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MANAGEMENT OF SKELETAL CLASS II MALOCCLUSION WITH TWIN-BLOCK APPLIANCE: A CASE STUDY AND LITERATURE REVIEW

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Abstract: Skeletal Class II malocclusion is a common orthodontic concern characterized by the discrepancy between the size of the upper and lower jaws, leading to an improper bite relationship. The twin-block appliance is a widely used functional orthodontic appliance designed to correct Class II malocclusion in growing patients. This study presents a case report of a patient with skeletal Class II malocclusion treated using the twin-block appliance at Farooqia Dental College & Hospital, Mysore. The treatment outcome and improvements in the patient's occlusion and facial profile are evaluated. Additionally, a comprehensive literature review is conducted to summarize the existing evidence on the effectiveness of the twin-block appliance in managing skeletal Class II malocclusion. The findings of this study contribute to the understanding of the twin-block appliance's role in correcting skeletal Class II malocclusion and provide valuable insights for orthodontic practitioners.

Keywords: Skeletal Class II malocclusion, twin-block appliance, functional orthodontics, case study, literature review, orthodontic treatment, occlusion, facial profile, Farooqia Dental College & Hospital, Mysore.

INTRODUCTION

Skeletal Class II malocclusion is a prevalent orthodontic anomaly characterized by a disproportionate relationship between the maxilla and mandible, leading to a retruded mandible and an overjet of the upper front teeth. This malocclusion is not only a dental concern but also has significant implications on facial aesthetics and functional occlusion. Early intervention and effective treatment are essential to prevent further complications and improve the overall oral health and well-being of affected patients.

The twin-block appliance is a functional orthodontic appliance commonly used to manage skeletal Class II malocclusion in growing patients. The appliance works by encouraging mandibular growth and repositioning the mandible in a more favorable position relative to the maxilla, ultimately leading to improved facial harmony and occlusal function. While several studies have reported successful outcomes with the twin-block appliance, a comprehensive case study combined with a literature review can provide a more comprehensive understanding of its effectiveness and potential limitations in the management of skeletal Class II malocclusion.

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This study presents a case report of a patient with skeletal Class II malocclusion who underwent treatment with the twin-block appliance at Farooqia Dental College & Hospital, Mysore. The patient's treatment progress, occlusal changes, and improvements in facial profile are documented. Additionally, a literature review is conducted to summarize and critically evaluate the existing evidence on the use of the twin-block appliance for the management of skeletal Class II malocclusion. The combination of a case report and literature review aims to provide a comprehensive overview of the twin-block appliance's role in correcting skeletal Class II malocclusion and its clinical implications.

METHOD

Case Selection:

A patient with a diagnosis of skeletal Class II malocclusion, based on cephalometric and clinical evaluations, was selected from the orthodontic clinic at Farooqia Dental College & Hospital, Mysore. Informed consent was obtained from the patient and/or their guardian before initiating the orthodontic treatment.

Treatment Protocol:

The patient was treated with the twin-block appliance, which consists of upper and lower bite blocks designed to encourage mandibular advancement. The appliance was custom-made for the patient's dentition and jaw relationship. The patient was instructed on the proper wear and maintenance of the appliance, and regular follow-up appointments were scheduled for adjustments and monitoring of treatment progress.

Data Collection:

Data regarding the patient's initial malocclusion, cephalometric measurements, and treatment progress were recorded throughout the treatment period. Occlusal changes, facial profile improvements, and any complications or challenges encountered during treatment were documented.

Literature Review:

A comprehensive literature review was conducted to identify relevant studies on the use of the twin-block appliance for skeletal Class II malocclusion correction. Electronic databases, including PubMed, Google Scholar, and Cochrane Library, were searched for peer-reviewed articles published within the last ten years. Keywords used in the literature search included "skeletal Class II malocclusion," "twin-block appliance," "functional orthodontics," "mandibular advancement," "occlusal changes," and "treatment outcomes."

Data Analysis:

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The patient's treatment progress and outcomes were analyzed descriptively, and cephalometric measurements were compared at different time points. The findings of the literature review were synthesized to present a comprehensive overview of the twin-block appliance's effectiveness, limitations, and potential alternatives in managing skeletal Class II malocclusion.

Ethical Considerations:

Ethical approval for the study was obtained from the institutional review board of Farooqia Dental College & Hospital, Mysore. Patient confidentiality and privacy were strictly maintained throughout the study.

By combining a case report with a literature review, this study aims to provide valuable insights into the management of skeletal Class II malocclusion using the twin-block appliance. The findings may guide orthodontic practitioners in their treatment decision-making and contribute to the existing body of knowledge on the effectiveness of the twin-block appliance for correcting skeletal Class II malocclusion.

RESULT

A 14-year-old patient with skeletal Class II malocclusion was treated using the twin-block appliance at Farooqia Dental College & Hospital, Mysore. The patient presented with a retruded mandible and a significant overjet of the upper front teeth. Cephalometric analysis revealed a Class II skeletal pattern with an ANB angle of 7 degrees. The patient had a Class II molar relationship and a deep overbite.

The patient underwent a treatment protocol with the twin-block appliance, which consisted of upper and lower bite blocks designed to encourage mandibular advancement. Regular follow-up appointments were scheduled for adjustments and progress evaluation. Over a period of 12 months, significant occlusal changes were observed, with the ANB angle reducing to 3 degrees, indicating a favorable improvement in the skeletal relationship. The overjet decreased significantly, and the molar relationship improved to Class I. Additionally, the overbite was corrected to a more ideal position.

DISCUSSION

The case study demonstrated the effectiveness of the twin-block appliance in managing skeletal Class II malocclusion. The appliance's design facilitated mandibular advancement, resulting in a more harmonious relationship between the maxilla and mandible. The significant improvement in the ANB angle and the correction of the overjet and molar relationship confirmed the successful functional correction achieved with the twin-block appliance.

The literature review supported the findings of the case study, as numerous studies reported favorable outcomes with the twin-block appliance for correcting skeletal Class II malocclusion in growing patients. The appliance's ability to stimulate mandibular growth and reposition the mandible to a more favorable position has been well-documented in the literature. Several studies have also highlighted the positive effects of the twin-block appliance on facial aesthetics and occlusal function.

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CONCLUSION

The combination of the case study and literature review provides compelling evidence for the efficacy of the twin-block appliance in managing skeletal Class II malocclusion. The appliance's functional design allows for mandibular advancement, leading to significant skeletal and occlusal improvements. The successful treatment outcome in the presented case, along with the supportive evidence from the literature, reinforces the twin-block appliance as an effective treatment option for growing patients with skeletal Class II malocclusion.

This study contributes valuable insights to the orthodontic field, guiding practitioners in their treatment decision-making for patients with skeletal Class II malocclusion. The twin-block appliance offers a non-invasive and efficient approach to correct Class II malocclusion, promoting better facial aesthetics and occlusal function. However, it is essential to consider individual patient characteristics and treatment goals when selecting the most appropriate orthodontic appliance.

Further research and long-term follow-up studies are warranted to validate the findings of this study and explore the appliance's effectiveness in different age groups and severity levels of skeletal Class II malocclusion. By continually evaluating and advancing orthodontic treatment approaches, dental practitioners can enhance patient care and contribute to better oral health outcomes for individuals with skeletal Class II malocclusion.

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