Case Report BC

Early identification and correction of transposed teeth

The early identification of transposed teeth often simplifies orthodontic correction. In this Case Report, BC's mandibular right canine appeared to be developing in transposition with the right lateral incisor. Treatment included correction of the transposition in the mixed dentition as well as resolution of the arch length deficiency in the permanent dentition.

By Daniel M. Yaillen, DMD, MSD

Ectopic eruption of teeth is routinely encountered by the clinical orthodontist. Less common, however, is a special type of ectopic eruption known as transposition, the exchange in position of two, usually adjacent, teeth. A review of recent literature indicates that the maxillary permanent canine and first premolar may be the most frequently occurring transpositions, and can even occur bilaterally.[1] Only one case has been reported involving transposition of an adjacent mandibular permanent canine and lateral incisor,[2] although there are cases involving misplacement of a mandibular canine across the midline.[3,4] All cases previously presented in the literature are observational in nature, and have not considered treatment.

Case Report

The patient presented for orthodontic evaluation because of crowding evident in the deciduous and mixed dentition, combined with the mother's history of dental arch length deficiency. At 7 years, 7 months of age the patient had a Class I skeletal pattern, tending toward Class II. The canine relationship was Class I while the molar relationship in the mixed dentition was end-to-end. Mild arch length deficiency was evident with eruption of the permanent central incisors, but more significant was the gingival enlargement lingual to the mandibular deciduous canines near the floor of the mouth. Panoramic radiographic evaluation confirmed the distal eruption of the mandibular permanent lateral incisors, as well as additional arch length deficiency. A lateral cephalometric radiograph showed a lingual eruption pattern of the mandibular permanent lateral incisors.

Interceptive orthodontic treatment was recommended, but due to personal reasons the patient was lost from the practice until the age 8 years 8 months. At this time the maxillary and mandibular permanent lateral incisors were erupting and the right lateral incisor had erupted distal to the deciduous canine. The mandibular right permanent lateral incisor was therefore transposed with the right deciduous canine and had exfoliated the deciduous first molar upon its eruption. The mandibular dental midline had

Figure 1A & B Pretreatment photographs at 7 years 7 months.

Figure 1A

Figure 1B

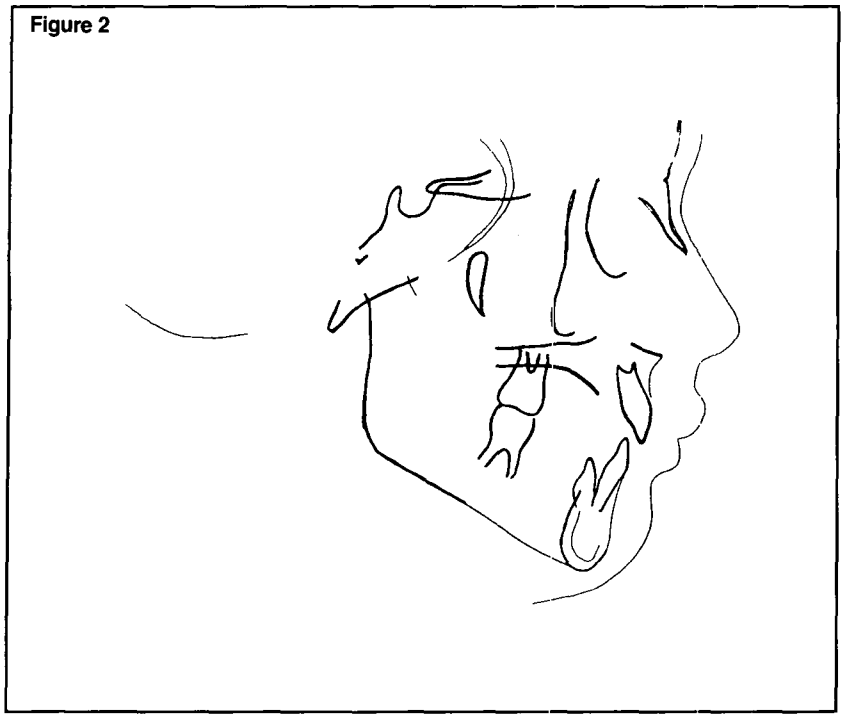

Figure 2
Pretreatment cephalometric tracing at 7 years 7 months.

Figure 3A & B
Early mixed dentition stage of eruption showing lateral incisors erupting distally to the lingual of the deciduous canines.

Figure 4
By 8 years 8 months the mandibular right lateral incisor had erupted distal to the deciduous canine. The roots of the deciduous first molar were resorbed and the tooth was exfoliated.

Figure 5
Evidence of crowding in the maxillary arch.

Figure 6
During the initial phase of treatment, a lingual arch was placed to initiate correction. Two months later, brackets were placed on the incisors.

deviated one millimeter to the right of the maxillary dental and facial midlines. The maxillary left permanent lateral incisor had erupted into lingual crossbite with the mandibular left deciduous canine.

Treatment options

1. No orthodontic treatment. Although orthodontic treatment is an elective procedure, in this case it was felt that the potential benefits of interceptive treatment were overwhelming.
2. Maintenance of the transposition. The arch length deficiency and resultant crowding in the mandibular right quadrant would necessitate extraction of permanent teeth to resolve the crowding while minimizing the potential risk of root resorption. Extraction of the ectopic mandibular right lateral incisor as well as the first premolars in the other three quadrants could be considered. Functionally, the mandibular right permanent canine would replace the lateral incisor, and the mandibular right first premolar could be positioned in the canine position. Equilibration would provide adequate posterior disocclusion in protrusive and lateral excursions.
3. Correction of the transposition. Clinical history and evaluation as well as radiographic evidence indicated a lingual, ectopic path of eruption for the transposed lateral incisors. The patient's youth and therefore low alveolar canine position combined with normal labial eruption of the permanent canine would

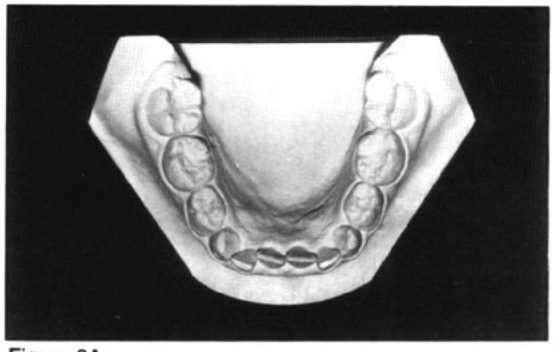
Figure 3A

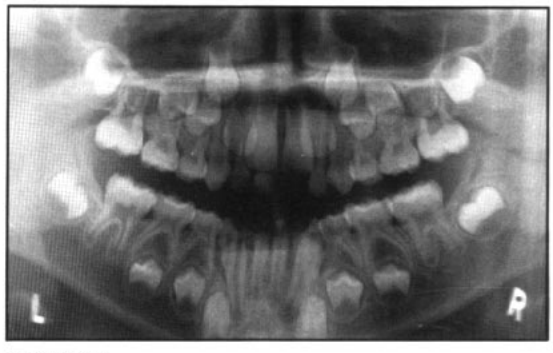

Figure 3B


Figure 4

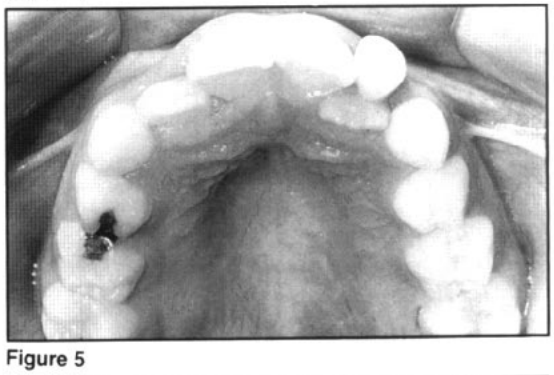
Figure 5

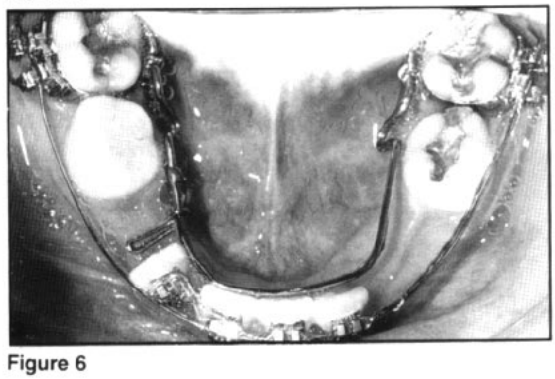
Figure 6

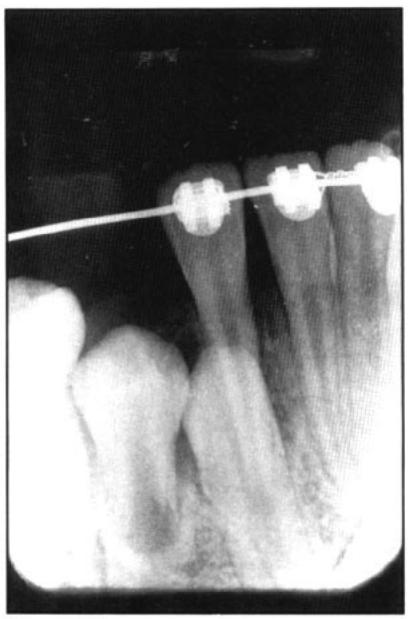

Figure 7A

Figure 7B

Figure 8

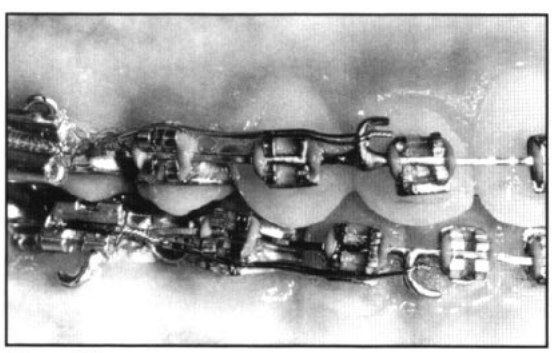

Figure 9A

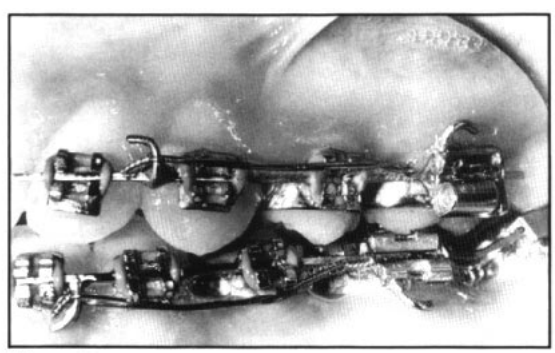

Figure 9B

Figure 7A & B
Over a period of nine months as incisors were aligned, the relationship of the erupting canine improved. The first premolars were eventually extracted.

Figure 8
Following alignment of the canines, additional treatment was delayed until all remaining teeth erupted.

Figure 9A & B
Comprehensive orthodontic treatment was resumed at 12 years 10 months with fixed appliances.

allow a potential path for correction of the transposition. Resolution of the overall arch length deficiency and related occlusal discrepancies would likely require extraction of four premolars, but the end result would be a more normal functional occlusion.

Treatment

Due to the potential advantages of correcting the transposition, it was decided to initiate interceptive orthodontic care. Root resorption was still a concern. The mandibular left deciduous first molar and left and right deciduous canines were extracted and a mandibular lingual arch (with fingerspring to the ectopic right lateral incisor) was placed. A maxillary transpalatal arch was placed to maintain arch length during the mixed dentition. Two months later, brackets were bonded to the permanent mandibular incisors and they were aligned.

The mandibular right permanent first premolar erupted early, and little space was present for the unerupted canine. Periapical radiographs indicated no evidence of root resorption on any permanent teeth, and it was decided to extract the mandibular right permanent first premolar. Extraction of the remaining first premolars was accomplished following their later eruption. Upon the eruption of the remaining permanent teeth at age 12 years, 10 months, full orthodontic appliances were placed and treatment progressed in a routine fashion. The only exception being that there were many missed appointments and broken appliances.

Appliances were removed and final records gathered at 15 years, 2 months of age. A satisfactory esthetic and functional occlusion was obtained. Mandibular incisors were retained with a lingually bonded lateral-to-lateral retainer and a removable maxillary circumferential retainer was placed. The final panoramic radiograph indicated good root parallelism with no evidence of resorption. A two-year posttreat-

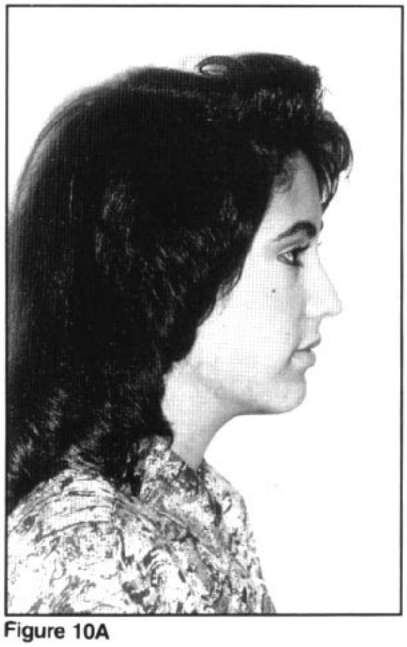

Figure 10A

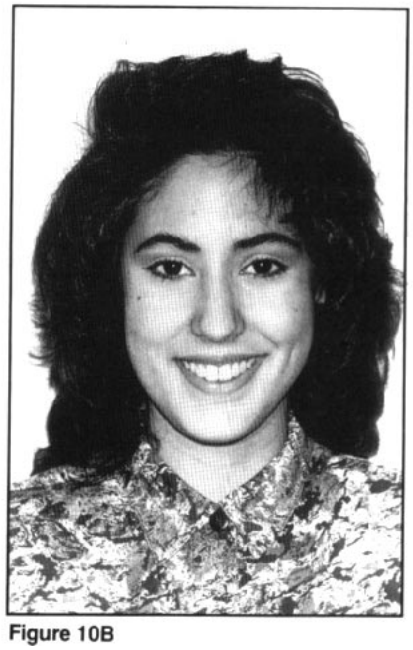

Figure 10B

Figure 10A & B
Posttreatment photographs at 15 years 3 months.

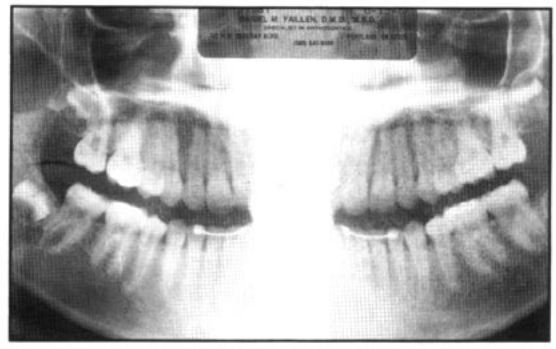

Figure 11

Figure 11
Posttreatment panoramic radiograph.

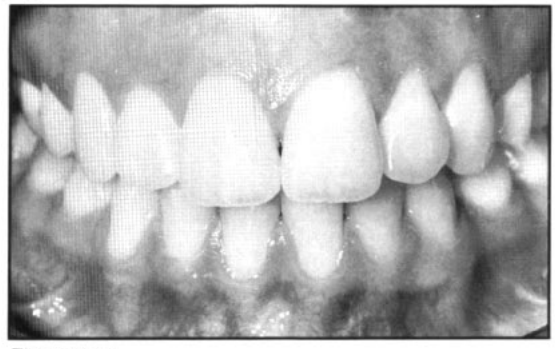

Figure 12A

Figure 12A, B & C
Posttreatment intraoral photographs.

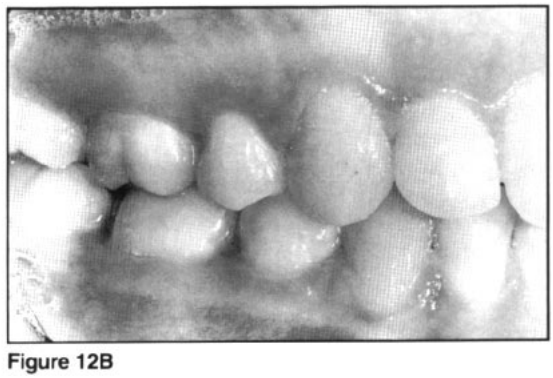

Figure 12B

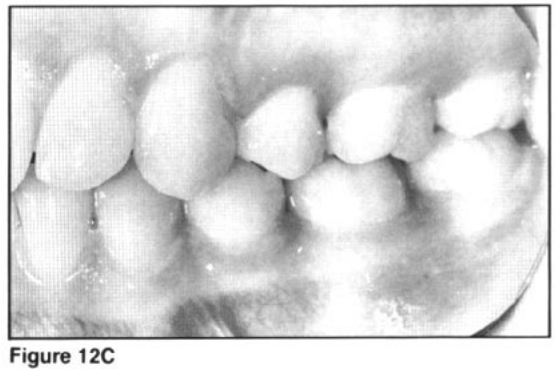

Figure 12C

ment evaluation following completion of maxillary retention indicated little occlusal change.

Summary

In this case, correction of a transposition involving the mandibular right lateral incisor and canine was accomplished, followed by definitive orthodontic correction in the permanent dentition. No adverse response to treatment was evident, and the patient was able to obtain a satisfactory occlusal, functional and stable result.

Author's Address
Daniel M. Yaillen, DMD, MSD
742 N.W. Murray Blvd.
Portland, OR 97229

References

1. Ruprecht, A., Sastry, K., and Batniji, S.: Transposition of teeth. Can. Dent. Assoc., 50(4):308-9, 1984.
2. Al-Shawaf, M.: Bilateral asymmetrical transposition of teeth. Report of case. Ann. Dent., 47(1):41-2, 1988.
3. Broadway, R.: A misplaced mandibular permanent canine. Br. Dent. J., 163(11):357-8.
4. Abbott, D., Svirsky, J. and Yarborough, B.: Transposition of the permanent mandibular canine. Oral Surg., 49(1):97, 1980.

Figure 13
Cephalometric tracing at 15 years 3 months.

Figure 14A, B, C & D
Posttreatment study casts.

Figure 13

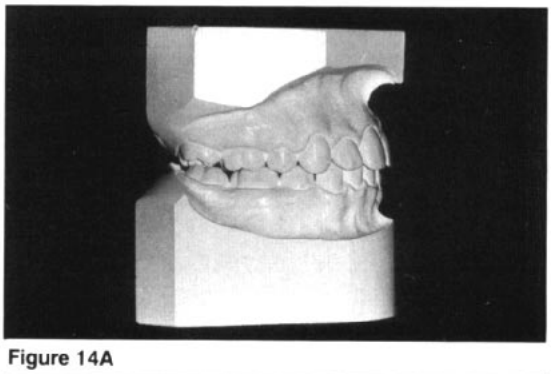

Figure 14A

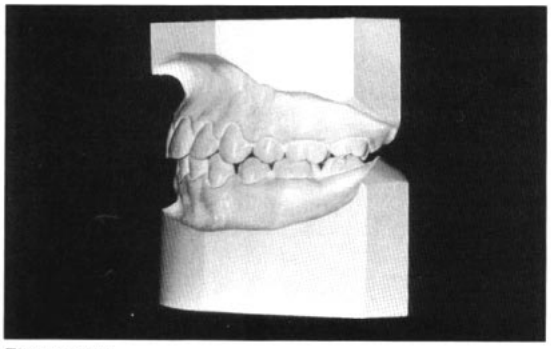

Figure 14B

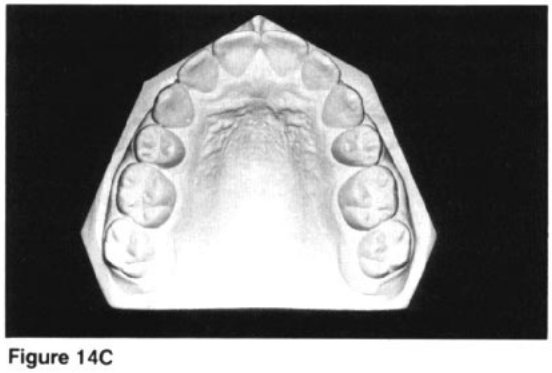

Figure 14C

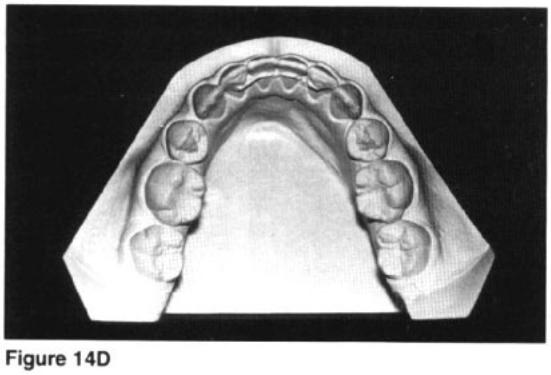

Figure 14D