

An efficient new (Niu's) method for correcting anterior dental crossbite with or without posterior crossbite of primary and early mixed dentition

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Dental malocclusion may start in the primary dentition. The orthodontic treatment of most types of malocclusion could be postponed until late mixed dentition or permanent dentition. But some of them do need early attention because they could cause skeletal malformation of the maxillofacial skeleton. Anterior dental crossbite is one of the few types of malocclusion could be benefited from early intervention.

Anterior dental crossbite may be caused by the excessive growth of the mandible, underdevelopment of the maxilla or combination of the above two situations. It may also simply be caused by the maxillary incisors erupting in a palatal direction because their usual pathways are blocked by the prolonged retained primary incisors. Anterior dental crossbite patients are often forced to bite into a further protruded position in order to close their

bite. Therefore anterior dental crossbite may change the direction of the growth of mandible. The anterior crossbites could be divided into a true anterior dental crossbite which is termed as skeletal class III and a functional anterior crossbite which is also called pseudo class III. Occlusal trauma of the functional anterior crossbite not only could cause the gingival recession of the mandibular incisors, it could also cause the destruction of the alveolar bone of the mandibular incisors. Sometimes it may lead to the loss of the mandibular incisors. If the pseudo class III caused by functional anterior crossbite is left untreated, the patients may develop into permanent skeletal class III. It is very difficult to treat skeletal class III with orthodontic appliances only. To achieve the optimal result, orthognathic surgery combined with the fixed orthodontic appliances often is the only treatment of choice.

Not only is the cost of surgery excessive for the patients to afford it, there are also many risk factors such as relapse, lip numbness, and even loss of life. Therefore many adults would rather suffer from the misfortune of the class III malocclusion rather than face the risks of the treatment.

Posterior dental crossbite, especially the unilateral posterior dental crossbite often cause the shift of the mandible to one side of the fact. Such shift can be corrected if it is treated at an early stage. If it is left untreated, the mandibular shift usually develops into a more severe state in adulthood. Then, orthognathic surgery combined with fixed orthodontic appliances is the treatment of choice to achieve the optimal result.

Unfortunately anterior crossbite and posterior crossbite frequently occur in a patient simultaneously.

Many different appliances and mechanics have been developed to correct the above problems, such as: retainers with different designs of the spring, the Frankel appliance, and the 2×4 or 2×2 utility archwires, these were developed to correct the anterior crossbite by tipping maxillary incisors labially: retainers with expansion screw, quadhelix, the Hyrax expansion

appliance were developed to correct posterior crossbite: Corzat appliance and retainers with expansion screw and different designs of springs were also developed to correct the anterior and posterior crossbite simultaneously.

Removable appliances such as retainers with springs and/or expansion screw, Crozat appliance and Frankel appliance completely depend on the compliance of the patients to wear these appliances which frequently does not work well. Fixed appliances such as Hyrax appliance and quadhelix could only correct posterior crossbite. 2×4 or 2×2 utility archwires could only correct anterior crossbite with minimal overbite. They could not be used for the anterior dental crossbite patient who also has a deep overbite.

After my frustration from the poor compliance of my patients for many years, accidentally, I discovered that the Wilson 3D quadhelix has a similar design as the Crozat appliance. The Wilson 3D quadhelix has two extension arms to push the maxillary incisors labially to correct the anterior dental crossbite and the quadhelix offers the flexibility to expand the maxilla to correct posterior crossbite. The Wilson 3D quadhelix could be ligated to the palatal attachments of the

maxillary molar bands, therefore the patient must wear it all the time. It could also easily be detached from the palatal attachments of the maxillary molar bands for adjustment. The buccal attachments of the maxillary molar bands also offer the versatility for facial mask wear if needed to redirect the growth of the mandible.

The advantages of this method are: 1) low cost: it cost less than \$24.00 if the lingual attachments are welded to the maxillary bands in the office; 2) only a few simple orthodontic instruments are required: a band seater, a how piler, a 3-jaw piler, a needle holder, a ligature cutter, a band removing piler, and a spot welding machine (which is optional if the attachments are to be welded in the office.) 3) only 4 kinds of special material are needed: maxillary molar bands, Wilson lingual tubes (attachment), Wilson 3D quadhelix, ligature wire. 4) it is easy to detach or re-attach the Wilson quadhelix for use in different stages. After the correction of the anterior crossbite of the central incisors, the Wilson 3D quadhelix appliance can be removed to offer maximal comfort for the patients. If the lateral incisors erupt into the anterior crossbite again, the same Wilson 3D quadhelix ap-

pliance can be reinserted to correct the problem. On the contrary, the removable retainer used to correct anterior crossbite is needed to be worn all the time until the problem is corrected. If it is left out of the mouth for weeks, the patient usually has difficulty to wear the same retainer again. A new retainer would be needed, which would increase the cost of the treatment. Therefore, this new method is a very efficient and practical way to correct anterior dental crossbite.

Case 1. A five year two months old girl with both anterior and unilateral (left) posterior dental crossbite (Figure 1-A through C). After discussion the advantage and disadvantage of early treatment with the patient and her parents. Both the maxillary second primary molars were banded with Wilson lingual attachment on 09-29-93. Wilson 3D quadhelix was inserted on 10-27-93 (Figure 2). After three adjustment visits, both the anterior and unilateral (left) posterior dental crossbite were corrected on 01-31-94 (Figure 3-A through C).

Case 2. A eight years eight months old female patient was referred to my office with a single tooth anterior dental crossbite. Mild gingival re-

cession and tooth mobility of the tooth 24 caused by occlusal trauma was noticed (Figure 4). After consultation with the patient and her parents, both the maxillary second primary molars were banded with Wilson lingual attachment on 10-08-94. Wilson 3D quadrahelix was inserted on 10-17-94. The anterior dental crossbite was corrected in less than a week. On

10-24-94, the anterior crossbite was corrected (Figure 5).

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Before →

Fig. 1-A:

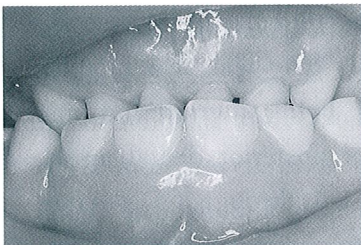


Fig. 1-B:

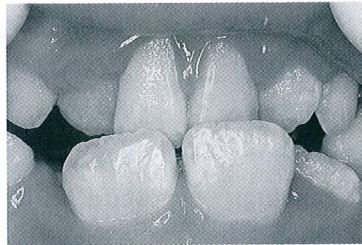
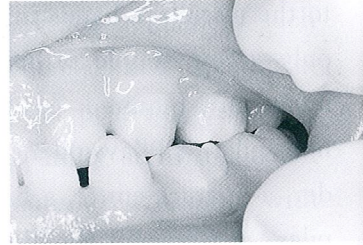


Fig. 1-C:



After →

Fig. 3-A:

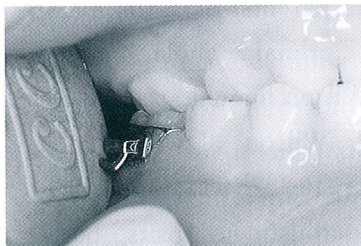


Fig. 3-B:

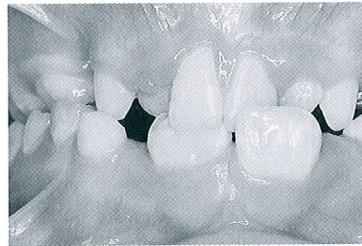


Fig. 3-C:

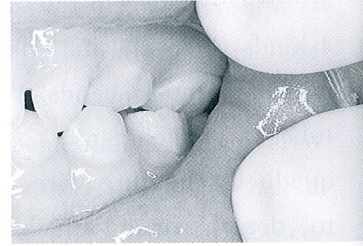


Fig. 2:

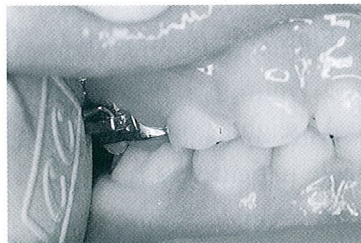


Fig. 4:



Fig. 5:

