A plate that incorporates a Ti-Ni alloy wire can rapidly correct scissors bite. This article describes its use in the successful treatment of scissors bite. A female patient aged 7 years, 5 months with mixed dentition presented with a Class I molar relationship, Class I skeletal pattern, and average Frankfort-mandibular plane angle. The maxillary right central incisor was in a crossbite. A unilateral posterior scissors bite was also present on the left side. The plate was fitted and prescribed for nighttime wear. Positive overjet was achieved after 1 month of treatment. The posterior scissors bite was corrected after 3 months of treatment, and the midline shift was ameliorated. Because a Ti-Ni wire maintained a weak continuous force, the treatment period was minimized. ORTHODONTICS (CHIC) 2013;14:e222–e226. doi: 10.11607/ortho.921

Key words: scissors bite, Ti-Ni wire, mixed dentition, removable plate

Crossbite elastics1 with transpalatal arch appliances2,3 and lingual arch appliances4 have been used to treat scissors bite. However, these devices induce molar extrusion in both jaws and may cause occlusal interference, making them unsuitable for children with a mixed dentition. The authors developed a plate that incorporates a Ti-Ni alloy wire and herein report its use in the successful treatment of scissors bite.

CASE REPORT

Diagnosis
A female patient aged 7 years, 5 months with mixed dentition presented with a Class I molar relationship, Class I skeletal pattern, and average Frankfort-mandibular plane angle (Fig 1). Her mother reported that she had no oral habits. She was in excellent physical and dental health. The maxillary dental midline coincided with the facial midline, and the mandibular dental midline was 2.0 mm to the right of the facial midline. The maxillary right central incisor was involved in a crossbite. A unilateral posterior scissors bite was also present on the left side. Both the maxillary and mandibular arches were symmetric, with the exception of the maxillary left first molar. A functional lateral shift was detected between the centric relation and centric occlusion.

Treatment plan
The treatment plan involved elimination of the anterior crossbite, correction of the posterior scissors bite, and establishment of a positive overjet.
Appliance fabrication
An alginate impression was taken of the maxillary arch. A 0.035-inch Co-Cr alloy wire was placed palatally, 0.024-inch stainless steel interproximal ball clasps were placed between the primary molars, and a 0.016 × 0.022–inch Ti-Ni alloy wire (LH wire, Tomy International) was placed against the left first molar. The base of the plate was made of acrylic. A posterior bite block was incorporated on both sides of the plate except for the left first molar. A curved 0.016 × 0.022–inch Ti-Ni alloy wire was placed palatal to the right central incisor to enhance correction of the anterior crossbite.

Treatment progress
A lingual button was bonded to the buccal surface of the maxillary left first molar. The plate was fitted and prescribed for nighttime wear (Fig 2). Compliance was excellent with no appliance breakage. Positive overjet was achieved with 1 month of treatment. The posterior scissors bite was corrected with 3 months of treatment, and the midline shift was ameliorated (Fig 3). The posterior scissors bite on the left side was corrected (Fig 4). A posttreatment cephalometric radiograph was taken after 1 year for observation (Fig 5). The mandibular plane angle was not increased.
DISCUSSION

Scissors bite is characterized by labial eruption of the maxillary molar. Either the maxillary molar does not occlude with its mandibular antagonist tooth or contact is made between the lingual surface of the maxillary lingual cusp and the buccal surface of the mandibular buccal cusp. Scissors bite is classified as a unilateral buccal posterior crossbite. Its incidence has been reported to be <1.0% or 1.0% to 2.0%.5,6

Fig 3  Intraoral photographs after 3 months of treatment.

Fig 4  Buccal and distal views of pretreatment (a and b) and posttreatment (c and d) dental casts.
Scissors bite is caused by an arch-length discrepancy in the posterior region. The maxillary first molars tend to erupt buccally, whereas the mandibular first molars tend to erupt lingually. This tendency for a contradictory direction of eruption may produce a posterior crossbite (scissors bite).\textsuperscript{7,8}

The primary problems in correcting a scissors bite are (1) buccal tipping with overextrusion of the maxillary molar, (2) lingual tipping with overextrusion of the mandibular molar, (3) a molar position that is resistant to correction, and (4) a lack of space for appliances on the palatal side of the maxillary molar and buccal side of the mandibular molar.\textsuperscript{9}

Several treatment modalities have been used for the correction of scissors bite.\textsuperscript{1–4} However, these modalities induce molar extrusion in both jaws and may cause occlusal interference. In patients with mixed dentition, scissors bite causes extrusion of the maxillary molar that is accompanied by occlusal interference and a mandibular functional shift with growth. Therefore, early treatment is needed.

In this case, the use of crossbite elastics was not suitable because the anterior teeth were involved in a crossbite. The maxillary first molars were erupting; thus, the placement of a band was not appropriate. Further, bonding was impossible because of the lack of space. Fixed appliances make it more difficult to perform oral hygiene compared with removable appliances.

Yun et al.\textsuperscript{9} and Park et al.\textsuperscript{10} reported the use of miniscrew anchorage for the correction of scissors bite by intrusion of the maxillary and mandibular second molars. However, miniscrew anchorage is difficult to apply in children.

The correction of scissors bite has been shown to take 5 months using a bonded constriction quad-helix appliance.\textsuperscript{11} On the other hand, we used a removable plate with a Ti-Ni wire to eliminate the anterior crossbite and posterior scissors bite. Because a Ti-Ni wire with a shape-memory effect and low-stress hysteresis was incorporated, the plate was simple to fit and maintained a weak continuous force.\textsuperscript{12} Therefore, the treatment period was minimized.

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**Fig 5** (a) Superimposition of pretreatment (black line) and posttreatment (red line) cephalometric tracings. (b) Superimposition of the pretreatment (black line) and posttreatment (red line) maxillary segments.
By the horizontal activation of the posterior wire, the left first molar moved palatally. Crossbite elastics have a vertical component of force in addition to the horizontal component and thus induce molar extrusion in both jaws. The minimum decrease in overbite was observed in the posttreatment intraoral photographs (see Fig 3) compared with those taken before treatment (see Fig 1). Although the elongation of the first molar was observed in the superimposition (see Fig 5), the authors speculate that the bite opening caused by the plate was considerably reduced since the mandibular plane angle was almost stable after 1 year during the growth period.

CONCLUSIONS

The removable plate with a Ti-Ni wire is a simple appliance that can result in rapid achievement of normal occlusion without occlusal interference. The results in this patient suggest that the plate is a viable treatment option.

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REFERENCES