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Orthognathic Surgery for Correction of Skeletal Class III Malocclusion: A Case Report

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Introduction

Skeletal Class III malocclusion, characterized by a prominent lower jaw and/or a retruded upper jaw, is a challenging dental condition that affects both the function and aesthetics of the face. Orthognathic surgery, a comprehensive approach combining orthodontics and maxillofacial surgery, offers an effective treatment option for correcting severe skeletal discrepancies. This case report presents the successful management of a patient with skeletal Class III malocclusion through orthognathic surgery, highlighting the diagnostic process, treatment planning, surgical procedure, and postoperative outcomes.

Patient presentation

A 23-year-old female presented with concerns regarding her facial appearance, difficulty chewing, and an improper bite. Clinical examination revealed a concave facial profile, an anterior crossbite, and a Class III molar relationship. Panoramic radiograph and lateral cephalometric analysis confirmed the presence of a skeletal Class III malocclusion with a retruded maxilla and a protruded mandible [1].

Diagnosis and treatment planning

Based on the clinical and radiographic findings, a diagnosis of skeletal Class III malocclusion was established. The treatment plan involved a multidisciplinary approach, including preoperative orthodontic preparation, orthognathic surgery, and postoperative orthodontic management. The treatment goals included achieving a harmonious facial profile, correcting the malocclusion, and improving functional occlusion [2].

Preoperative orthodontic preparation

The patient underwent comprehensive orthodontic treatment in the preoperative phase to align the dental arches, level and coordinate the occlusal plane, and establish proper interarch relationships. The use of fixed appliances, including brackets and archwires, facilitated the dental alignment and achieved the necessary tooth movements to facilitate the surgical correction [3].

Surgical procedure

Under general anesthesia, the surgical correction of the skeletal Class III malocclusion was performed. A combination of maxillary advancement and mandibular setback was planned to achieve the desired occlusal and facial aesthetic outcomes. The surgical procedure involved intraoral incisions, osteotomies of the maxilla and mandible, repositioning of the jaw segments, and rigid fixation with miniplates and screws. Careful attention was given to maintain stability and achieve optimal occlusion.

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Description

Postoperative orthodontic management

Following the surgery, the patient underwent postoperative orthodontic treatment to fine-tune the occlusion, achieve dental interdigitation, and stabilize the achieved skeletal correction. The use of elastics and adjustments of the orthodontic appliances facilitated the final dental alignment and ensured long-term stability of the occlusion [4].

Follow-up and outcomes

The patient was followed up at regular intervals postoperatively to assess healing, monitor occlusal changes, and evaluate treatment outcomes. Clinical and radiographic examinations confirmed a significant improvement in facial aesthetics, occlusal relationships, and functional bite. The patient reported enhanced chewing ability, improved speech, and a boost in self-confidence. Orthognathic surgery represents a valuable treatment modality for the correction of skeletal Class III malocclusion. It addresses not only the dental occlusion but also the underlying skeletal discrepancies. The successful outcome of the case report highlights the importance of accurate diagnosis, multidisciplinary treatment planning, meticulous surgical technique, and postoperative orthodontic management [5].

Orthognathic surgery allows for precise repositioning of the maxilla and mandible, bringing the jaws into proper alignment and improving facial harmony. The procedure enhances both the aesthetic and functional aspects of the patient's smile, speech, and chewing abilities. Furthermore, the multidisciplinary approach involving collaboration between orthodontists and maxillofacial surgeons ensures comprehensive and coordinated care throughout the treatment process. Orthognathic surgery is a valuable treatment option for patients with skeletal Class III malocclusion. This case report demonstrates the successful correction of a skeletal Class III malocclusion through a combination of preoperative orthodontic preparation, orthognathic surgery, and postoperative orthodontic management. The patient achieved improved facial aesthetics, occlusal relationships, and functional bite, leading to enhanced quality of life. With careful diagnosis, treatment planning, and interdisciplinary collaboration, orthognathic surgery offers a transformative solution for patients with severe skeletal malocclusions, restoring both form and function to the oral and facial structures.

Malocclusion is a prevalent dental condition characterized by the misalignment of teeth and/or jaws, resulting in an improper bite. It affects individuals of all ages, from children to adults, and can have significant functional and aesthetic implications. Malocclusion can manifest in various forms, such as overcrowding, spacing issues, crossbite, overbite, underbite, or a combination of these. Understanding the causes, types, and consequences of malocclusion is essential for effective diagnosis, treatment planning, and improving oral health.

Causes of malocclusion

Malocclusion can occur due to a combination of genetic and environmental factors. Some common causes include:

Genetic factors: Inherited traits play a significant role in the development of malocclusion. Genetic factors can influence jaw size and shape, tooth size and position, and the overall facial structure. These genetic variations can contribute to malocclusion tendencies within families. Dental Development:

Malocclusion can result from abnormal dental development, such as delayed eruption, premature loss of primary teeth, or abnormal growth patterns of permanent teeth. Factors like small dental arches, tooth size discrepancies, and improper alignment of teeth during eruption can contribute to malocclusion.

Habits and oral function: Certain habits or oral behaviors can lead to malocclusion. Prolonged thumb-sucking, prolonged pacifier use, tongue thrusting, mouth breathing, or incorrect swallowing patterns can exert pressure on the teeth and jaws, disrupting their normal alignment.

Dental trauma: Trauma or injury to the face or jaws can disrupt the normal alignment of teeth, leading to malocclusion. Fractures, avulsed teeth (knocked-out teeth), or jaw fractures can alter the positioning of teeth and result in malocclusion. Poor oral habits, such as persistent use of a bottle or pacifier beyond the appropriate age, can contribute to malocclusion. These habits can interfere with the natural growth and alignment of the teeth and jaws.

Conclusion

Malocclusion is a common dental condition that can affect individuals of all ages, causing functional, aesthetic, and oral health concerns. It can result from a combination of genetic and environmental factors, including dental development, habits, trauma, and oral function. Understanding the causes and consequences of malocclusion is essential for early detection, appropriate diagnosis, and effective treatment planning. Dentists and orthodontists play a crucial role in evaluating malocclusion, providing appropriate interventions, and improving the oral health and well-being of individuals affected by this condition.

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