SPACE MAINTAINERS LABORATORIES

TIPS AND TECHNIQUES

CORRECTING POSTERIOR CROSS-BITES

DR. ROB W. VEIS, D.D.S.

Written exclusively for dentists.
Designated for one CE Contact Hour.

OVERVIEW

It has been estimated that as many as 75% of children have some form of malocclusion. One of the most common forms of malocclusion is the constriction of the maxillary arch. Children with compromised airways and mouth breathing problems frequently have constricted maxillary arches.

Early treatment – in the mixed dentition stage -- is the key to success in treating an underdeveloped maxilla and correcting posterior cross-bites. The patient's level of cooperation is highest at this stage…and treatment at this point means that more serious future problems can be avoided.

EDUCATIONAL OBJECTIVES

The overall objective of this course is to provide the participant with an evidence-based guide to the advantages, applications and proper procedural protocols for correcting posterior cross-bites in the dental office.

UPON COMPLETING THIS COURSE, PARTICIPANTS WILL BE ABLE TO:

- Recognize and evaluate factors and conditions indicating a need for a posterior cross-bite treatment plan
- Understand the health practice potential of posterior cross-bite correction, as well as its importance to your patients' overall health, airway efficiency and final results
- Appreciate the necessity of a detailed patient examination and accurate history
- Discuss correctional treatment options and procedures with patients procedures with patients.



About the Author:
ROB VEIS, DDS.

Dr. Veis began practicing in 1984 as a solo general dentist and has been a part of both solo and group practices since then.

A graduate of USC Dental School, he taught for 12 years at the University of Southern California as a Clinical Professor in Restorative Dentistry; is an internationally renowned lecturer (at locations including UNLV, Columbia University, Loma Linda University and NYU) on the topics of Dental Sleep Medicine, Orthodontics for the General Practice and Appliance Therapy; and has served on the faculty of the Las Vegas Institute of Advanced Dental Studies.

He is the co-author of The Principles of Appliance Therapy for Adults and Children – considered one of the definitive texts on the subject – and has lectured extensively for the Academy of General Dentistry-sponsored mastership program.

AUTHOR DISCLOSURE:

Dr. Veis discloses that he is the CEO of SML™ Space Maintainers Laboratories.

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CONTENT:

A constricted maxillary arch must be corrected with arch development appliances to ensure that:

1. There will be adequate space in the upper arch to allow for the eruption of all the permanent teeth.
2. The palate expands and drops down. This will increase the size of the nasal cavity and encourage nasal breathing.
3. There will be normal muscle func-tion including good lip seal, normal tongue function, and normal swallow patterns.
4. The patient will have a broad smile.

A constricted maxillary arch can result in three types of malocclusions:

- A unilateral or bilateral posterior cross-bite
- A constricted maxillary and mandibular arch
- A constricted maxillary arch & retrognathic mandible

Unilateral or Bilateral Posterior Cross-Bites

When a patient has a constricted maxillary arch and a normal mandibular arch, we usually observe a unilateral cross-bite and a midline shift. Although the cross-bite appears to be unilateral, most posterior cross-bites are in reality a bilateral problem.

A unilateral posterior cross-bite is usually due to a bilaterally underdeveloped maxilla and a shifting of the mandible to one side during closure. If this situation is allowed to continue it will affect the TMJ negatively as one condyle becomes anteriorly displaced and the other posteriorly displaced. The anteriorly displaced condyle grows upward and backward and gets longer, and the posteriorly displaced condyle becomes flattened and shorter. This results in the two condyles being different in size and may lead to a permanent facial asymmetry.

Therefore, it is critical that cross-bites be corrected as early as possible in the deciduous or mixed dentition to eliminate facial asymmetry and future TMJ problems. It is not unusual to place a Maxillary Schwarz Appliance with posterior pads in a patient 4 to 6 years in age.



Constricted Maxillary and Mandibular Arch

When a patient has a constricted maxilla, it can often inhibit the normal development of the mandible as well. When this happens, it results in crowding and a lack of space for all the permanent teeth in both arches. A constricted maxilla and mandible may also result in speech problems due to lack of adequate room for the tongue.

The general practitioner can often prevent this crowding from occurring by simply utilizing a functional appliance like the Schwarz to develop the upper and lower arches in the mixed dentition. Expanding these narrow arches will also provide more space for the tongue. This helps to eliminate speech problems and encourages normal tongue function like swallowing. It also helps to prevent abnormal habits such as anterior or lateral tongue thrust.



Constricted Maxillary Arch & Retrognathic Mandible

When the maxilla is underdeveloped in a growing child, the mandible is often trapped in a retruded position. This occurs because it is the only position in which the teeth can stay in full intercuspation. In fact, an underdeveloped maxilla is one of the main causes of a Class II malocclusion.

This retruded mandibular position not only results in an extremely unfavorable profile but also places the condyles in a posterior position with a resultant increase in signs and symptoms of temporomandibular joint dysfunction.

The proper development of the max-illary arch with a Schwarz appliance allows the mandible to assume its correct position and allows the condyles to move downward and forward. It is critical for the health of the TMJ that the condyles be moved downward and forward away from the nerves and blood vessels in the bilaminar zone at the posterior part of the glenoid fossa. Clinicians who treat and monitor the health of the TMJ routinely find that the proper development of the maxillary arch is one of the main keys to TMJ health.

A properly sized maxillary arch is a prerequisite to the use of functional jaw orthopedic appliances such as the Twin Block which is used to advance the mandible in Class II skeletal cases where the mandible is retrognathic.

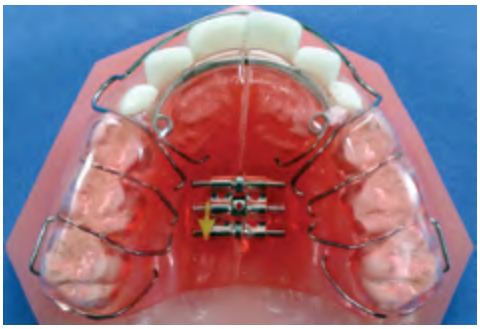
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Parents and patients alike much prefer the use of functional appliances such as the Twin Block, Rick-A-Nator or Herbst Appliance to advance the mandible non-surgically in mixed dentition, rather than delay treatment until the permanent dentition when some cases are treated surgically.

DESCRIPTION OF APPLIANCES:

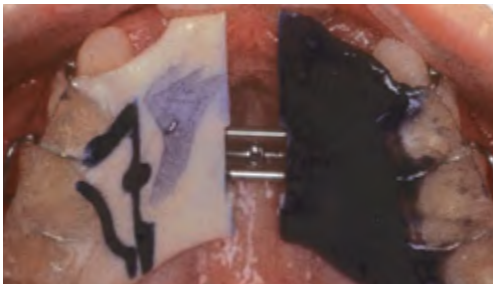
The typical Schwarz Appliance that is used in the mixed dentition to correct an underdeveloped maxilla consists of:

- Adams clasps on the adult first molars for retention.
- Adams clasps or C clasps on the primary molars for retention.
- A labial bow from cuspid to cuspid to control the labial position of the anteriors.
- A central palatal expansion screw to develop the arch laterally.
- Lap springs to align the anteriors.
- An acrylic palate to develop the arch laterally.
- Smooth acrylic posterior bite planes to allow the teeth to move free of occlusal interferences.



When used properly the Schwarz appliance can be used to effectively treat the following situations:

1. Correct a beginning skeletal Class II to a normal Class I relationship.
2. Reduce the overjet and overbite of the incisors.
3. Expand the upper arch into a normal buccal/lingual relationship with the lower.
4. Create normal space for the tongue allowing it to function normally.
5. Treat TMJ dysfunction.



TREATMENT PROCEDURES:

1. As always, proper appliance selection and application requires a good diagnosis and treatment plan. It is recommended that the following records be taken:

- Complete medical and dental history
- Periodontal records
- X-Rays (full series)
- Panorex
- Cephalometric X-Ray and Analysis
- Diagnostic Casts
- Photographs
- Airway Evaluation

Taking the time to obtain these records will also alert you to possible additional treatment that may be needed to assure that your patients receive the comprehensive care they deserve.

2. Once you have made your diagnosis and selected the appliance, take impressions for working models and a construction bite. Fill out a prescription slip and send everything wrapped very carefully to the lab.

3. Delivery of the appliance and follow-up care:

a. Make sure the appliance is made to your specifications and that it fits the working model.

b. Try the appliance in and check it for fit. If it is necessary, adjust any area that might cause a sore spot.

c. Adjust the clasps to hold the appliance securely.

d. Adjust the occlusal bite plane so there is equal contact throughout the posterior region. Premature contact can cause the patient to shift the bite abnormally. The mandible must also be free to move normally in anterior and lateral excursions without being restricted by any occlusal interferences.

e. It should be explained to the patient that the Schwarz Appliance is a 24-hours-a-day appliance. The patient is even to eat with it in place.

f. One week later, have the patient begin activating the expansion screw at a rate of two turns per week.

After the second week, evaluate the patient in one-month intervals. During these visits, check to see that the patient is adjusting the appliance regularly and watch for proper lateral development.

4. Once treatment is completed, i.e. the cross-bite is jumped, it is necessary to maintain the correction. This can best be accomplished by removing the occlusal bite plane off of the appliance with a stiff Robinson brush and then scalloping the acrylic around the teeth until there is a perfect fit. Once this is accomplished, the appliance can be worn as a retainer for the next 6 to 9 months.

5. Once you have corrected the patient's orthopedic (functional) problem, it can be determined whether he or she will need to continue with further treatment at a later date.



Early treatment gives a child a chance to grow normally. Notice the improvement in facial symmetry.

LAB REQUIREMENTS:

- **An accurate set of models** (a SML CE for FREE™ on Accurate Alginate Impressions is available from SMLglobal.com). It is essential to send both an upper and a lower cast.
- **An accurate construction bite.** It is important to check the completed construction bite by placing it back on the working models. Check the bite for proper midline, AP, and vertical correction and then carefully wrap the bite separately for shipment. Instructions on taking a construction bite are also available.
- **A complete prescription.** The Schwarz appliance is a very versatile appliance. It can be designed with many different clasps, springs, and expansion screws. So it is very important to give the lab your exact specifications.

ADJUSTMENT TIPS:

1. When the upper arch is extremely narrow and anteriors are labially positioned, it will be necessary to re-lieve the acrylic lingual to them to allow the anteriors to be retracted by the labial bow as the appliance is expanded.
2. As you expand the upper arch, it will be necessary to adjust the palatal acrylic on the appliance to allow the narrow high vaulted palate to drop. If this is not done, the appliance will simply not stay seated.
3. If you are using a primary molar for retention, sometimes it will be necessary to place composite buttons to create an undercut and use a C-clasp instead of an Adams clasp.
4. In late mixed dentition cases where the patient is actively exfoliating primary molars, appliance retention and comfort may become a problem. Therefore, it is always easier to treat during the earlier stages of mixed dentition.

CONTRA-INDICATIONS AND CONCERNS:

It is critical that clinicians understand the relationship between mouth breathing, airway problems and their detrimental effects on the size of the maxilla. During a normal swallow, as found with most nasal breathers, the tongue touches the roof of the mouth approximately 2,000 times per day and expands the maxillary arch.

With mouth breathers, the tongue drops down and does not exert its normal lateral pressure against the maxilla. The classic result is a decrease in the width of the maxilla due to the external forces of the buccinator and masseter muscles. For proper development of the maxillary arch there must be a balance of forces between the buccinator and masseter muscles externally and the tongue internally.

It is vital that the treating clinician, evaluate the child's breathing. It must be dealt with prior to the use of arch development appliances. Common airway problems include deviated septum, large turbinates, polyps or problems with enlarged adenoids or tonsils due to allergies or infections.

SUPPLY LIST:

Removable

- Acrylic Burs
- Acrylic Polishing Burs
- Acrylic Repair Kit
- Pressure Pot
- 139 Bird Beak Pliers
- Three Prong Pliers
- Wire Cutter
- Expansion Screw Key
- Stiff Robinson Brush
- Retainer Brite
- Sonic Appliance Cleaner
- Patient Appliance Care CD
- Patient Calendar Booklets
- Colored Retainer Cases

Fixed

- Band Biter
- Band Removing Plier
- Interproximal Stripping Tool
- Howe Plier
- Fluoride-Releasing Band Cement (Regular or Light Cure)

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