

# Early Treatment of Scissor Bite

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**A** scissor bite is defined as buccal displacement of a maxillary posterior tooth, with or without contact between the lingual surface of the maxillary lingual cusp and the buccal surface of the mandibular antagonist's buccal cusp.<sup>1-5</sup> A complete buccal crossbite, known as a Brodie bite, is caused by a combination of excessive maxillary width and a narrow mandibular alveolar process, although the width of the mandibular base is usually normal.<sup>3</sup> If the mandibular dentition is completely contained within the maxillary arch, the patient can develop severe occlusal difficulties, including an inability to make lateral excursions. This rare condition can be challenging to correct, even with surgical-orthodontic treatment.<sup>1,2</sup>

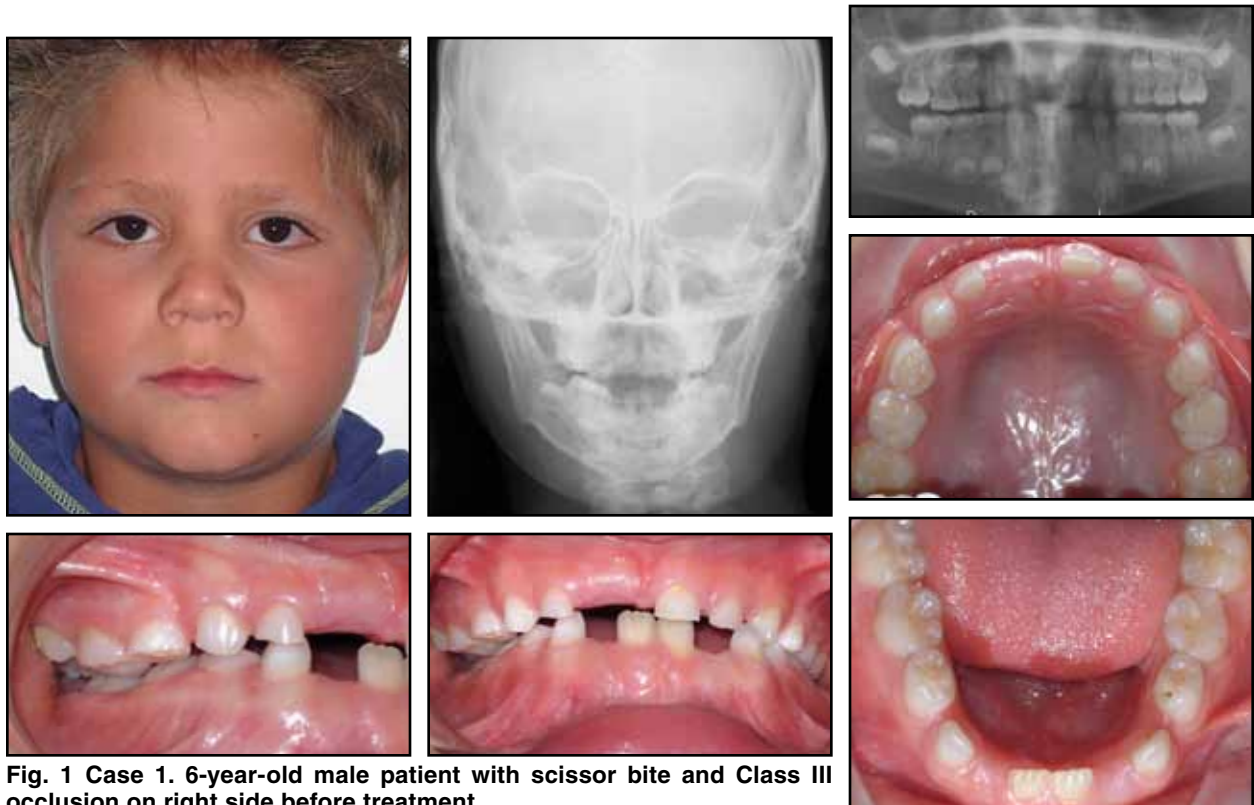
The primary problems involved in scissor-

bite correction are buccal tipping and overextrusion of the maxillary molar, combined with lingual tipping and overextrusion of the mandibular molar. Lack of space to place appliances on the palatal side of the maxillary molar and the buccal side of the mandibular molar make treatment even more difficult.<sup>6</sup> If a tooth is missing, the stability of both arches can be jeopardized.<sup>3</sup>

Early treatment is critical in dealing with scissor bite, as shown in this article.

## Case 1

A 6-year-old male in the early mixed dentition presented with a complete scissor bite, including the first permanent molars, on the right side (Fig. 1). Clinical examination in maximum inter-



**Fig. 1** Case 1. 6-year-old male patient with scissor bite and Class III occlusion on right side before treatment.



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cuspation revealed a Class III malocclusion on the right side and a Class I occlusion on the left; the lower dental midline was deviated slightly to the left. The lower arch was extremely constricted, with severe bilateral lingual tipping. A functional shift to the left was noted from centric relation to centric occlusion, involving a corresponding deviation of the chin and mandibular midline. An antero-posterior radiograph taken with the teeth apart and a panoramic radiograph indicated normal mandibular basal bone without skeletal asymmetry.

Because of the bilateral mandibular lingual

tipping with a functional shift, the scissor bite was corrected by tooth movement alone. Buccal tipping of the lower arch was accomplished with a cemented mandibular expansion appliance and bite plate (Fig. 2). The expander was activated with a quarter-turn of the screw every two days for three weeks, left passively in place for two more months, and then used as a removable retainer for an additional month.

Treatment was finished in four months (Fig. 3). Six months later, the occlusion had remained stable (Fig. 4).

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**Fig. 2 Case 1. Cemented mandibular expansion appliance with bite plate.**



**Fig. 3 Case 1. After four months of expansion treatment.**



**Fig. 4 Case 1. Patient six months after end of scissor-bite treatment.**



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**Fig. 5** Case 2. 8-year-old male patient with complete scissor bite on right side and slight lower midline shift before treatment.



**Fig. 6** Case 2. Cemented mandibular expansion appliance with bite plate; cross-elastics worn from buccal surfaces of upper right first permanent molar and second deciduous molar to attachment on posterior lingual surface of mandibular expander.



**Fig. 7 Case 2.** After four months of treatment, showing composite added to occlusal and buccal surfaces of lower right first molar and acrylic removed from mandibular expander in that area; cross-elastics worn between buccal surfaces of upper right first permanent molar and second deciduous molar and lingual button on lower right first molar, and between upper right and left first molars and second deciduous molars.



**Fig. 8 Case 2.** Two months later, after removal of bite plate and composite buildup on lower right first molar.



**Fig. 9 Case 2.** Patient three months after end of eight-month interceptive treatment.



**Fig. 10 Case 2.** Patient one year after end of treatment.

### Case 2

An 8-year-old male in the mixed dentition presented with a complete scissor bite, including the first permanent molars, on the right side (Fig. 5). Clinical examination showed a bilateral Class I malocclusion and a slight shift to the left of the lower dental midline, but no functional chin component. The upper arch was extremely wide, with buccal tipping more pronounced on the right side, while the lower arch was extremely constricted, with lingual tipping also more pronounced on the right side. Functional analysis revealed a true unilateral scissor bite due to dental positioning, and the skeletal asymmetry was confirmed by an anteroposterior radiograph taken with the teeth apart and a panoramic radiograph.

The treatment plan was to correct the scissor bite through tooth movement alone. Buccal tipping in the lower arch was carried out using a cemented mandibular expansion appliance with a bite plate; lingual tipping in the upper arch involved cross-elastics from the buccal surfaces of the upper right first permanent molar and second deciduous molar to an attachment on the posterior-lingual surface of the mandibular expander (Fig. 6). The expansion appliance was activated one-quarter turn every two days for three weeks.

Four months after the beginning of treatment, the lower right first molar showed little correction, so the acrylic resin in this region was completely removed to allow placement of cross-elastics between the tooth's lingual surface and the buccal surfaces of the upper right first molar and

second deciduous molar (Fig. 7). Elastics were also worn between the upper right and left first molars and second deciduous molars. Composite was added to the occlusal and buccal surfaces of the lower right first molar so it would come into contact with the upper first molar.

Two months later, the composite and the mandibular expander were removed (Fig. 8). The elastics were worn for two additional months, for a total treatment time of about eight months (Fig. 9). One year after the end of the interceptive treatment, the patient's occlusion had remained stable (Fig. 10).

### Case 3

A 12-year-old male in the mixed dentition presented with a scissor bite between the upper and lower left first permanent molars, due to pronounced buccal and lingual tipping (Fig. 11). He had a Class I occlusal relationship, and the maxillary and mandibular dental midlines were coincident with the facial midline.

A lingual arch was placed, and a bite plate omitting the lower left first molar was cemented to allow the opposing first-molar cusps to cross during correction. Cross-elastics were applied from the buccal surface of the upper left first molar to the lingual surface of the lower left first molar to correct the tipping of these teeth (Fig. 12).

After two months of treatment, the mandibular appliance was removed; the elastics were worn for another month. Three months later, the occlusion was still stable (Fig. 13).



**Fig. 11** Case 3. 12-year-old male patient with scissor bite of upper and lower left first permanent molars before treatment.



**Fig. 12 Case 3.** Lingual arch with bite plate cemented in lower arch, omitting lower left first molar; cross-elastics worn between upper and lower left first molars.



**Fig. 13 Case 3.** Patient three months after end of scissor-bite treatment.

#### Case 4

An 11-year-old female presented with a scissor bite between the upper and lower right first and second premolars, attributable to lingual tipping in the mandibular buccal region (Fig. 14). She exhibited a bilateral Class II occlusion, a pronounced deep bite, and a midline discrepancy of about 2mm due to a slight shift of the mandible to the left. Facial analysis revealed a collapsed chin and a distally positioned mandible.

To correct the mandibular position and resolve the partial scissor bite, bite turbos were bonded to the lingual surfaces of both maxillary central incisors (Fig. 15). The scissor bite improved after forward movement of the mandible and lateral disclusion from lower-incisor contact with the bite turbos. To allow full correction of the scissor bite, composite was added to the occlusal and buccal surfaces of the lower right first premolar, and a lingual button was bonded for attachment of a cross-elastic (Fig. 16).

Eight months after the beginning of treatment, centric occlusion and centric relation were nearly coincident, with normal overjet and overbite (Fig. 17). The bite turbos were to be left in place until eruption of the second molars and completion of full-arch fixed-appliance therapy.

#### Discussion

A scissor bite in itself might not cause pathogenesis in a young patient, but a compromised occlusion could eventually lead to TMD.<sup>7</sup> The width of the mandibular base can be normal, as in Case 1, or asymmetrical, as in the slightly older patient shown in Case 2. Adaptive remodeling of the TMJs, which may already have occurred by the mixed-dentition stage,<sup>8</sup> can promote such asymmetrical mandibular growth.<sup>9,10</sup> Since there is still adequate time for growth modification in the mixed dentition, the asymmetry can be largely eliminated if the crossbite and functional shift are treated as early as possible.<sup>11,12</sup>



**Fig. 14 Case 4. 11-year-old female patient with scissor bite on right side, Class II malocclusion, constricted lower arch, and severe deep bite before treatment.**



**Fig. 15 Case 4. Bite turbos bonded to lingual surfaces of upper central incisors to disclude dentition.**



**Fig. 16 Case 4. Composite added to occlusal and buccal surfaces of lower right first premolar; cross-elastic worn from buccal surface of upper right first premolar to lingual surface of lower right first premolar to improve occlusal contact.**



**Fig. 17 Case 4. Patient after eight months of scissor-bite treatment.**

Several authors have reported that the maxillary molars tend to erupt with buccal crown torque and then upright over time, while the mandibular molars erupt with lingual crown torque and then upright.<sup>13</sup> Uprighting of lingually tipped mandibular molars is thus a reasonable objective of orthodontic treatment. Any expansion resulting from mandibular molar uprighting will create additional arch perimeter, as in Cases 1, 2, and 3.

The importance of postero-anterior cephalometric analysis in quantifying skeletal asymmetries has been well established.<sup>10,14</sup> In the absence of such asymmetries, however, PA cephalograms offer little information for evaluating crossbites; the morphology of the alveolar process is far more evident on dental casts.<sup>15</sup> The PA radiograph in Case 1, for example, shows a symmetrical mandibular base, but the radiograph for Case 2 shows evidence of antegonial and ramal changes between the two sides. Panoramic radiographs can be helpful in confirming these findings.

A lateral deviation of the chin can usually be noted in a frontal facial examination. In the absence of a lateral shift, findings of basal asymmetry and unilateral crossbite will establish a true unilateral skeletal asymmetry. If a unilateral crossbite is found without skeletal asymmetry and a lateral shift, it is most commonly the result of transverse tooth malpositions.<sup>16</sup> In Case 1, with a lateral functional shift and a scissor bite caused mainly by mandibular lingual tipping on both sides, with more repercussions on the side of the scissor bite, a mandibular expansion appliance could be used without elastics. On the other hand, Case 2, with a true unilateral scissor bite reflected not only in the mandibular arch, but also in the maxillary arch, needed to be treated with both a mandibular bite-plate expander and cross-elastics on the scissor-bite side, allowing biomechanics to exert an almost unilateral effect. Elastics were also used to connect the right and left sides of the maxilla and thus avoid overexpansion of the max-



illary arch.

For scissor bites that are correctable by tooth movement alone, lower buccal tipping and upper lingual tipping can be accomplished with expansion-plate appliances and cross-elastics. In Case 3, where the scissor bite affected only the left first molars, the patient needed to wear a bite plate excluding the first molars to provide enough interarch space for the opposing molar cusps to cross during correction with cross-elastics.

Transverse interarch relationships change as sagittal interarch relationships change. Those transverse discrepancies can be relative or absolute, as determined by examination of the patient's study casts.<sup>16</sup> In Case 4, the Class II malocclusion was accompanied by a partial posterior scissor bite that improved when the casts were articulated into a Class I canine relationship, demonstrating a relative transverse discrepancy. Since the transverse discrepancy of the right first premolars was not completely corrected, it appeared to be absolute at that level.

### Conclusion

Early diagnosis of scissor bite is essential to correct the inclination of the compromised teeth and thus prevent a lateral shift of the mandible before adaptive remodeling of the TMJ can cause asymmetrical mandibular growth. A mandibular expansion appliance with bite plates and cross-elastics has been shown to be an effective combination for bringing the teeth into occlusion. In a scissor-bite patient with an abnormal sagittal interarch relationship, such as mandibular retrusion, the sagittal problem should be treated first to correct the relative transverse discrepancy.

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