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Orthodontic Management of Malocclusion Class 2 – Division 2 And Deep Bite: A Case Report

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Abstract:
Background*: Class II Division 2 malocclusion associated with a deep bite represents a considerable challenge in orthodontic treatment.*
Materials and Methods*: The purpose of this case report was to describe the successful treatment of a 17-year-old male patient presenting with retroclined maxillary incisors and Class II molar and canine relationships. A non-extraction treatment approach involving fixed orthodontic appliances, sequential archwire progression, and Class II elastics was used to correct the existing malocclusion.*
Results*: The use of bite turbos on the central incisors, combined with passive eruption of the posterior teeth and Class II elastics, offers a controlled method for anterior intrusion and correction of the deep overbite, while improving both functional and aesthetic outcomes.*
Conclusion: *This case demonstrates the effectiveness of controlled force application in growing patients and emphasizes its potential to achieve stable and predictable orthodontic results.*
Key Word*: Class II Division 2 malocclusion, deep bite, non-extraction treatment, bite turbos.*

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I. Introduction

Deep bite malocclusion is commonly managed through intrusion of the anterior teeth, extrusion of the posterior teeth, or a combination of both approaches in either or both dental arches. [1-5] The selection of an appropriate treatment strategy should be based on the patient's underlying skeletal pattern and overall occlusal characteristics, with the aim of achieving facial harmony, functional occlusion and long-term treatment stability. [6] Individuals with Class II Division 2 malocclusion often exhibit distinctive soft-tissue characteristics. Their facial profile is typically characterized by relatively sharp facial contours, a concave appearance of the lower third of the face, a prominent nose and chin, a thin vermilion, and retruded lips. The oral commissure and rima oris are positioned relatively high, which may result in increased gingival display of the maxillary anterior region during smiling, commonly referred to as a "gummy smile." According to some authors, Class II Division 2 malocclusion has limited influence on the overall facial profile. However, other studies have reported that patients with this malocclusion may experience dissatisfaction primarily related to facial appearance and smile aesthetics, particularly because of excessive gingival display or a "gummy smile." This aesthetic concern is frequently reported as one of the main reasons for seeking orthodontic treatment. [7] In patients with severe skeletal Class II discrepancies who have completed growth, two principal treatment options can be considered: orthodontic camouflage or combined orthodontic–orthognathic surgical treatment. [8] When patients are not primarily concerned with facial appearance or do not wish to undergo orthognathic surgery, and when no significant functional problems are present, camouflage treatment aims to compensate for the underlying skeletal discrepancy through dentoalveolar movements. In such cases, extraction of the maxillary first or second premolars may be indicated to facilitate retraction of the maxillary incisors and compensate for the sagittal discrepancy. [9] The selection of the appropriate treatment approach depends on several factors, including the severity of the skeletal discrepancy, the relationship and harmony of the soft tissues involving the nose, lips, and chin, as well as the patient's expectations and motivation. [10] In patients presenting with mild-to-moderate skeletal Class II discrepancies, orthodontic camouflage may represent an appropriate treatment alternative. The initial phase may involve controlled intrusion and proclination of the maxillary incisors to correct the deep bite

and improve the incisor relationship. Another important aspect of treatment is the unlocking of the malocclusion. By modifying the occlusal contacts and allowing a more favourable mandibular path of closure, improvement of the sagittal molar relationship may be facilitated. In the present case, bite turbos were bonded to the maxillary central incisors, producing posterior disclusion and allowing passive eruption of the previously disarticulated posterior teeth. This approach facilitated correction of the deep bite while maintaining controlled anterior tooth movement. During the active phase of treatment, Class II intermaxillary elastics were incorporated to assist in the correction of the sagittal molar and canine relationships.

II. Material And Methods

A 17-year-old male patient presented to the clinic seeking improvement of his smile. His primary concern was the appearance of the maxillary anterior teeth, which exhibited limited clinical exposure and a pronounced retroclination. Clinical examination and panoramic radiographic assessment revealed a complete dentition with all permanent teeth present and no history of extractions (Fig. 1).



Figure 1. Panoramic radiograph.

Intraoral examination revealed bilateral Class II molar and canine relationships, an overjet of 1mm and an overbite of 5mm. The periodontal tissues were in good clinical condition. The only dental anomaly identified was reduced mesiodistal dimensions of the maxillary lateral incisors (Fig. 2).



Figure 2. Intraoral photo before treatment – frontal segment and right lateral segment.

Cephalometric evaluation demonstrated an increased ANB angle of 7,9°, an interincisal angle of 141,9°, retroclination of the maxillary incisors, maxillary prognathism, and a predominantly horizontal growth pattern (Fig. 3).



Figure 3. Cephalometric radiograph

The primary treatment objectives were to correct the deep overbite, establish bilateral Class I molar and canine relationships, achieve proper alignment and coordination of the dental arches, improve the inclination and position of the maxillary incisors, and establish a stable and functional occlusion. A non-extraction treatment approach with fixed orthodontic appliances was selected. Bite turbos were bonded to the maxillary incisors to disarticulate the posterior teeth and facilitate correction of the deep bite through controlled anterior tooth movement and passive eruption of the posterior segments. Class II mechanics were subsequently incorporated to assist in correction of the sagittal dental relationships.

TREATMENT PROGRESS

Treatment was initiated with the placement of metal brackets in the maxillary arch using the Roth prescription with a 0.022 × 0.028-inch slot. Initial levelling and alignment were performed with a sequence of NiTi archwires. The mandibular brackets were bonded six weeks after placement of the maxillary appliance. This delay was necessary to allow sufficient proclination of the maxillary incisors and prevent direct occlusal interference between the mandibular anterior brackets and the palatal surfaces of the maxillary incisors (Fig. 4).



Figure 4. Bonding of brackets in the upper jaw and placement of NiTi 0.012 Archwire.

Bite turbos were placed on the maxillary anterior teeth and the posterior teeth, which had been disarticulated by the bite turbos, were allowed to erupt passively, contributing to the correction of the deep bite. Following initial alignment and bite opening, Class II elastics were introduced using a 0.017 × 0.025-inch stainless-steel archwire to achieve controlled correction of the anterior tooth position. Class II intermaxillary elastics assisted in correcting the sagittal discrepancy and establishing a bilateral Class I molar relationship (Fig. 5).



Figure 5. Active phase of treatment – Placed Stainless steel 0.017 x 0.025 Archwire in Upper and lower jaw.

III. Result

Both functional and aesthetic objectives were successfully achieved. The patient's expectations and treatment-related concerns were satisfactorily addressed. Clinically, all predefined treatment objectives were accomplished, resulting in an improved facial profile and appropriate positioning and inclination of the maxillary incisors, with incisor display harmonized with the aesthetic smile line. The deep bite was successfully corrected, and a bilateral Class I sagittal relationship was established.

IV. Discussion

In patients with Class II malocclusion presenting with mild-to-moderate skeletal discrepancies, orthodontic camouflage through dental compensation can be considered an appropriate treatment approach. Conventional treatment options may include incisor proclination, interproximal enamel reduction, and dental extractions, depending on the severity and characteristics of the malocclusion. [11] Non-extraction treatment is generally considered when the arch length discrepancy is less than approximately 5 mm. [12] In the present case,

the arch length deficiency was below 5 mm; therefore, a non-extraction approach was selected. In Class II Division 2 malocclusion, proclination of the retroclined incisors may help to decompensate the anterior dentition and "unlock" the mandible. This can facilitate a more favourable mandibular path of closure and contribute to improvement of the sagittal skeletal and dental relationship, particularly in younger patients. [13] Class II elastics are commonly used auxiliary components of fixed orthodontic treatment for Class II malocclusion correction since the early development of contemporary orthodontic mechanics. Their vertical force component may contribute to extrusion of the mandibular molars and maxillary incisors, potentially resulting in clockwise rotation of the occlusal plane and alterations in the smile line. Therefore, careful control of their biomechanical effects is necessary. According to Ackerman, in patients with a balanced facial profile and no significant lip strain, anterior proclination may be preferable to extraction as a means of addressing dental crowding. In the present case, the maxillary incisors were initially proclined to correct their retroclined position. The presence of a pronounced deep bite may also interfere with placement of the mandibular brackets because of direct contact between the upper incisors and the lower brackets. For this reason, orthodontic bonding was initiated in the maxillary arch. Once sufficient bite opening and anterior tooth movement had been achieved, the mandibular brackets were placed without significant occlusal interference. Considering the patient's skeletal and dental characteristics, including the existing overjet and arch length discrepancy, a non-extraction orthodontic camouflage approach was selected. The treatment aimed to correct the sagittal discrepancy while preserving facial harmony and achieving a functional and stable occlusal relationship.

V. Conclusion

The management of Class II Division 2 malocclusion associated with deep bite using Class II elastics represents an effective non-extraction treatment approach. The application of controlled and well-directed orthodontic forces resulted in significant dental and skeletal improvements, leading to a balanced, functional, and stable occlusal relationship. Sequential archwire progression, the use of bite turbos, passive eruption of the posterior teeth, and Class II intermaxillary elastics contributed to the correction of the deep bite and sagittal discrepancy while minimizing undesirable dental effects. This case emphasizes the importance of careful treatment planning and precise biomechanical control in achieving predictable and stable orthodontic outcomes.

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