ODOVTOS
International Journal of Dental Sciences

UNIVERSIDAD DE COSTA RICA FOd Facultad de Odontología

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CASE REPORT:

Treatment of Proclined Upper Incisors with Reverse Bracket Placement: A Case Report

Tratamiento de incisivos superiores protruidos con colocación inversa de brackets: Informe de un caso

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Received: 10-II-2026 Accepted: 7-III-2026

ABSTRACT: Accurate bracket placement plays a key role in orthodontic treatment outcomes. This case report describes the management of a 21-year-old female presenting with labially inclined maxillary incisors and a midline diastema. Fixed appliance therapy was carried out with a specific adjustment; the brackets on the upper incisors were placed in reverse orientation to improve labial root torque and control the incisor inclination while avoiding additional auxiliaries or tooth extraction. After 25 months of treatment, the patient showed well-aligned teeth, a functional overjet and overbite, closure of the diastema, and a more pleasing smile. Radiographic evaluation suggested that root resorption was minimal. Reverse bracket placement may be a useful alternative in selected cases. Monitoring over time is still necessary to confirm long-term stability.

KEYWORDS: Orthodontics; Bracket placement; Case report; Root torque; Fixed appliance therapy; Proclination.

RESUMEN: La colocación precisa de los brackets desempeña un papel clave en los resultados del tratamiento ortodóncico. Este reporte de caso describe el manejo de una paciente de 21 años que presentaba incisivos maxilares inclinados hacia vestibular y un diastema en la línea media. El tratamiento con aparatología fija se llevó a cabo con un ajuste específico: los brackets en los incisivos superiores se colocaron en orientación invertida para mejorar el torque radicular labial y controlar la inclinación de los incisivos, evitando el uso de auxiliares adicionales o la extracción dentaria. Tras 25 meses de tratamiento, la paciente mostró dientes bien alineados, sobremordida horizontal y sobremordida vertical funcionales, cierre del diastema y una sonrisa más estética. La evaluación radiográfica sugirió que la reabsorción radicular fue mínima. La colocación invertida de los brackets puede ser una alternativa útil en casos seleccionados. No obstante, es necesario un seguimiento a largo plazo para confirmar la estabilidad del tratamiento.

PALABRAS CLAVE: Ortodoncia; Colocación de brackets; Reporte de caso; Torque radicular; Terapia con aparatología fija; Proclinación.

INTRODUCTION

Proclination of the upper incisors is a prevalent orthodontic issue that can compromise facial esthetics, dental function, and periodontal health (1). Such proclination may result from skeletal imbalance, habits like thumb sucking, or even an unfavorable tooth movement during previous treatment (2). The correction of proclined maxillary incisors is often an integral part of comprehensive orthodontic management (3). Achieving ideal inclination and torque of the upper incisors plays a pivotal role in establishing a balanced smile arc, functional anterior guidance, and stable Class I occlusion (4). Conventional approaches for managing proclination typically include torque auxiliaries, customized archwires, extraction of premolars to allow controlled retraction, and in certain cases, the application of skeletal anchorage devices (3, 5, 6). Although effective, these approaches can prolong treatment and sometimes introduce unwanted effects including root resorption or alveolar bone dehiscence (7, 8).

In recent years, innovative methods have been explored to simplify anterior torque control (4, 5). One option that has gained quiet attention is reversing the orientation of brackets on selected teeth (9, 10). When used appropriately, this modification can help redirect root torque without additional auxiliaries or invasive steps (9, 11).

Despite its simplicity, reverse bracket placement remains underreported in clinical literature, and its long-term stability has yet to be fully established (12). Proper case selection is crucial, as the technique is not universally applicable, particularly in cases requiring substantial sagittal corrections or extraction protocols (13, 14). The present case report describes how this approach was integrated into treatment for an adult patient with proclined maxillary incisors. The clinical outcome highlights the potential of this approach to provide efficient torque correction and improved smile esthetics while reducing the need for adjunctive mechanics.

CASE REPORT

DIAGNOSIS AND ETIOLOGY

A 21-year-old female presented to the orthodontic clinic with chief complaints of a midline diastema between the maxillary central incisors, proclination of the upper incisors, and a missing upper left molar. Extraoral assessment indicated a straight facial profile with competent lips and satisfactory lip contact at rest (Figure 1.A-C). Intraoral examination showed a full complement of permanent teeth, bilateral Class I canine relationships, a Class I molar relationship on the right side, and an undefined molar relationship on the left due to the absence of the upper first molar (Figure 1.D-H). The facial midline aligned with the maxillary and mandibular dental midlines. Overjet was increased to 4.5 mm, and overbite was within normal limits at 1.8 mm. A 2 mm diastema was present between the maxillary central incisors.

Figure 1. Extraoral (A-C) and intraoral (D–H) photographs taken before orthodontic treatment.

Panoramic radiography revealed no evidence of periodontal or periapical pathology, and complete eruption of all third molars was observed (Figure 2. A). Lateral cephalometric analysis demonstrated a skeletal Class I relationship (Wits appraisal: –1.6 mm; ANB: 2.94°) (Figures 2B, 2C; Table 1). Growth pattern assessment indicated a normodivergent skeletal type (FMA: 26.34°). The upper incisors exhibited proclination (U1 to maxillary plane: 126.31°), whereas the lower incisors showed normal angulation (IMPA: 90.39°). Both lips were in normal position relative to the E-line (upper lip: 0.32 mm; lower lip: 1.9 mm). Additional cephalometric parameters are summarized in Table 1.

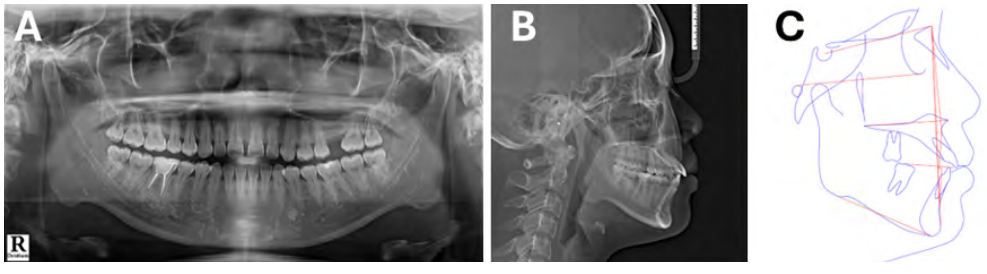

Figure 2. Pre-treatment panoramic (A), lateral cephalometric (B) radiographs, and tracing (C).

Table 1. Cephalometric measurements.

Measurement	Normal value	Pretreatment	Posttreatment
SNA (0)	82	80.98	81.52
SNB (0)	80	78.04	78.8
ANB (0)	2	2.94	2.72
Wits appraisal (mm)	-1	-1.6	-1.41
Maxillary mandibular plane angle (0)	23	26.77	26.25
FMA (0)	25	26.34	26.53
U1 to maxillary plane angle (0)	116	126.31	115.67
U1 to A-Pog (mm)	3	5.21	3.83
IMPA (0)	90	90.39	88.01
L1 to A-Pog (mm)	1	3.62	2.12
Upper lip to E-plane (mm)	-2	0.32	-0.28
Lower lip to E-plane (mm)	0	1.9	1.16

SNA= Stella, Nasion, A point; SNB= Stella, Nasion, B point; ANB= A point, Nasion, B point; Wits appraisal: the projections of A point and B point on the occlusal plane. FMA= Frankfort Mandibular Plane Angle; IMPA= Incisor Mandibular Plane Angle. Analysis performed using the WebCeph digital cephalometric platform.

TREATMENT OBJECTIVES

The main objectives of treatment were to achieve proper alignment and leveling of the dentition, close the midline diastema between the maxillary central incisors, and correct the proclination of the upper incisors. Additionally, the treatment sought to create sufficient space for a dental implant at tooth #26, establish optimal occlusion, and enhance both facial and smile aesthetics.

TREATMENT PROGRESS

The teeth were bonded using standard 0.022 × 0.025-inch slot brackets (MBT prescription), with the brackets on the four upper incisors rotated 180° to enhance labial root torque. Sequential superelastic nickel-titanium (Ni-Ti) archwires were employed for initial leveling and alignment: 0.012-, 0.014-, 0.016-, 0.016 × 0.022-, and 0.017 × 0.025-inch. Each archwire was maintained for 4 weeks during this phase. Following alignment, a 0.017 × 0.025-inch stainless steel (SS) archwire was installed in the upper arch, incorporating a NiTi open-coil spring to gain space for the dental implant at tooth #26. The diastema in the upper arch was closed with power chains, and a frenectomy was performed during the orthodontic treatment.

After implant placement, final alignment of the maxillary arch was accomplished with a 0.019 × 0.025-inch SS wire, bypassing the implant site. The 0.019 × 0.025-inch rectangular archwire was maintained in the upper arch for an additional six weeks to achieve optimal labial root torque, particularly on the four upper incisors, thereby correcting their proclination and establishing proper inclination. The final occlusal settling was achieved using 3/16-inch, 3.5 oz box elastics in conjunction with a 0.016-inch NiTi archwire in the maxillary arch and a 0.016 × 0.016-inch NiTi archwire in the mandibular arch (Figure 3. A-E). Upon completion of treatment, the orthodontic brackets were debonded, and fixed retainers were placed to both the upper and lower dental arches.

TREATMENT RESULTS

The treatment spanned twenty-five months, successfully meeting all treatment objectives. By the end of treatment, the patient exhibited normal overbite and overjet, with canines and molars in Class I relationship. The maxillary and mandibular midlines were coincident with each other and matched the facial midline. The diastema was closed, and smile esthetics were notably enhanced (Figure 4). The post-treatment panoramic radiograph revealed no periapical or periodontal lesions, and minimal root resorption was observed based on root morphology and apical contour (Figure 5.A). Lateral cephalometric analysis demonstrated no clinically significant skeletal changes, with ANB changing from 2.94° to 2.72°, Wits appraisal from –1.6 mm to –1.41 mm, and FMA from 26.34° to 26.53° (Figure 5. B-C, Table 1). Dental analysis indicated improved inclination and position of the previously retroclined upper incisors (U1 to maxillary plane from 126.31° to 115.67°, U1 to A-Pog from 5.21 mm to 3.83 mm). The lower incisors demonstrated normal inclination post-treatment, despite a slight decrease in IMPA (from 90.39° to 88.01°), with improved positioning (L1 to A-Pog from 3.62 mm to 2.12 mm).

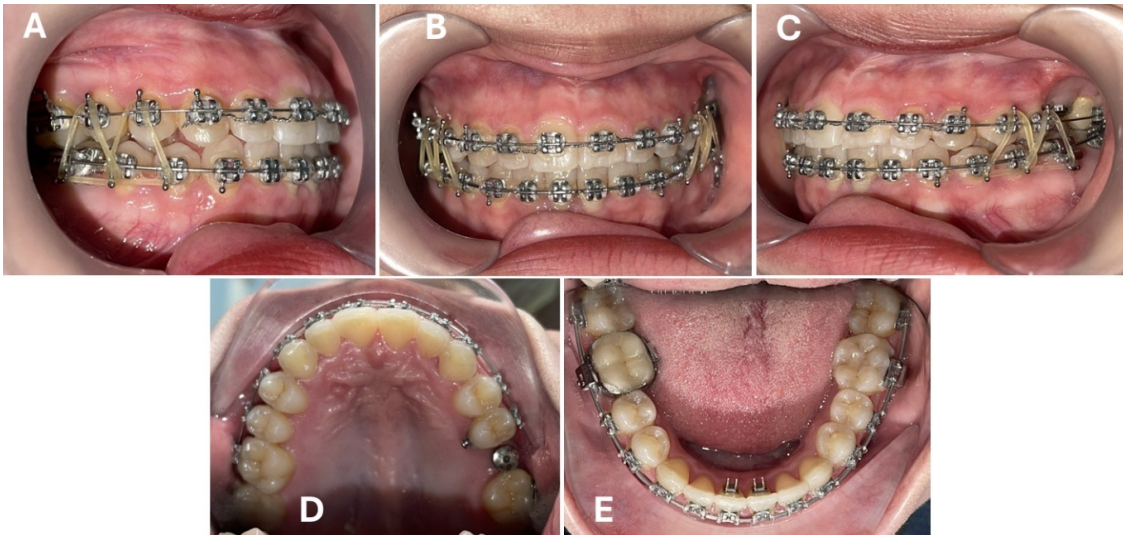

Figure 3. Intraoral photographs captured during orthodontic treatment (A-E).

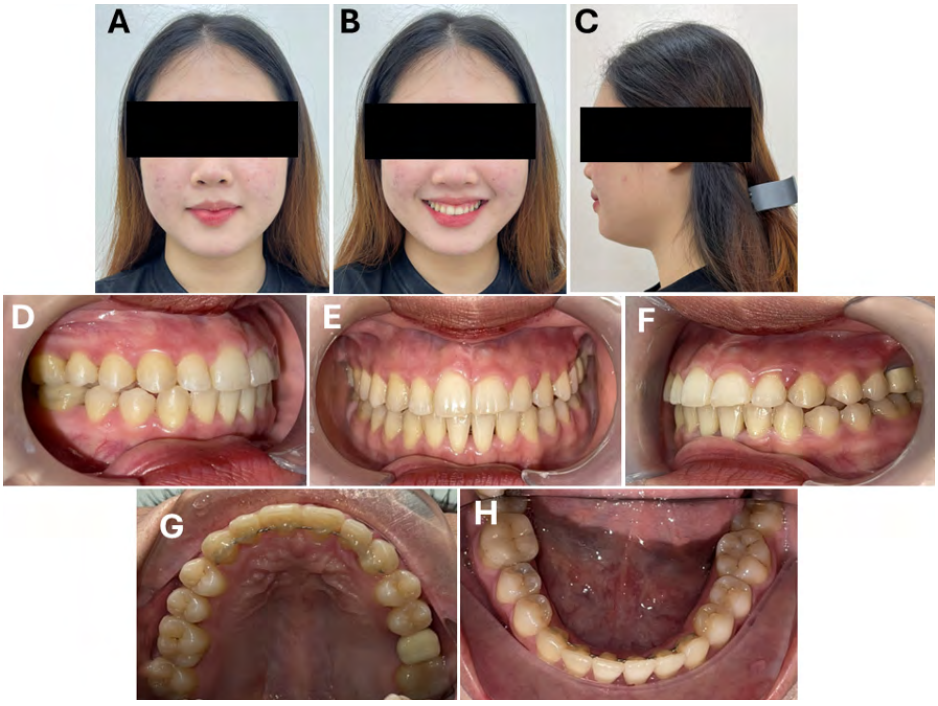

Figure 4. Post-treatment extraoral (A–C) and intraoral (D–H) photographs.

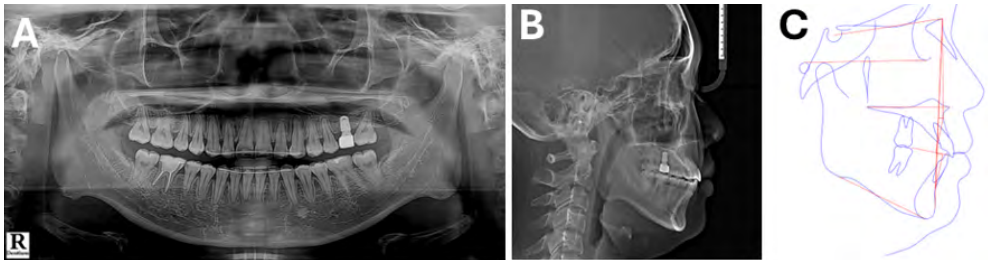

Figure 5. Post-treatment panoramic (A) and lateral cephalometric (B) radiographs, and tracing (C).

DISCUSSION

The present case illustrates the successful management of proclined maxillary incisors using reverse bracket placement, a simple yet effective modification to conventional fixed appliance therapy. This approach allowed controlled torque correction without relying on complex auxiliary mechanics, additional anchorage, or extraction strategies, which are often considered in similar clinical scenarios (13-15).

The maxillary incisors play an essential role in the appearance of the smile and in maintaining proper anterior guidance, so their position must be carefully managed throughout treatment (16). Conventional brackets, even when properly positioned, may exhibit variations in torque expression due to slot dimension, wire play, and individual anatomical factors (4). In this case, reverse bracket placement served as a biomechanically advantageous method to increase labial root torque without the need for customized appliances.

One of the key biomechanical advantages of reverse bracket placement is its ability to modify torque expression in a predictable manner (11, 17). By inverting the brackets on the maxillary incisors,

the torque prescription was effectively reversed, facilitating labial root movement and reducing the excessive proclination observed at the start of treatment. This is consistent with previous reports emphasizing that bracket inversion can be a practical alternative to enhance torque control in selected cases (9, 11).

Cephalometric evaluation after treatment confirmed that the majority of the improvement occurred at the dentoalveolar level rather than through skeletal modification. The significant improvement in the inclination of the maxillary incisors contributed to a more harmonious facial profile, while achieving normal overjet and overbite. The lower incisors exhibited only minor changes, remaining within a clinically acceptable range (Table 1). From a clinical perspective, this technique offers several advantages. It simplifies torque management in localized anterior malpositions, reduces the need for custom archwire adjustments, and minimizes treatment invasiveness (12). In this case, no significant root resorption or periodontal compromise was observed radiographically at the end of the 25-month treatment period, supporting previous findings that controlled torque mechanics do not increase the risk of iatrogenic root resorption (2). However, this approach should be avoided in extraction cases where significant retraction of upper incisors is required, because it could result in excessive retroclination and compromise the supporting alveolar bone.

Certain limitations must be considered. First, reverse bracket placement is highly case-dependent and may not be suitable for patients with severe skeletal discrepancies, crowding requiring extractions, or those necessitating substantial sagittal corrections (3, 18). Second, long-term stability of the corrected inclination remains a concern. Retention protocols, including bonded retainers, are therefore essential to preserve treatment results.

Further studies with larger patient samples would be helpful to better understand how well this method performs over time and to compare it with other torque control strategies such as bidimensional systems, torque auxiliaries, or customized bracket prescriptions (5, 6). In addition, long-term follow-up studies will be crucial to determine the stability of the results at 5-10 years post-treatment.

CONCLUSION

Reverse bracket placement effectively corrected proclined maxillary incisors with minimal invasiveness and without the need for complex auxiliaries. This approach helped achieve proper inclination of the upper incisors and improved smile esthetics, with negligible root resorption observed. Its use should be limited to appropriate cases, and longer follow-up from larger groups of patients would help clarify how stable these results remain over time.

AUTHOR CONTRIBUTION STATEMENT: Study design was conceived by C.T.B.V. Data acquisition, analysis, and interpretation were performed by C.T.B.V. C.T.B.V. also drafted and revised the manuscript.

PATIENT CONSENT STATEMENT: The authors confirm that informed consent was obtained from the patient. The consent form permits the use of clinical information and photographs for publication. The patient was informed that all identifying information, including name and initials, would remain confidential, and appropriate measures were taken to protect her privacy.

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