Chowdhury, T. (2024). Perioperative adverse cardiac events in maxillofacial surgery: A systematic review and meta-analysis. Indian Journal of Anaesthesia, 68(5), 426–438. https://doi.org/10.4103/ija.ija_1206_23 PM - 38764965

De Meurechy, N. K. G., Loos, P. J., & Mommaerts, M. Y. (2019). Postoperative Physiotherapy After Open Temporomandibular Joint Surgery: A 3-Step Program. In Journal of Oral and Maxillofacial Surgery (Vol. 77, Issue 5, pp. 932–950). W.B. Saunders. https://doi.org/10.1016/j.joms.2018.12.027

de Oliveira, Z. S. B., da Silveira, M. L. M., Gomes, P. P., da Silva, J. S. P., & Germano, A. R. (2021a). Early recovery after surgery protocol in orthognathic surgery: A randomized, blind clinical study. Brazilian Oral Research, 35, 1–11. https://doi.org/10.1590/1807-3107bor-2021.vol35.0087

de Oliveira, Z. S. B., da Silveira, M. L. M., Gomes, P. P., da Silva, J. S. P., & Germano, A. R. (2021b). Early recovery after surgery protocol in orthognathic surgery: A randomized, blind clinical study. Brazilian Oral Research, 35, 1–11. https://doi.org/10.1590/1807-3107bor-2021.vol35.0087

Friscia, M., Seidita, F., Committeri, U., Troise, S., Abbate, V., Bonavolontà, P., Orabona, G. D., & Califano, L. (2022). Efficacy of Hilotherapy face mask in improving the trend of edema after orthognathic surgery: a 3D analysis of the face using a facial scan app for iPhone. Oral and Maxillofacial Surgery, 26(3), 485–490. https://doi.org/10.1007/s10006-021-01015-0

Goñi-Viguria, R., Yoldi-Arzoz, E., Casajús-Sola, L., Aquerreta-Larraya, T., Fernández-Sangil, P., Guzmán-Unamuno, E., & Moyano-Berardo, B. M. (2018). Respiratory physiotherapy in intensive care unit: Bibliographic review. In Enfermeria Intensiva (Vol. 29, Issue 4, pp. 168–181). Ediciones Doyma, S.L. https://doi.org/10.1016/j.enfi.2018.03.003

American Association of Oral and Maxillofacial Surgeons. (2025). Clinical Paper-Indications for Orthognathic Surgery. https://aaoms.org/wp-content/uploads/2025/01/ortho_indications.pdf

Joachim, M. V., & Miloro, M. (2025). Multimodal approaches to postoperative pain management in orthognathic surgery: a comprehensive review. International Journal of Oral and Maxillofacial Surgery. https://doi.org/10.1016/j.ijom.2025.02.004

Joseph, A. E., Moman, R. N., Barman, R. A., Kleppel, D. J., Eberhart, N. D., Gerberi, D. J., Murad, M. H., & Hooten, W. M. (2022). Effects of Slow Deep Breathing on Acute Clinical Pain in Adults: A Systematic Review and Meta-Analysis of Randomized Controlled Trials. Journal of Evidence-Based Integrative Medicine, 27. https://doi.org/10.1177/2515690X221078006

Ko, E. W. C., Teng, T. T. Y., Huang, C. S., & Chen, Y. R. (2015b). The effect of early physiotherapy on the recovery of mandibular function after orthognathic surgery for class III correction. Part II: Electromyographic activity of masticatory muscles. Journal of Cranio-Maxillofacial Surgery, 43(1), 138–143. https://doi.org/10.1016/j.jcms.2014.10.028

Larsen, M. K. (2017). Indications for orthognathic surgery—A review. OHDM, 16(02), 1-13.

Lietz-Kijak, D., Kijak, E., Krajczy, M., Bogacz, K., Łuniewski, J., & Szczegielniak, J. (2018). The impact of the use of kinesio taping method on the reduction of swelling in patients after orthognathic surgery: A pilot study. Medical Science Monitor, 24, 3736–3743. https://doi.org/10.12659/MSM.909915

Miskovic, A., & Lumb, A. B. (2017). Postoperative pulmonary complications. In British Journal of Anaesthesia (Vol. 118, Issue 3, pp. 317–334). Oxford University Press. https://doi.org/10.1093/bja/aex002

Naran, S., Steinbacher, D. M., & Taylor, J. A. (2018). Current Concepts in Orthognathic Surgery. Plastic and Reconstructive Surgery, 141(6), 925e–936e. https://doi.org/10.1097/PRS.0000000000004438 PM - 29794714

Navarro-Fernández, G., Gil-Martínez, A., Diaz-Saez, M. C., Elizagaray-Garcia, I., Pili-Mayayo, P. Q., Ocampo-Vargas, J. E., & Beltran-Alacreu, H. (2023). Effectiveness of Physical Therapy in Orthognathic Surgery Patients: A Systematic Review of Randomized Controlled Trials. In Journal of Functional Morphology and Kinesiology (Vol. 8, Issue 1). MDPI. https://doi.org/10.3390/jfmk8010017

Phillips, C., Essick, G., Preisser, J. S., & Tucker, M. (2007). Sensory Retraining following Orthognathic Surgery: Effect on Patient Perception of Altered Sensation. In J Oral Maxillofac Surg (Vol. 65, Issue 6).

Phillips, C., Kim, S. H., Tucker, M., & Turvey, T. A. (2010). Sensory retraining: Burden in daily life related to altered sensation after orthognathic surgery, a randomized clinical trial. Orthodontics and Craniofacial Research, 13(3), 169–178. https://doi.org/10.1111/j.1601-6343.2010.01493.x

Szolnoky, G., Szendi-Horváth, K., Seres, L., Boda, K., & Kemény, L. (2007). MANUAL LYMPH DRAINAGE EFFICIENTLY REDUCES POSTOPERATIVE FACIAL SWELLING AND DISCOMFORT AFTER REMOVAL OF IMPACTED THIRD MOLARS. In Lymphology (Vol. 138).

Te Veldhuis, E. C., Te Veldhuis, A. H., Bramer, W. M., Wolvius, E. B., & Koudstaal, M. J. (2017). The effect of orthognathic surgery on the temporomandibular joint and oral function: a systematic review. International Journal of Oral and Maxillofacial Surgery, 46(5), 554–563. https://doi.org/10.1016/j.ijom.2017.01.004 PM - 28174061

Teng, T. T. Y., Ko, E. W. C., Huang, C. S., & Chen, Y. R. (2015a). The Effect of early physiotherapy on the recovery of mandibular function after orthognathic surgery for Class III correction: Part i - Jaw-motion analysis. Journal of Cranio-Maxillofacial Surgery, 43(1), 131–137. https://doi.org/10.1016/j.jcms.2014.10.025

Tozzi, U., Santagata, M., Sellitto, A., & Tartaro, G. P. (2016). Influence of Kinesiologic Tape on Post-operative Swelling After Orthognathic Surgery. Journal of Maxillofacial and Oral Surgery, 15(1), 52–58. https://doi.org/10.1007/s12663-015-0787-0

Van de Velde, F. E. G., Ortega-Castrillon, A., Thierens, L. A. M., Claes, P., & De Pauw, G. A. M. (2020). The effect of manual lymphatic drainage on patient recovery after orthognathic surgery—A qualitative and 3-dimensional facial analysis. Oral Surgery, Oral Medicine, Oral Pathology and Oral Radiology, 130(5), 478–485. https://doi.org/10.1016/j.oooo.2020.05.017

*Corresponding author alpindegirmenci@comu.edu.tr

DOI: 10.56061/fbujohs.1646549

Weber Jr, T. M., Taylor, K. J., Squier, B., Dammling, C. W., & Kinard, B. E. (2024). Perioperative management in orthognathic surgery—a narrative review. Journal of Oral and Maxillofacial Anesthesia, 3, 18–18. https://doi.org/10.21037/joma-24-14

Wolford, L. M., Rodrigues, D. B., & Limoeiro, E. (2011a). Orthognathic and TMJ surgery: Postsurgical patient management. Journal of Oral and Maxillofacial Surgery, 69(11), 2893–2903. https://doi.org/10.1016/j.joms.2011.02.066

Yaedú, R. Y. F., Mello, M. D. A. B., Tucunduva, R. A., Da Silveira, J. S. Z., Takahashi, M. P. M. S., & Valente, A. C. B. (2017). Postoperative Orthognathic Surgery Edema Assessment with and Without Manual Lymphatic Drainage. Journal of Craniofacial Surgery, 28(7), 1816–1820. https://doi.org/10.1097/SCS.0000000000003850

Yang, H. J., Kwon, I. J., Almansoori, A. A., Son, Y., Kim, B., Kim, S. M., & Lee, J. H. (2020). Effects of chewing exerciser on the recovery of masticatory function recovery after orthognathic surgery: A single-center randomized clinical trial, a preliminary study. Medicina (Lithuania), 56(9), 1–10. https://doi.org/10.3390/medicina56090483

Zhang, L., Hu, W., Cai, Z., Liu, J., Wu, J., Deng, Y., Yu, K., Chen, X., Zhu, L., Ma, J., & Qin, Y. (2019). Early mobilization of critically ill patients in the intensive care unit: A systematic review and meta-analysis. PLoS ONE, 14(10). https://doi.org/10.1371/journal.pone.0223185

*Corresponding author alpindegirmenci@comu.edu.tr

DOI: 10.56061/fbujohs.1646549