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ORTHODONTIC MANAGEMENT OF A PATIENT WITH IMPACTED AND TRANSPOSED MANDIBULAR CANINES

This patient report describes the treatment of a 10-year-old female with complete transposition of her impacted mandibular canines and lateral incisors. The patient had a Class I occlusion, and her mandibular lateral incisors were in crossbite with the maxillary central incisors. The treatment objectives were to create space for the impacted canines and align them with the incisors, one of which was extracted. After treatment, the appearance of the patient's teeth was improved, the occlusion was preserved, and overjet and overbite were corrected. World J Orthod 2009;10:345–349.

Key words: *ectopic eruption, impacted mandibular canines, impaction, transposed mandibular canines*

An ectopic position of a (permanent) tooth bud can lead to ectopic eruption. It occurs most often in the maxillary first molars and mandibular incisors.[1,2] Ectopic eruption of mandibular lateral incisors may lead to transposition of them and the canines. Due to an incorrect path of eruption or lack of space, eruption of the canines is frequently impeded, oftentimes resulting in impaction. Even when there is adequate space, canines can erupt ectopically and become transposed with a premolar or lateral incisor.[3]

This article describes the treatment of a young patient who had impacted mandibular canines that transposed with her lateral incisors.

DIAGNOSIS AND TREATMENT PLAN

A 10-year-old female presented with a convex profile but good facial proportions. Clinical examination showed a Class I occlusion with a crossbite of her mandibular lateral incisors with the maxillary central incisors (Fig 1). Her mandibular canines were absent and her mandibular right primary second molar was still present.

The panoramic radiograph revealed a complete transposition of the mandibular lateral incisors and impacted canines. The cephalogram showed a skeletal Class II (ANB = 5 degrees) with protruded mandibular incisors and a convex profile (Fig 2).

The treatment objectives were to improve the patient's dental appearance by creating space for the mandibular canines and aligning them with the incisors.

Treatment progress

The 0.022 × 0.028-inch Roth prescription brackets were bonded, and a lingual arch appliance was inserted in the mandibular arch to maintain enough space to correct the rotation of the left second premolar and allow the eruption of the right second premolar. After this tooth (which was peg-shaped) had erupted, the lingual arch appliance was removed. The treatment plan for the

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Fig 1 **(a to c)** A 10-year-old girl prior to treatment exhibiting a convex profile but good facial proportions; **(d to f)** mesially tipped mandibular incisors; **(g)** relatively well-aligned maxillary arch; **(h)** and missing mandibular canines, retained mandibular right primary second molar, and rotated mandibular left second premolar.

maxillary arch foresaw conventional leveling and alignment of all teeth. In the mandibular arch, a 0.016-inch stainless steel archwire with a coil spring between the lateral incisors was used to move these two teeth distally, thus making space for the canines (Fig 3).

When the right canine started to erupt in the lateral incisor position, it became apparent that there was insufficient space proper alignment. Because the patient's mandibular incisors were already protruded, the left lateral incisor was extracted. The lingual arch appliance was preventing the canines' eruption, so it was removed, as well. With adequate space, both canines erupted spontaneously. Nickel-titanium and stainless steel archwires were used to align these two teeth (Fig 4).

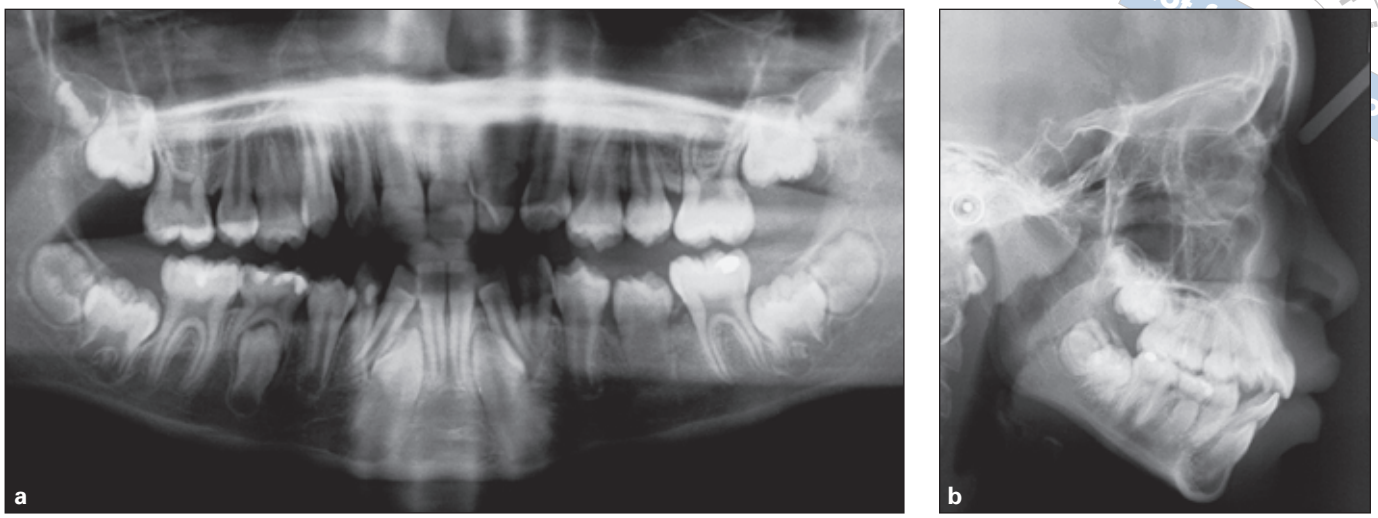

Fig 2 **(a)** Panoramic radiograph revealing a complete transposition of the impacted canines and mandibular lateral incisors. **(b)** Cephalogram before treatment showing a skeletal Class II with protruded mandibular incisors and a convex profile.

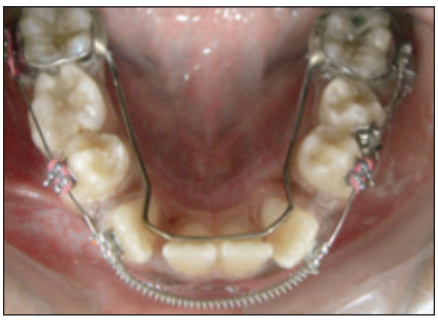

Fig 3 Occlusal view of the mandibular arch with inserted lingual arch appliance for space preservation and distal movement of lateral incisors with an open coil spring.

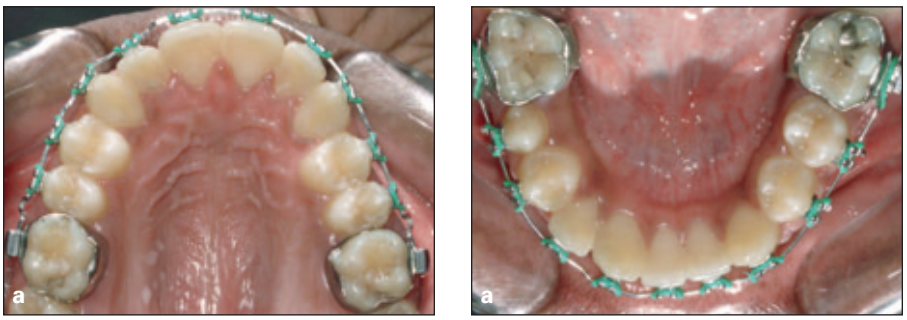

Fig 4 **(a and b)** Occlusal view of both arches toward the completion of treatment; **(b)** with the canines aligned.

In the maxillary arch, some interproximal enamel reduction was performed to solve the Bolton discrepancy created by the extraction of the mandibular left lateral incisor.

Treatment outcome

The patient's dental appearance was improved, and the molar relationship was preserved. In spite of the uniarch extraction, treatment concluded with a correct overjet and overbite; the maxillary midline coincided with the middle of the mandibular right central incisor (Fig 5). The patient's oral hygiene was unfortunately very poor, and multiple demineralizations had established. Radiographs taken at the end of treatment revealed that the roots were parallel, especially in the mandibular anterior area (Fig 6).

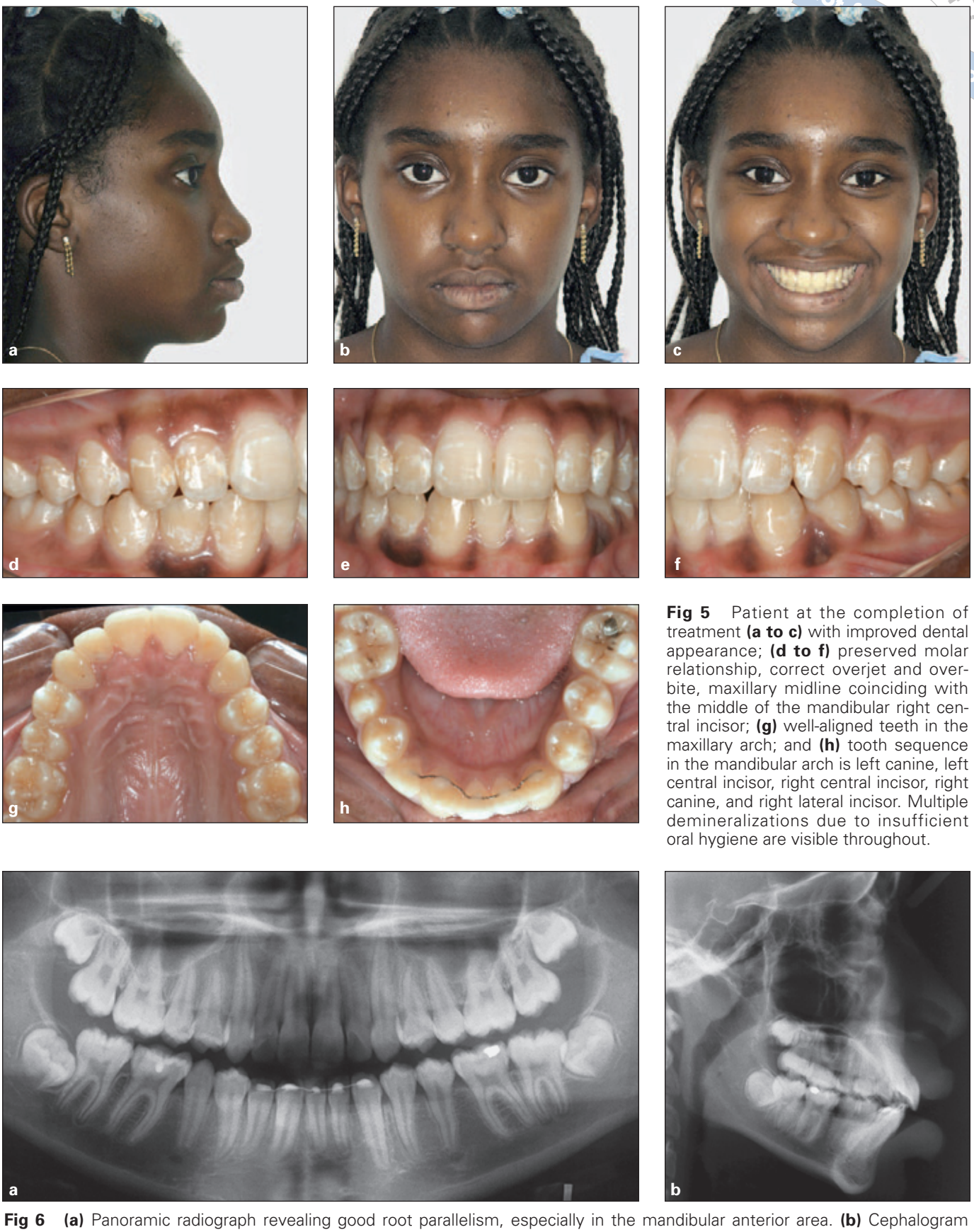

Fig 5 Patient at the completion of treatment **(a to c)** with improved dental appearance; **(d to f)** preserved molar relationship, correct overjet and overbite, maxillary midline coinciding with the middle of the mandibular right central incisor; **(g)** well-aligned teeth in the maxillary arch; and **(h)** tooth sequence in the mandibular arch is left canine, left central incisor, right central incisor, right canine, and right lateral incisor. Multiple demineralizations due to insufficient oral hygiene are visible throughout.

Fig 6 **(a)** Panoramic radiograph revealing good root parallelism, especially in the mandibular anterior area. **(b)** Cephalogram showing an almost identical situation as that at the beginning of therapy.

DISCUSSION

In situations of tooth transpositions, treatment options include extractions, alignment in the transposed position,[4–7] or orthodontic relocation.[5,8–10] When the respective teeth are aligned in their transposed position, they should be recontoured with composite.[4,5] It is often said that moving transposed teeth into their normal position provides a more esthetic result. However, this does not always prove possible or true. Treatment planning must include an assessment of the root apex position, the amount of available bone at the relocation site,[11] esthetics, periodontal support,[12] the anticipated occlusion, and the patient's expected cooperation during a prolonged treatment.[5,8,9]

In the mandible, a transposition would require moving the canine around the lateral incisor, which would lead to bone loss and gingival recession. For the sake of esthetics and safety, it was decided to leave the canine in its transposed position in this patient.

CONCLUSION

This case report shows that a satisfactory result can be obtained by maintaining the transposition and that correction, even when possible, is not always advisable from a cost-benefit viewpoint.

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