

CASE REPORT

Orthodontic Management of a Transposed Maxillary Canine and Lateral Incisor

MARIANA DE AGUIAR BULHÕES GALVÃO, DDS, MS
ALINE CAMPOS CABRAL, DDS
CLARICE NISHIO, DDS, MS
JONAS CAPELLI JÚNIOR, DDS, MS

Canines are most frequently transposed with first premolars, and less often with lateral incisors.¹⁻⁹ Such transposition, which usually occurs in the maxillary arch,^{2,4,7} is most commonly unilateral,^{5,8} with the left side affected more often than the right.^{1,5} In complete transposition, both the crowns and the roots of the transposed teeth are parallel. In incomplete transposition, the crowns of the teeth overlap, but the root apices are in relatively normal positions.^{3,6}

The etiology of canine transposition is still widely debated.

Contributing factors may include genetics²; dental anomalies, such as missing or undersize lateral incisors, missing second premolars, or retained deciduous canines⁵; and trauma to the deciduous dentition.⁸

This article describes the treatment of a young patient with complete transposition of a maxillary canine and lateral incisor.

Diagnosis and Treatment Plan

An 11-year-old male presented with a Class I molar mal-

occlusion (Fig. 1). His maxillary midline was shifted 1mm to the left in relation to the facial midline, and he had arch-length deficits of 3mm in the maxillary arch and 2mm in the mandibular arch. Clinical examination showed a mild curve of Spee and a good profile. Panoramic and periapical radiographs revealed a complete transposition of the maxillary left canine and left lateral incisor.

The treatment objectives were to improve the patient's appearance while maintaining the facial profile, Class I molar relationship, and mild curve of Spee,

Dr. Galvão is in the private practice of orthodontics in São Paulo, and Drs. Cabral and Nishio in Rio de Janeiro, Brazil. Dr. Capelli Júnior is a Professor, Department of Orthodontics, Rio de Janeiro State University, Rio de Janeiro, Brazil. Contact Dr. Galvão at Rua Independência, N. 540, Apt. 112, Jardim Bela Vista, Santo André, SP 09041-310, Brazil; e-mail: marianaortodontista@superig.com.br.



Dr. Galvão



Dr. Cabral



Dr. Nishio



Dr. Capelli Júnior

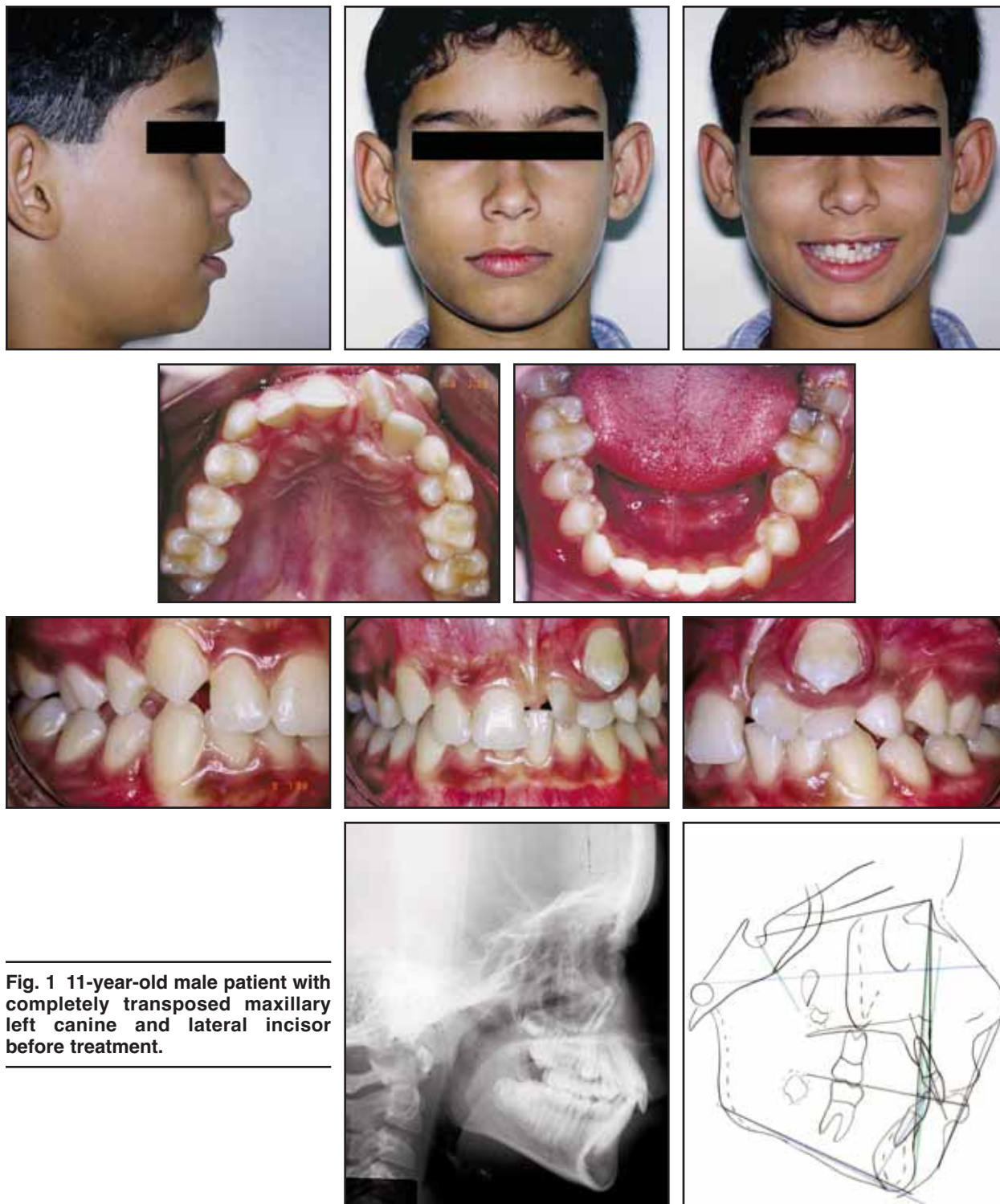


Fig. 1 11-year-old male patient with completely transposed maxillary left canine and lateral incisor before treatment.

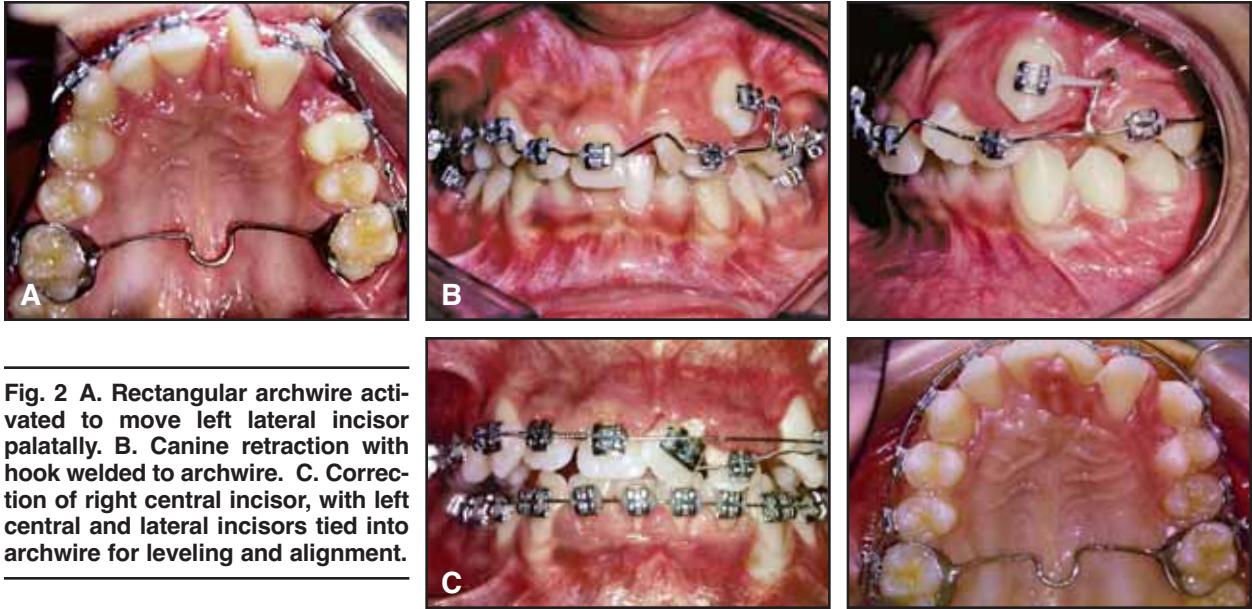


Fig. 2 A. Rectangular archwire activated to move left lateral incisor palatally. B. Canine retraction with hook welded to archwire. C. Correction of right central incisor, with left central and lateral incisors tied into archwire for leveling and alignment.

and to resolve the anterior occlusion, aligning the canine and lateral incisor in their normal positions with parallel roots.

Treatment Progress

Standard edgewise .022" × .028" brackets were bonded, and a palatal arch was placed to avoid loss of anchorage during treatment. An .019" × .025" stainless steel maxillary archwire was activated only to move the left lateral incisor palatally (Fig. 2A). This allowed the canine to be moved distally, away from the lateral incisor root, with a hook welded to the archwire (Fig. 2B). A fixed appliance was then placed in the lower arch, which was treated conventionally with a series of leveling and alignment archwires.

After canine retraction, the hook was removed, and correction

of the right central incisor was begun (Fig. 2C). The upper left central and lateral incisors were tied into the archwire for leveling and alignment. A rectangular archwire with a teardrop loop was used to close the remaining space.

Treatment Results

The patient's overall appearance was improved, while the profile was maintained (Fig. 3). The molar relationship was preserved, a Class I canine relationship was achieved, and the overjet and overbite were corrected, along with the maxillary midline. The transposed canine and lateral incisor were properly aligned, with parallel roots.

Discussion

In cases of tooth transposi-

tion, treatment options include extraction of one of the transposed teeth, alignment of the teeth in the transposed positions,^{3,4,7,8} and orthodontic relocation of the teeth to their normal positions.^{4,6,10,12} If the teeth are aligned in their transposed positions, the incisors can be recontoured with composite.^{3,4} Movement of the transposed teeth into their normal positions provides a better esthetic result, however, if the case allows. Treatment planning must include an assessment of the positions of the root apices and the amount of bone available at the relocation sites.¹¹ Other factors to consider are esthetics, periodontal support,⁹ the anticipated occlusal relationship, and the level of patient cooperation that can be expected during a lengthy treatment.^{4,6,10}

In the case shown here, the use of light, controlled forces over

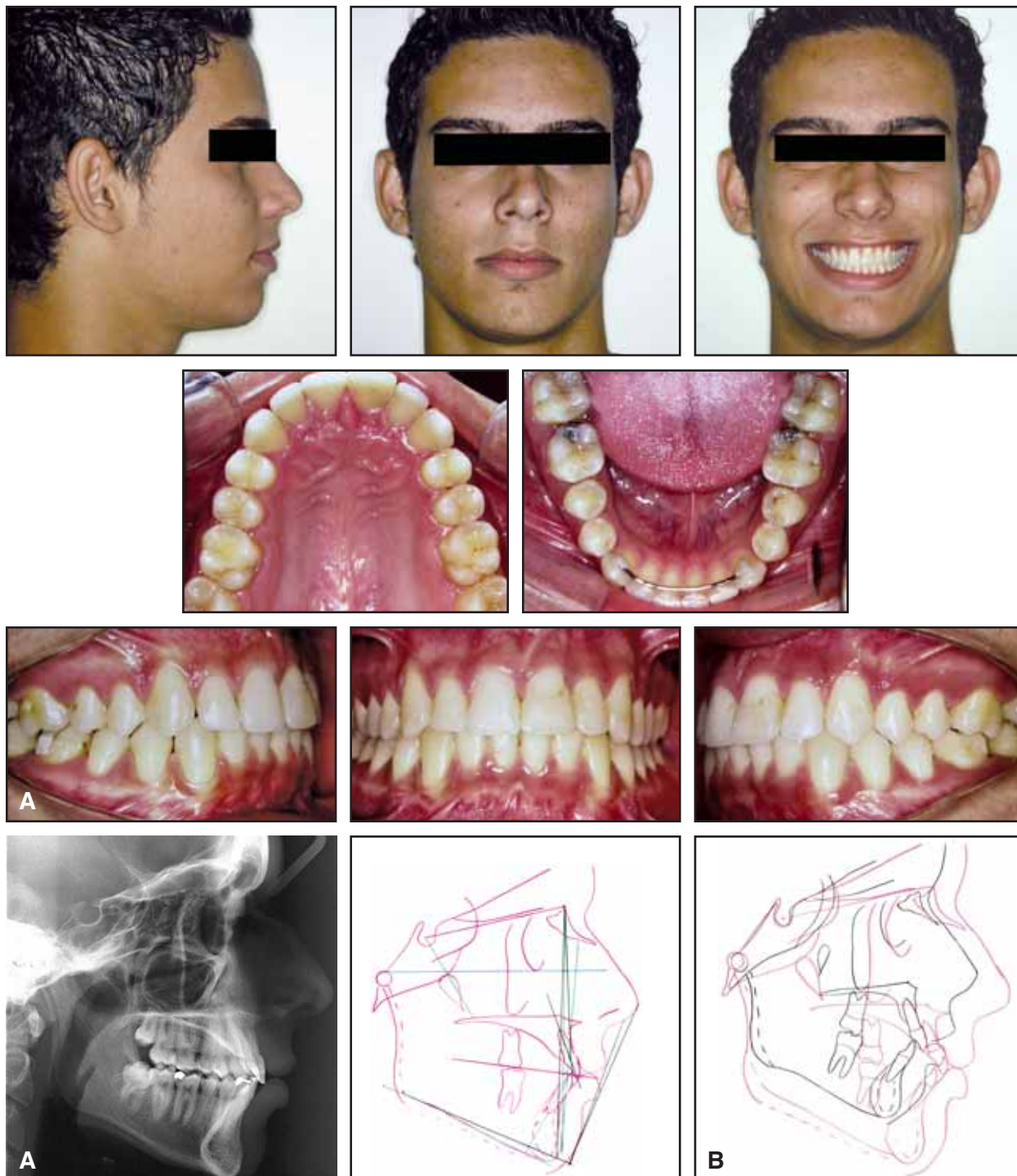


Fig. 3 A. Patient after five years of treatment. B. Superimposition of pre- and post-treatment cephalometric tracings.

a long period of time produced an esthetic gingival contour in the canine region while improving the occlusal relationship. Although this can be an effective approach to treatment of maxillary canine and lateral incisor transposition, the procedure is challenging, requiring considerable care to prevent damage to the teeth and supporting structures.

REFERENCES

1. Peck, L.; Peck, S.; and Attia, Y.: Maxillary canine-first premolar transposition, associated dental anomalies and genetic basis, *Angle Orthod.* 63:99-109, 1993.
2. Peck, S.; Peck, L.; and Kataja, M.: Mandibular lateral incisor-canine transposition, concomitant dental anomalies, and genetic control, *Angle Orthod.* 68:455-466, 1998.
3. Shapira, Y. and Kufnec, M.M.: Orthodontic management of mandibular canine-incisor transposition, *Am. J. Orthod.* 83:271-276, 1983.
4. Shapira, Y.; Kufnec, M.M.; and Stom, D.: Maxillary canine-lateral incisor transposition—Orthodontic management, *Am. J. Orthod.* 95:439-444, 1989.
5. Shapira, Y. and Kufnec, M.M.: Maxillary tooth transpositions: Characteristic features and accompanying dental anomalies, *Am. J. Orthod.* 119:127-134, 2001.
6. Shapira, Y. and Kufnec, M.M.: A unique treatment approach for maxillary canine-lateral incisor transposition, *Am. J. Orthod.* 119:540-545, 2001.
7. Kreia, T.B. and Tanaka, O.: Transposição dentária, *Rev. Dent. Press Ortod. Ortop. Facial* 9:129-136, 2004.
8. Peck, S. and Peck, L.: Classification of maxillary tooth transpositions, *Am. J. Orthod.* 107:505-517, 1995.
9. Sato, K.; Yokozeki, M.; Takagi, T.; and Moriyama, K.: An orthodontic case of transposition of the upper right canine and first premolar, *Angle Orthod.* 72:275-278, 2002.
10. Schott, K. and Capelli Jr., J.: Transposição de canino superior com incisivo lateral: Relato de caso e revisão da literatura, *Rev. Bras. Odont.* 54:359-361, 1997.
11. Parker, W.S.: Transposed premolars, canines, and lateral incisors, *Am. J. Orthod.* 97:431-448, 1990.
12. Mucha, J.N.: Transposição de canino e primeiro pré-molar com ausência congênita de incisivos laterais superiores—Conduta ortodôntica, *Rev. Soc. Bras. Ortod.* 1:54-61, 1989.