

A New Spring for Correction of Maxillary Canine-Premolar Transposition

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The JOB Spring (the acronym is formed from the names of the last three authors of this article) was developed to facilitate correction of partial canine-first premolar transposition in the maxillary arch.¹⁻⁶ This new device helps move the premolar toward the center of the palate to allow mesial displacement of the canine. The spring is attached to the archwire and can be activated either outside or inside the mouth.

Appliance Fabrication and Use

The JOB Spring is fabricated by bending a double open-coil loop into a segment of rectangular .019" × .026" stainless steel wire (Fig. 1). One end of the spring is bent to allow insertion into the slot of the first premolar bracket, and the other end is soldered to the archwire. The spring is activated by opening the anterior leg of the first loop and/or the posterior leg of the second loop with a bird-beak plier, generating a constant moment of force. A stainless steel ligature is used to tie the end of the spring to the slot of the first premolar bracket.

In the case presented here, because the maxillary lateral incisors were extracted, the spring was

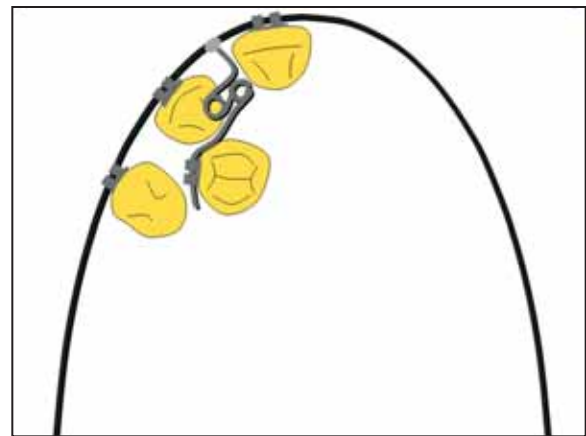


Fig. 1 JOB Spring.

placed on the distal side of the edentulous site. The first premolar bracket was soldered to the distal surface of the orthodontic band, facilitating movement of the tooth toward the center of the palate.

Case Report

A 15-year-old female presented with the

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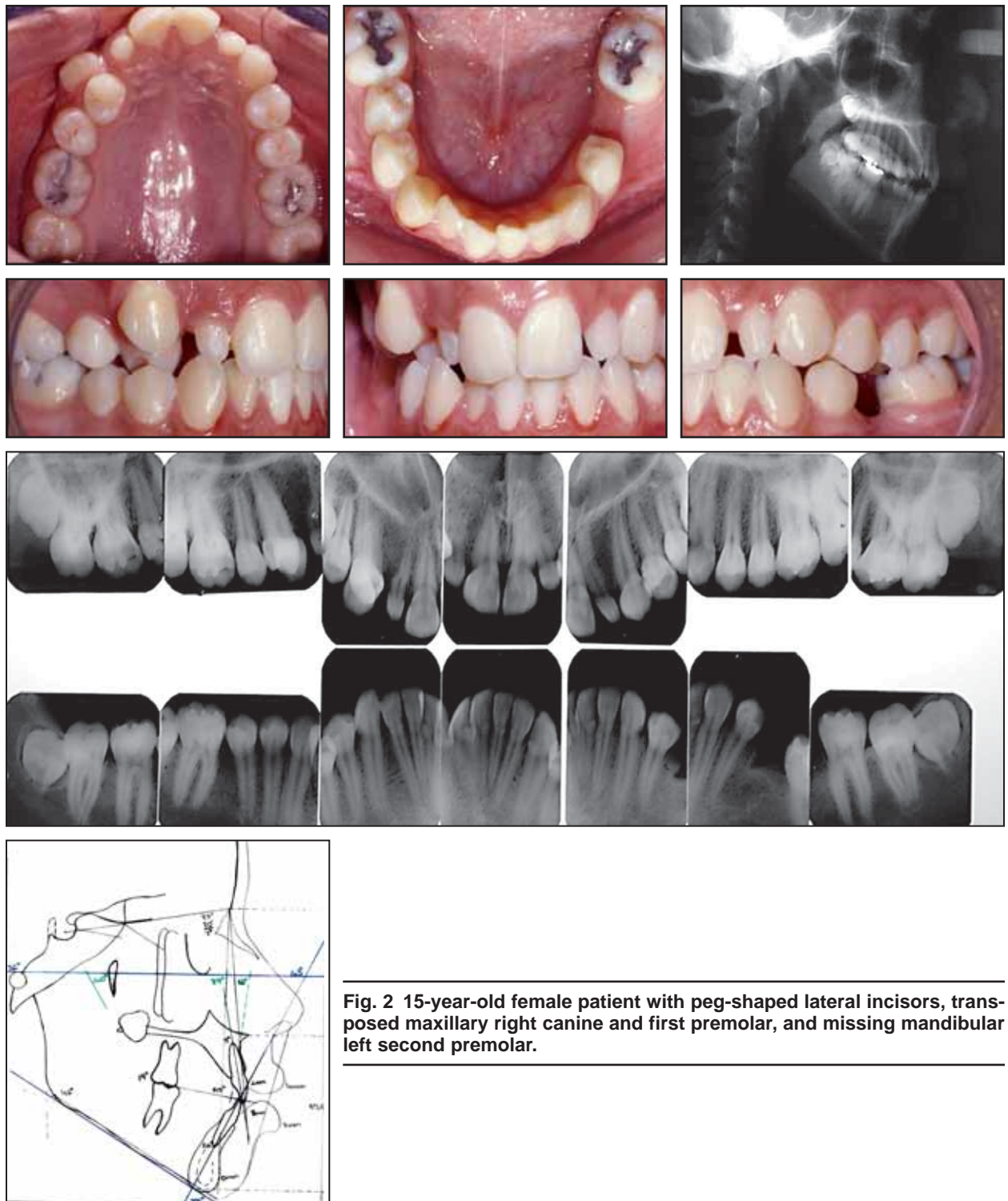


Fig. 2 15-year-old female patient with peg-shaped lateral incisors, transposed maxillary right canine and first premolar, and missing mandibular left second premolar.

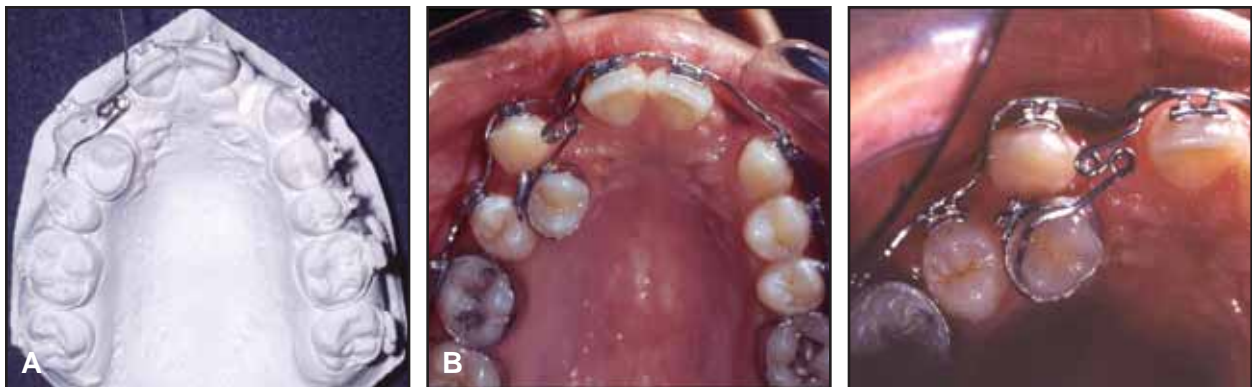


Fig. 3 A. JOB Spring fabricated on plaster cast. B. Clinical placement of spring.

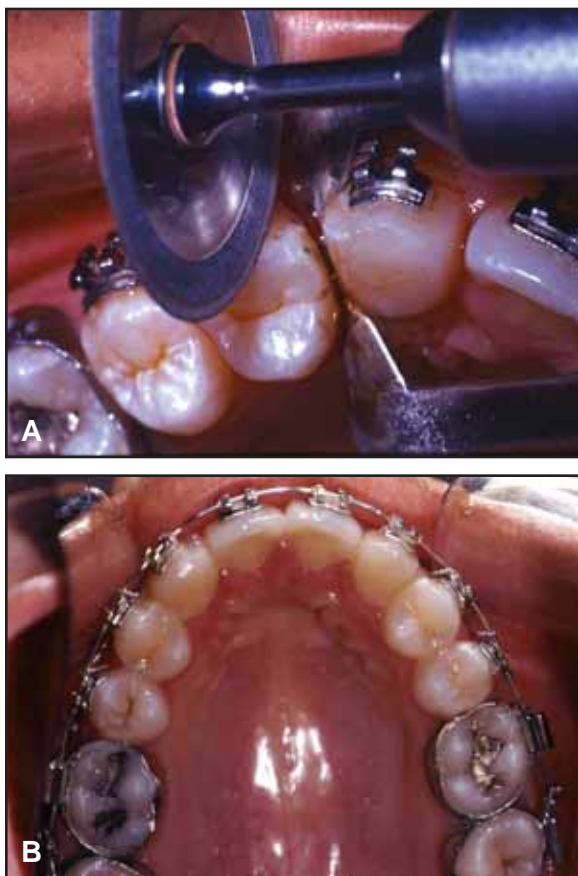


Fig. 4 A. Recontouring of canines after correction of transposition. B. Patient near end of treatment, after recontouring of canines.

chief complaint of crooked teeth (Fig. 2). Clinical examination revealed peg-shaped maxillary lateral incisors and partial transposition of the maxillary right canine and first premolar. Agenesis of the mandibular left second premolar was also noted. The patient had a Class I molar relationship and a Class I canine relationship on the left side, but a canine malocclusion on the right side. Although she had a convex profile resulting from bimaxillary protrusion, cephalometric evaluation showed a good maxillomandibular relationship (Fig. 2, Table 1).

TABLE 1
CEPHALOMETRIC DATA

	Pretreatment	Post-Treatment
SNA	87°	88°
SNB	80°	80°
ANB	7°	8°
GoGn-SN	42°	40°
Po-NB	0mm	2mm
1/NA	5°	3°
1-NA	1mm	1mm
1/NB	26°	27°
1-NB	8mm	9mm
AO-BO	1mm	3mm
S-LS	4mm	3mm
S-LI	7mm	4mm

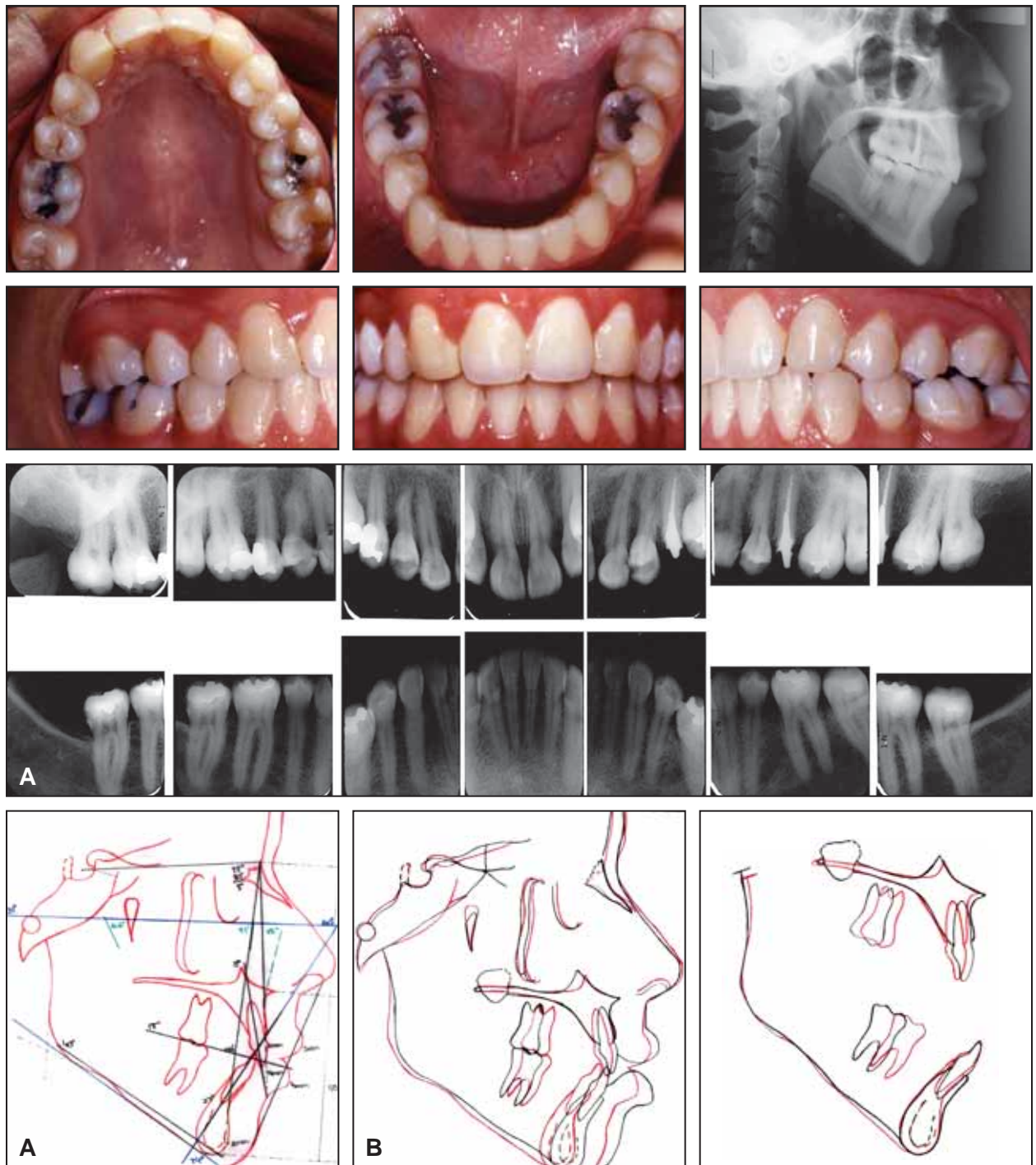


Fig. 5 A. Patient after 36 months of treatment. B. Superimposition of pre- and post-treatment cephalometric tracings.



Fig. 6 Follow-up records taken four years after end of treatment.

The treatment plan for the maxillary arch was to extract both lateral incisors and move the canines into the lateral incisor positions, using a JOB Spring on the right side, while moving the first premolars into the canine positions. The plan for the mandibular arch was to extract the right second premolar to improve dental alignment. The extractions were also needed to correct the bimaxillary protrusion.

After edgewise brackets were bonded, the JOB Spring was inserted and activated to move the maxillary right first premolar palatally (Fig. 3). The adjacent canine was moved mesially with elastic chain. When adequate space was available for the premolar, it was moved into its new position using elastics.

After 10 months of treatment, the transposition had been corrected. The maxillary canines were then recontoured over a period of two months to resemble lateral incisors (Fig. 4). An adequate occlusal relationship was achieved after 36 months of active treatment (Fig. 5, Table 1). A maxillary wraparound retainer was delivered, and an .028" stainless steel 3-3 lingual retainer was bonded in the mandibular arch. Follow-up records taken four years after the end of treatment showed good long-term stability (Fig. 6).

Conclusion

The JOB Spring is a simple and effective device that can allow correction of canine-first premolar transposition in the maxillary arch. The results obtained in this case show the potential benefits of treating this challenging malocclusion.

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