

## 유치열에서 scissors bite의 치료에 대한 증례보고

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### 국문초록

중심교합위 상태에서 편측이나 양측으로 구치부의 상악치아가 하악치아의 협측으로 위치한 경우를 scissors bite라고 한다. 이런 부정교합은 상악의 폭이 크거나 하악의 폭이 좁은 경우 발생한다. 이로 인해 턱의 성장이 방해받고 악공간 부조화를 유발하며 적절한 저작을 할 수 없게 된다. 따라서 scissors bite는 즉시 차단 교정을 해야 하며 일반적으로 scissors bite의 치료는 고정성 또는 가철성 장치를 이용하여 하악을 확장한다.

이에 저자는 scissors bite를 보이는 환자의 4세의 두 명의 남아에게 Schwarz 장치를 이용하여 양호한 결과를 얻어 scissors bite의 치료법 제시에 도움이 되고자 보고하는 바이다.

**주요어** : Scissors bite, Schwarz 장치

### I. INTRODUCTION

A scissors bite in the posterior teeth occurs unilaterally or bilaterally when the upper teeth are positioned totally buccal to the lower teeth in centric occlusion.

There are different definitions for this type of malocclusion. Brodie<sup>1)</sup> described a mandibular arch telescoped within the maxillary arch. In particular, when the rare buccal crossbite in which all of the lower teeth is positioned lingual to the upper teeth occurs in patients having a retrusive and small mandible or a large maxilla, this is referred as the Brodie syndrome. Sim<sup>2)</sup> used the term "bilateral buccal crossbite" when the maxillary arch enclosed the mandibular arch. van der Linden and Boersma<sup>3)</sup> defined a

scissors bite as total "endo-occlusion" of mandibular posterior teeth. Mills<sup>4)</sup> also used the term "scissors bite" and Moyers<sup>5)</sup> characterized a bilateral skeletal type crossbite as "an osseous disharmony between mandible and maxilla".

This malocclusion can result from either excess width of maxilla, deficient width of the mandible, or a combination of both. According to the U.S. Public Health Service Survey, scissors bite occurs in less than 0.01% of the population<sup>6)</sup>.

In case of a scissors bite, the malocclusion can lead to hindered growth of jaws or to asymmetry between the jaws. If the unilateral mandibular posterior teeth are telescoped within maxillary arch, the mandibular midline deviates to the side of the maxillary midline. Besides, the severe lingual inclination of the mandibular posterior teeth prevents adequate mastication. Thus, the scissors bite is in need of immediate interceptive orthodontic intervention<sup>7)</sup>.

The common treatments of scissors bite are to expand the mandibular arch. Mills<sup>4)</sup> reported the use of modified fixed appliances such as a split lingual arch and Williams<sup>8)</sup> suggested an innovative mandibular

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labial appliance. Tulley and Campbell<sup>9</sup> used a removable mandibular appliance with an expansion screw.

There are few case reports for the treatment of scissors bite in primary dentition until now. In our clinic, we made a success in treatment of the scissors bite using the Schwarz appliance. We wish to help to treat a scissors bite.

## II. CASE REPORT

### Case 1

4 years, 5 months old, a Korean boy was examined with the chief complaint of disharmony of the jaws and anterior crossbite(Fig. 1).

The patient was unable to establish centric occlusion because the left mandibular posterior teeth were telescoped within the maxillary arch. Skeletal midline was correct in the analysis of PA radiograph, but the mandibular dental midline deviated to the right of maxillary midline. With the midline approximately aligned intentionally, posterior occlusion was minimal.

When we examined intermolar width at the primary second molar, the width between mesiobuccal cusps in maxillary arch was 50.0 mm, and the same measurement in the mandibular arch was 35.0 mm. The intermolar width in maxillary arch was greater than two deviations from the mean of 45.5 mm, whereas the intermolar width in mandibular arch was

deficient by more than one standard deviation from the mean of 38.2 mm. Intercanine width at the primary canine cusp tips in maxillary arch was 30.5 mm, and the same measurement in the mandibular arch was 22.5 mm. The intercanine width in the mandibular arch was deficient by more than one standard deviation from the mean of 24.4 mm(Table 1).

A lateral cephalometric evaluation showed the maxilla was slightly retruded and the facial type was severe brachy-facial. An anterior-posterior cephalometric evaluation showed an acceptable range for skeletal measurements for the patient's age and gender.

The specific treatment objects were to expand the mandibular arch bilaterally and to protrude the maxillary anterior teeth so that the teeth would have an acceptable interdigitation. We used the Schwarz appliance to expand the mandibular arch and a removable orthodontic appliance on the maxillary arch with finger springs and posterior bite plate to protrude the anterior teeth. The appliance was activated for 9 months and then we delivered the retainer for the mandibular arch. The patient would be placed on periodic recalls to evaluate the stability of expansion.

After treatment, Intermolar width in the mandibular arch was increased until 39.5mm. Intercanine width in mandibular arch was increased until 27.0 mm(Table 2). The anterior crossbite was improved and the teeth had an acceptable interdigitation (Fig. 2).

**Table 1.** Model analysis of pretreatment

	Pretreatment (mm)	Mean (Korean male)* (mm)
Maxillary intermolar width	50.0	45.45±1.96
Mandibular intermolar width	35.0	38.15±2.30
Maxillary intercanine width	30.5	31.24±1.69
Mandibular intercanine width	22.5	24.36±1.58

\* Study of Korean primary dental arch (Song<sup>10</sup> 2002)

**Table 2.** Model analysis of posttreatment

	Pretreatment (mm)	Posttreatment (mm)
Maxillary intermolar width	50.0	50.0
Mandibular intermolar width	35.0	39.5
Maxillary intercanine width	30.5	34.5
Mandibular intercanine width	22.5	27.0



Fig. 1. Intraoral view of pretreatment.

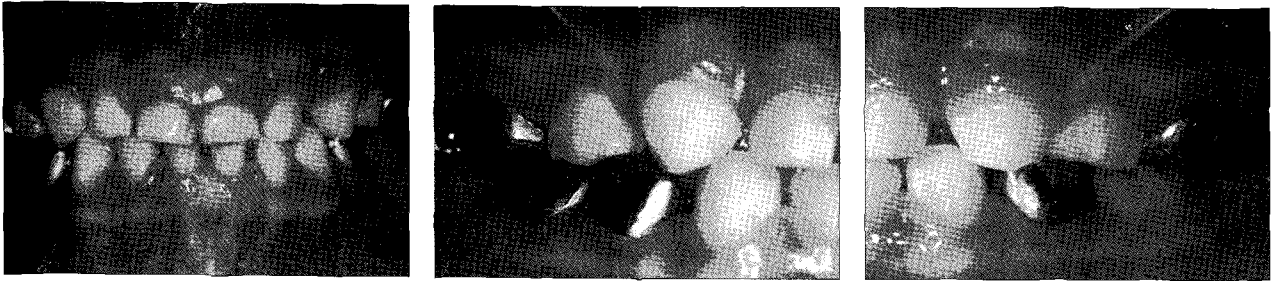


Fig. 2. Intraoral view of posttreatment.

Case 2

4 years, 2 months old, Korean boy was examined with the chief complaint of the discoloration of the right primary central incisor. During the examination, a scissors bite was examined at the right posterior teeth. The mandibular dental midline deviated to the left side of maxillary midline(Fig. 3).

The intermolar width in maxillary arch was 50.5 mm, and the same measurement in the mandibular arch was 35.5 mm. The intercanine width in maxillary arch was 33.5 mm, and in the mandibular arch 22.0 mm. The intermolar width in maxillary arch was greater than two deviations from the mean of 45.5 mm, whereas the intermolar width in mandibular arch was deficient by more than one standard de-

Table 3. Model analysis of pretreatment

	Pretreatment (mm)	Mean (Korean male)* (mm)
Maxillary intermolar width	50.5	45.45±1.96
Mandibular intermolar width	35.5	38.15±2.30
Maxillary intercanine width	33.5	31.24±1.69
Mandibular intercanine width	22.0	24.36±1.58

\* Study of Korean primary dental arch (Song<sup>10</sup> 2002)

Table 4. Model analysis of post-treatment

	Pretreatment (mm)	Posttreatment (mm)
Maxillary intermolar width	50.5	50.5
Mandibular intermolar width	35.5	40.5
Maxillary intercanine width	33.5	34.5
Mandibular intercanine width	22.0	25.5

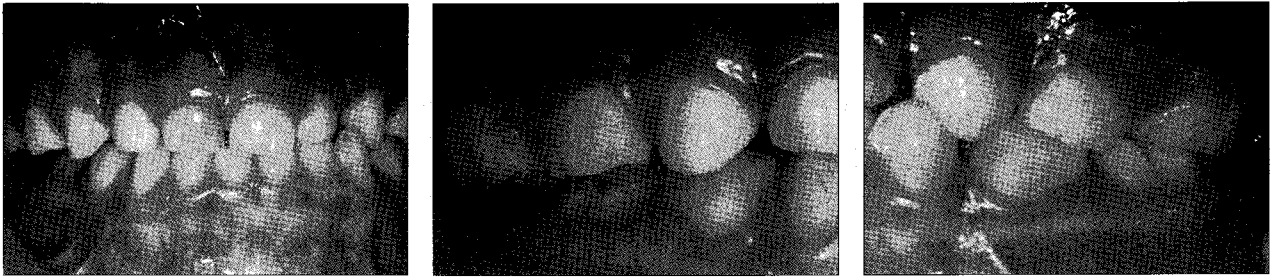


Fig. 3. Intraoral view of pretreatment.

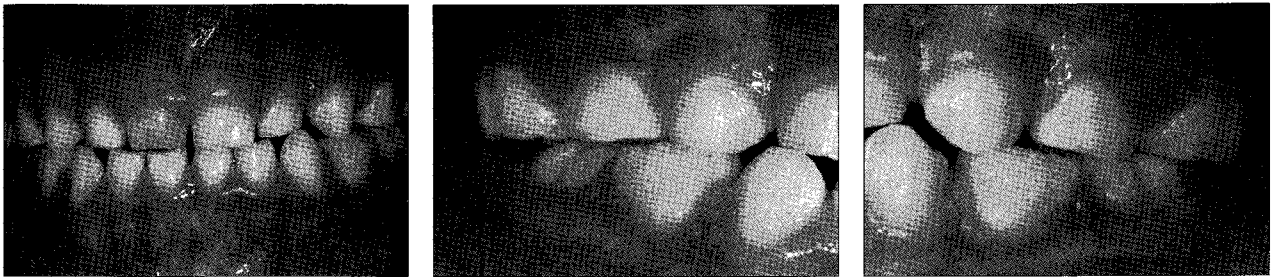


Fig. 4. Intraoral view of posttreatment.

viation from the mean of 38.1 mm. The intercanine width in maxillary arch was greater than one standard deviation, but in the mandibular arch was deficient by more than one standard deviation from the mean of 24.4 mm (Table 3).

The lateral and anterior-posterior cephalometric evaluation showed an acceptable range for the patient's age and gender.

The treatment object was to expand the mandibular arch bilaterally with a Schwarz appliance. The appliance was activated for 8 months. After stopping the activation, the appliance was used as a retainer without activation.

After treatment, the intermolar width in the mandibular arch was increased until 40.5 mm. And intercanine width in mandibular arch was increased until 25.5 mm (Table 4, Fig. 4).

### III. DISCUSSION

The early expansion of the mandibular arch is indicated in determining the treatment plan of scissors bite. Severe bilateral lingual inclination of the mandibular posterior teeth prevents adequate masti-

cation. This can be the patient's chief complaint. Also, the malocclusion can lead to hindered growth of jaws or to asymmetry between jaws. Therefore, the scissors bite is in need of immediate interceptive orthodontic intervention.

Bilateral expansion of the mandibular arch during primary dentition could establish proper interdigitation. It can allow for the permanent teeth to erupt into an acceptable interdigitation<sup>11)</sup>. After expansion, the mandibular arch should be retained with a lingual arch until the late mixed dentition; then the patient would be placed on periodic recalls to evaluate the stability of expansion in the permanent dentition.

Kisling<sup>12)</sup> illustrated a unilateral posterior scissors bite of the primary dentition. When the midlines coincided, cuspal interferences were noted. Bite exercises and selected grinding resulted in an immediate slight decrease in the maxillary arch width and a slight increase in the mandibular arch width. These procedures resulted in further correction of the scissors bite during the primary dentition. Kisling acknowledged that functional grinding was seldom in the only treatment, and noted that a mandibular re-

movable expansion plate should be used.

With many treatment option available for the mandibular expansion, the lower Schwarz appliance was chosen. If encroachment of the tongue space would make the appliance difficult for the patient to tolerate, a fixed removable lingual arch with adjustment loops could be chosen.

We could consider the contraction of maxillary arch because intermolar width in the maxillary arch was greater than a mean. But it is not possible actually.

In the treatment of scissors bite, the retention is very important because the relapse is common in the expansion of the mandibular arch, especially intercanine width. When the interdigitation is acceptable and the patient's cooperation is good, the retention would be acceptable. So, the periodic recall is very important.

#### IV. CONCLUSION

Efficient mastication is impossible when the mandibular arch is telescoped within the maxillary arch. If the malocclusion remains, the mandibular permanent teeth can erupt into similar positions. So, many problems can be caused. This case report demonstrated that mandibular arch expansion with the lower Schwarz appliance during the primary dentition increased posterior intraarch width to establish maximum interdigitation.

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**Abstract**

**TREATMENT OF THE SCISSORS BITE IN PRIMARY DENTITION : CASE REPORT**

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A scissors bite in the posterior teeth occurs when the upper teeth are positioned totally or unilaterally buccal to the lower teeth in centric occlusion.

This malocclusion can result from either excessive width of maxilla, deficient width mandible, or combination of both. The malocclusion can lead to hindered growth of jaws or to asymmetry between the jaws. Besides, the severe lingual inclination of the mandibular posterior teeth prevents adequate mastication. Thus, the scissors bite is in need of immediate interceptive orthodontic intervention.

The common treatments of the scissors bite is to expand the mandibular arch: fixed or removable appliances. In our clinic, we made a success in treatment of the scissors bite using the Schwarz appliance. We treated the scissors bite using the lower Schwarz appliance for a mean observation period of 21 months. The subjects were 2 boys, aged 4 years.

**Key words** : Scissors bite, Schwarz appliance