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The Han Appliance

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Dr. Bo Kuoon Han

The Han Appliance

One of the pleasures of traveling abroad is that you meet some of the most wonderful people. I enjoyed just such a pleasure during one of my trips to Seoul, Korea where I lectured to the Korean Chapter of the AAFO (the Asian American Association of Functional Orthodontics and TMJ). They invited me to give a 3-day seminar in Seoul and my wife Susan and I thoroughly enjoyed our visit there. We were treated like royalty. We made many new and wonderful friends there, not the least of whom was a most gracious and charming man named Dr. Bo Kuoon Han. I had already met Dr. Han prior to our visit to Korea as he was one of a group of doctors who translated the textbooks I wrote for Dr. John Witzig, "The Clinical Management of Basic Maxillofacial Orthopedic Appliances," into Korean for publication in that country. One of the many other contributions this fine clinician has made to our profession is the development of an ingenious little appliance for treating early Class III problems in the pediatric dentition. It is an appliance that now bears his name—the Han appliance. On his behalf I would like to describe it for you here.
Dr.: Terrance J. Spahl, D.D.S.

At the Advanced Witzig Ortho/TMJ Fall meeting in Minneapolis last year, Dr. Han politely approached me with an invitation to discuss a new appliance he had developed. At first I didn't understand what he was driving at for he started describing correction of anterior crossbites in the deciduous and early mixed dentition using Sagittal II appliance technique and the problems associated with that technique. The more I listened, the more obvious it became to me that he was really onto something. When he pulled a sample appliance out of a little green plastic appliance case and showed it to me, I took one look at it and thought, "Eureka! What a clever appliance design."

Practicing in Seoul, Dr. Han is faced with a higher than average percentage of Class III and pseudo Class III pediatric patients. This, of course, is due to the fact that the Korean population in general has a larger than normal number of Class III individuals as compared to occidental populations according to statistics compiled by the Orthodontics Department of the College of Dentistry, Kungbuk National University.

When anterior crossbites develop in the deciduous dentition and early mixed (deciduous-adult) dentitions, one of the first problems that arises is the posturing of the mandible further forward in a protruded arc of closure adaptive to (or more correctly, "in avoidance of") the anterior area of incisor interference. This makes the case appear more skeletally Class III than it may in fact be. Also, correction of these types of cross bites usually require an appliance with the bite opening effects of occlusal acrylic coverings of some sort and of a thickness sufficient to allow the jumping of the bite anteriorly without collision of the incisal edges of the upper and lower anterior teeth. Hence, the Sagittal appliance seems a natural choice. But there are problems. Sometimes the anchorage of the pediatric dentition fortified by the presence of the first permanent molars, is not sufficient to offset the resistance of the anterior permanent incisors as they are driven anteriorly by routine appliance screw activation. As a result, more distalization of the first permanent molars results than might normally be expected. The second molars are too far up and back in their developing embryonic sacks to be of any assistance anchorage-wise and permanent



Name: B. R. Chung, Age: 7 Y 10 M
I-1 Facial Profile (Front View, Pretreatment).



I-2 Facial Profile (Side View), note prognathic profile.



I-3 Intra-oral View (Pretreatment, Frontal). Note anterior crossbite in permanent incisor area.



I-4 Intra-oral View (Pretreatment, Left Quartering View).

molar distalization to any extent at all is something not at all desirable, especially in cases that are already marginally Class III! Sound upper first permanent molar anchorage in Class III anterior cross bite correction is a must! It is this problem to which Dr. Han directed his vast clinical experience and enormous intellectual talents. (Dr. Han has earned a DDS, MS and PhD!) What he came up with is an intra-oral orthodontic device that looks like a combination of an upside down Bionator III, a Sagittal II and an open ended Activator of Klammt.

The Han appliance is a dual-arch active plate that consists of a solid acrylic lingual plate with a standard inverted Schwarz-type lower labial bow. Acrylic is interposed between the occlusal surfaces of the upper and lower teeth at a thickness adequate to open the bite sufficiently to permit jumping the upper anteriors forward past the lower incisors with out interference from the ineisal edges.

This interocclusal acrylic only covers the lower posterior teeth and serves to unite the lower portion. The interocclusal acrylic forms a connecting bite block fully anatomically interdigitated with the occlusal surfaces of the upper and lower posteriors so as to form a locking bite.

The upper portion of the appliance, when viewed from the top, closely resembles the appearance of a common Sagittal appliance. The entire palate is covered with acrylic as are the occlusal surfaces of the upper teeth (the superior surface of the interocclusal bite block). The palatal portion of the appliance is strategically cut and fitted with two expansion screws such that as the screws are opened, the middle third of the appliance expands forward, Sagittal II style. This forward Sagittal II appliance is fitted with a small wire clip at each distal edge that wraps around the distal edge of the permanent lateral incisors (should they be present) and thereby helps keep the four permanent upper anterior incisors together and helps avoid flaring as these teeth are advanced due to screw activation. There is an open space in the anterior portion of the appliance between the upper advancing middle third portion from cuspid to cuspid that is the product of the thickness of the posterior bite block portion of the appliance. This opening gives the appliance a resemblance to the prototype Activations of Dr. G. Klammt of Gorlitz, Germany.

Since accuracy of fit of the interocclusal bite blocks is a critical component of this technique, the usual rules apply for construction bite registration, i.e., Shur Wax and a water bath at 138 degrees F. Traditional stick compound may also be used. The construction bite is registered in the most retruded arc of mandibular closure possible. This negates the child posturing their lower jaw forward out of habit during construction bite registration to avoid ineisal interferences in the end to end bite.

The beauty of this appliance technique is that when the child wears the appliance and bites into it, the combination of pressure from the palatal surface contact and the forces of the mandibular most retruded (or in this case the nonpropulsed, noncompensated normal Class I "retruded" position) "locked in" occlusion adds up to form a tremendous amount of anchorage that allows all the forces represented by expansion screw activation to be directed anteriorly. This applies force to the maxillary anteriors and the premaxillary suture area in a most efficient fashion which makes for rapid forward development of this area. It is common to obtain beautiful Class III anterior crossbite correction in the early mixed dentition in as little as 3-4 months, and this is without any appreciable component of distalization of the maxillary first permanent molars. It must be remembered that in standard Sagittal II appliance technique the ratio of anterior movement of the six incisors to posterior movement of the bicuspids and molars is roughly 80/20, and that is with 2nd molars all the way in. In the early mixed dentition, when 2nd molars are not yet fully available for maximum anchorage, the A-P ratio in Sagittal appliance technique is much less favorable. Additionally, these patients are



I-5 The Han Appliance in place.



I-6 Intra-oral View, 3 weeks later. Maxillary anterior teeth are jumping up already.



I-7 Two and a half months after treatment. (Frontal View).



I-8 Two and a half months after treatment. (Quartering View).

already on the Class III end of the spectrum of malocclusions, hence maxillary molar distalization of any sort is always counterproductive to the ultimate resolution of the case.

Of course, these appliances cannot be worn during eating and speech is somewhat compromised with their use. However, due to the short treatment time required to correct the case and the fact that the child may remove the appliance for meals, cooperation is generally quite good.

Screw activation follows standard Sagittal II appliance technique with one 90 degree turn of the central cylinder of the expansion screw effected every Sunday and Wednesday, or the equivalent of 1/4 mm expansion per screw twice a week.

This appliance gives beautiful results in a timely manner and is economical for both patient and practitioner alike. It solves one of the more knotty little problems that occurs in the early mixed dentition, i.e., the Class III anterior crossbite, with ease and efficiency. The profession will always be grateful to Dr. Bo Kuoon Han for the great contribution he has made in the development of this little appliance. For more information about the Han Appliance contact Frank Fox or Bobby Middle at 1-800-521-2351.



I-9 Three and a half months after Han Appliance treatment. (Frontal View).



*I-10 Three and a half months after treatment. (Quartering View)
At the completion of jaw orthopedic treatment with the Han Appliance, premaxillae was developed much more so the anterior crossbite were corrected perfectly but the maxillary anterior teeth are still in need of leveling, alignment and rotation which call for Fixed Appliance treatment.*



I-11 The Han Appliance at the completion of treatment. (Side View).



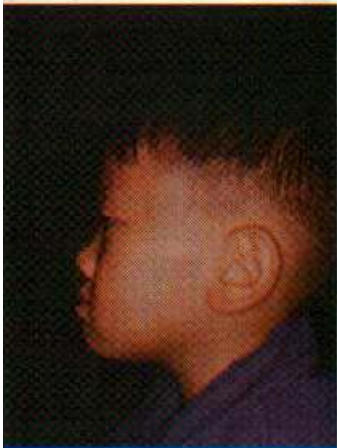
I-12 The Han Appliance at the completion of treatment. (Superior View). Note the opened expansion screws.



Name: S. H. Chung

Age: 5 Y 4 M

II-1 Facial profile. (Frontal View)



*II-2 Facial profile. (Lateral View).
Note severe prognathic profile.*



*II-3 Intra-oral View. (Pretreatment).
Note marked crossbite.*



*II-4 Intra-oral Right Quartering
View (Pretreatment).*



II-5 The Han Appliance in place.



*II-6 Three months after treatment.
(Frontal View).*



*II-7 Three months after treatment.
(Lateral View). Note great correc-
tion of crossbite. It took just three
months treatment.*



*II-8 The Han Appliance at the com-
pletion of three months treatment.
Note the opened expansion screws.
(Superior View).*