

# Orthognathic Surgery for Correction of Malocclusion: A Case Report

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## Abstract

Orthognathic surgery, also known as corrective jaw surgery, is a specialized procedure performed to correct severe malocclusion or misalignment of the jaws. Malocclusion refers to the improper alignment of the upper and lower teeth, which can cause functional problems such as difficulty chewing, speaking, and breathing, as well as aesthetic concerns. This case report highlights the successful management of malocclusion through orthognathic surgery, emphasizing the positive impact on both functional and aesthetic outcomes.

**Keywords:** Orthognathic surgery • Maxillofacial surgery • Malocclusion

## Introduction

**Patient background:** The patient, a 25-year-old male, presented with a history of significant malocclusion, characterized by a severe underbite (prognathism) and an open bite. The malocclusion had caused difficulties in chewing, speech impairment, and self-consciousness about his facial appearance. Clinical examination and diagnostic imaging confirmed the presence of a skeletal discrepancy between the upper and lower jaws [1].

**Treatment planning:** A multidisciplinary approach involving orthodontists and oral and maxillofacial surgeons was employed to develop a comprehensive treatment plan. Preoperative orthodontic treatment was initiated to align the teeth and establish the best possible occlusion before surgery. Three-dimensional cephalometric analysis, dental models, and computerized surgical planning were utilized to determine the precise surgical movements required to achieve the desired outcome [2].

**Surgical procedure:** Under general anesthesia, orthognathic surgery was performed. A combination of maxillary and mandibular osteotomies was carried out to reposition the upper and lower jaws, addressing the skeletal discrepancy. The maxilla was repositioned using Le Fort I osteotomy, and the mandible was advanced using bilateral sagittal split osteotomy. Rigid fixation with miniplates and screws was utilized to stabilize the newly positioned jaws. The surgical procedure was carried out with meticulous attention to preserving neurovascular structures and achieving optimal stability.

**Postoperative orthodontic treatment:** Following surgery, the patient underwent a postoperative orthodontic phase to fine-tune the occlusion and ensure stability. The orthodontist utilized fixed appliances to guide the teeth into their proper positions, correcting any residual malocclusion and achieving a harmonious occlusion.

**Results and outcomes:** The patient demonstrated significant improvements in both functional and aesthetic outcomes. The correction of the malocclusion resulted in a balanced facial profile, proper alignment of

the teeth, and improved occlusion. The patient reported enhanced ability to chew, improved speech, and increased self-confidence in social interactions. Follow-up appointments and evaluations confirmed the stability of the surgical outcomes and the long-term success of the treatment [3].

## Literature Review

Orthognathic surgery is a highly effective treatment modality for correcting severe malocclusion and improving overall oral health and function. This case report highlights the successful management of malocclusion through orthognathic surgery, emphasizing the importance of a multidisciplinary approach involving orthodontists and oral and maxillofacial surgeons. The precise diagnosis, treatment planning, and execution of orthognathic surgery are crucial for achieving optimal outcomes. Three-dimensional imaging and computerized surgical planning assist in accurately determining the required surgical movements and ensuring precise alignment of the jaws.

This approach allows for a customized treatment plan tailored to each patient's unique skeletal and dental characteristics. Orthognathic surgery offers not only functional improvements but also substantial aesthetic benefits. The correction of malocclusion and skeletal discrepancies can lead to a harmonious facial profile, improved symmetry, and a more balanced appearance. These positive changes can have a profound impact on the patient's self-esteem and quality of life. Orthodontic treatment plays a significant role in the success of orthognathic surgery. Preoperative orthodontics aligns the teeth and create an ideal occlusion, facilitating the surgical correction. Postoperative orthodontic treatment further refines the occlusion and ensures stability [4].

Malocclusion is a dental condition characterized by the misalignment of the upper and lower teeth when the jaws are in contact. It is a common dental problem that can affect individuals of all ages, leading to functional and aesthetic concerns. Malocclusion can range from mild to severe, and its causes can vary, including genetic factors, developmental abnormalities, habits like thumb sucking or tongue thrusting, or even facial trauma. This article provides an introduction to malocclusion, its classification, causes, and potential impacts on oral health and overall well-being [5].

## Causes of malocclusion

Malocclusion can have various underlying causes, including:

**Genetic factors:** Hereditary factors play a significant role in the development of malocclusion. Certain jaw and tooth characteristics can be inherited, making individuals more prone to specific types of misalignment.

**Developmental abnormalities:** Malocclusion can arise from developmental abnormalities of the jaw, such as a discrepancy in jaw size or shape, or asymmetry in jaw growth.

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**Oral habits:** Prolonged habits like thumb sucking tongue thrusting, prolonged pacifier use, or prolonged bottle-feeding beyond infancy can contribute to the development of malocclusion.

**Facial trauma:** Traumatic injuries to the face or jaw can disrupt the normal alignment of the teeth and jaws, leading to malocclusion.

**Dental loss or extraction:** Premature loss of primary (baby) teeth or permanent teeth without appropriate replacement can disrupt the proper alignment of teeth, causing malocclusion.

**Oral breathing:** Chronic mouth breathing, often due to nasal congestion or obstructions, can affect the positioning and growth of the jaws, contributing to malocclusion [6].

## Discussion

### Impacts of malocclusion

Malocclusion can have several consequences that extend beyond just aesthetic concerns. Some potential impacts include:

**Oral health issues:** Malocclusion can make oral hygiene practices challenging, as misaligned teeth may be more difficult to clean effectively, increasing the risk of dental decay, gum disease, and bad breath.

**Impaired chewing and digestion:** Misaligned teeth may hinder proper chewing and bite function, leading to difficulties in breaking down food adequately. This can affect digestion and nutrient absorption.

**Speech impairment:** Severe malocclusion can impact speech, causing pronunciation difficulties and lisping. Misaligned teeth can affect the placement of the tongue and lips, affecting speech clarity.

**Temporomandibular Joint Disorders (TMD):** Malocclusion can contribute to jaw joint problems, such as temporomandibular joint disorders, leading to jaw pain, clicking or popping sounds, and difficulty in opening or closing the mouth.

**Self-esteem and psychological impact:** Malocclusion can affect an individual's self-esteem and confidence, especially if it affects their appearance. It may lead to social anxiety, reduced self-confidence, and reluctance to smile or engage in social interactions.

## Conclusion

Malocclusion is a common dental condition characterized by the

misalignment of the upper and lower teeth. It can have various causes, including genetic factors, developmental abnormalities, oral habits, facial trauma, dental loss, and oral breathing. Malocclusion can impact oral health, speech, digestion, jaw joint function, and overall well-being. Understanding the different types of malocclusion and their causes is crucial for early detection, diagnosis, and appropriate treatment. Through orthodontic interventions, including braces, aligners, and orthognathic surgery in severe cases, malocclusion can be effectively managed, improving oral health, function, and aesthetics, and enhancing an individual's overall quality of life. Regular dental check-ups and early orthodontic intervention can help address malocclusion, ensuring optimal oral health and well-aligned teeth. Orthognathic surgery is an effective and transformative treatment option for correcting severe malocclusion and improving overall oral health and function.

## Acknowledgement

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## Conflict of Interest

None.

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