

Bracket Placement According to Malocclusion

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Abstract: This article reports the orthodontic treatment of a 25-year-old female patient whose chief complaint was the inclination of the maxillary occlusal plane in front view. The individualized vertical placement of brackets is described. This placement made possible a symmetrical occlusal plane to be achieved in a rather straightforward manner without the need for further technical resources.

Keywords: Orthodontics; occlusal canting; bonding procedure.

Introduction

Occlusal canting is an esthetically displeasing component of the smile. This feature can be found regardless of the patient's facial asymmetry. It can be noticed from 1° of rotation,¹ and can also be perceived as an incisal plane difference of more than 1 mm.²

The diagnosis can be determined by linear differences between the medial canthi and cuspid tips bilaterally,³ two and three dimensional posteroanterior cephalometric analysis,⁴ or by simply comparing the parallelism of a wooden spatula across the right and left posterior teeth and the interpupillary plane.⁵

When it is the patient's chief complaint, its correction presents a challenge. The treatment plan may have to be formulated depending on the severity with which the maxillary posterior occlusal plane is canted.⁶ Surgical treatment is an option, but when no maxillomandibular discrepancy is present to justify this approach, a compensatory orthodontic treatment should be encouraged. In this article, we describe a streamlined, effective clinical procedure to address this issue.

Case Report

A 25-year-old female patient presented at the office for a second opinion as she had been advised to undergo orthognathic surgery in order to resolve her complaint. She had a mild frontal asymmetric face, but her only complaint was the asymmetric superior occlusal plane, notably on smiling, and consequently the lower arch followed these upper disharmonies, but to a lesser extent (Figures 1 and 2). She presented with a Class I relationship and mild lower teeth crowding that could be solved by stripping.

The treatment objectives focused on: (1) leveling the occlusal plane; (2) correcting maxillary incisor angulation; (3) equaling the maxillary right and left cuspid torque; and (4) decreasing the midline shift.

The treatment options were: (1) orthognathic surgery; however, the patient was satisfied with her facial aspect and rejected this approach; (2) temporary anchorage devices (TADs) to intrude the extruded left anterior upper segment; (3) a

differentiated vertical bonding of orthodontic brackets between the right and left sides of the maxillary arch to improve the effects of upper arch leveling.

The third option was chosen mainly because it was the simplest of the three, and offered the most predictable results. Ceramic standard edgewise 0.022" x 0.028" orthodontic brackets were placed on all teeth. The brackets on the upper right side were bonded at a higher position from the incisal/occlusal edge and at a lower position on the left side following a correct height relationship between them (i.e.: the lateral incisors placed 0.5mm more incisally than the central incisors) (Figure 3). Orthodontic leveling of the maxillary and mandibular arches were performed with nickel-titanium 0.014" and heat-activated 0.019" x 0.025" wires. Individualized stainless steel 0.019" x



Figure 1. Patient's smile at initial appointment. Notice the canted occlusal plane from the right to the left side.



Figure 2. Initial intraoral photograph. Notice the canted occlusal plane from the right to the left side.



Figure 3. Individualized vertical bonding of maxillary brackets: the brackets on the right side were bonded at a higher position from the incisal/occlusal edge and at a lower position on the left side

0.026" archwires were placed. The maxillary archwire received a substantial lingual crown torque in the left posterior side to counter the effects of intrusion, while force was applied outside the center of resistance of these teeth.

The patient was very pleased with the results. A symmetrical occlusal plane was obtained and incisor angulation corrected. Therefore, the proposed objectives were achieved (Figures 4 - 5).



Figure 4. Patient at debonding appointment.



Figure 5. Patient's smile at the end of treatment.

Discussion

A method for placing orthodontic brackets was described to address the main complaint of the patient, which was the inclination of the upper occlusal plane in front view, especially when smiling. The authors believe that this simple procedure can be used with predictable results in similar cases.

Patients with marked mandibular asymmetry and a canted maxillary occlusal plane can be treated with orthognathic surgery, or in less severe cases with bone anchored advices.^{7,8} TADs have been used to avoid orthognathic surgery in cases with good facial symmetry with a less severe canted occlusal plane.^{9,10} When no other problems are associated, orthodontic treatment alone can produce excellent results.

The role played by placing the bracket at different points along the long axis of the tooth is widely described in the literature, although it is related to placement error¹¹⁻¹⁴ besides improving the correction of deep overbite¹⁵ and open bite cases.¹⁶ One millimeter difference in vertical positioning could alter torque values up to 10 degrees.^{12,13} Intense posterior torque was applied to the left side of the maxillary archwire in order to oppose asymmetric torque in maxillary teeth.

The case reported here was treated by modifying the vertical positioning of the brackets on the right vs. left side of the maxillary arch. Properly positioning orthodontic brackets, and being aware that changes can be made in their position and height in different and particular types of malocclusions may benefit alignment and leveling and achieve excellent results with minimal resources.

Conclusion

Orthodontic treatment of the inclined maxillary occlusal plane was made possible only by resorting to the individualized placement of orthodontic brackets and torque control. This method has proven effective enough to solve most cases resembling the one described in this paper.

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