

Arch length problems

Summarized by Gerald Nelson

Treatment of arch length problems in the mixed dentition

It is hard to attend a major orthodontic meeting without hearing at least one presentation of a treatment method to reduce the number of extraction cases in your practice. Dr. James McNamara brought us some excellent ideas from his work at the University of Michigan.

Serial extraction was first reported in the 1930s. Removing first or second premolars typically provides substantially more space than the arch-length discrepancy requires. Natural drifting of the teeth hopefully takes up the slack. Some of the factors pointing to this procedure are an arch length discrepancy over 7 mm, thin labial tissue on the anterior teeth, and protrusively-inclined incisors. In other words, serial extraction is for seriously crowded cases.

Interproximal reduction is another method of gaining arch length, but it is rarely used in the mixed dentition. Reducing the mesial of the deciduous cuspids can provide a few millimeters for rotated incisors. Occasionally, the mesial and the distal of the

deciduous second molar can be stripped to take early advantage of leeway space. "When the lower second bicuspid are missing," Dr. McNamara said, "and you want to retain the deciduous second molars, reducing these molars to a normal mesial-distal premolar width will allow improved occlusion in the rest of the arch."

Orthopedic expansion

Orthopedic expansion highlighted Dr. McNamara's

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presentation. One of the diagnostic aids important to his evaluation is transpalatal width, measured from the lingual surfaces of the 6-year molars at the gingival margin. In the mixed dentition with average sized teeth the measurement should be 33 to 35 mm (according to research he did in 1989).

Dr. McNamara recommends a bonded rapid maxillary expansion device. He uses 3 mm thick Biocryl

Presented by James A. McNamara Jr., DDS, PhD
September 22, 1992 at the PCSO Annual Session in
Honolulu, Hawaii. Dr. McNamara is a Professor of Dentistry
in the Department of Orthodontics and Pediatric Dentistry,
University of Michigan.

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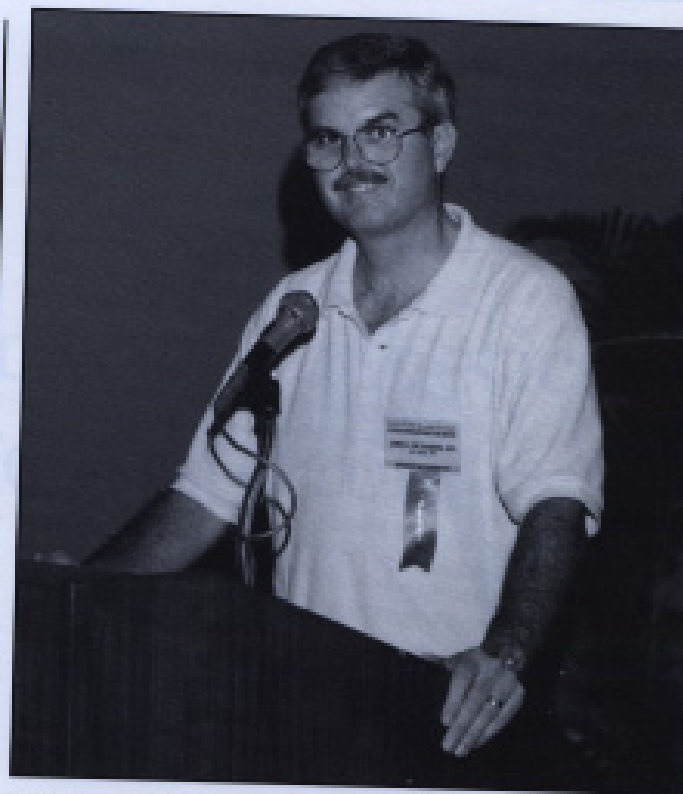
pads covering the posterior teeth connected to a Hyrax-type expansion screw. "Bond the appliance to the teeth with acid etch bonding material," he advises, "but don't etch the occlusal surfaces." His research showed that the bonded appliance causes the least dental tipping of any rapid expander. This is an important point because tipping in the molar area disturbs the occlusal table, introducing lingual cusp interferences. Tipping may also lead to more relapse of the upper jaw widening.

Compensatory arch expansion

Dr. McNamara also discussed research which notes a compensatory mandibular arch expansion which often accompanies maxillary orthopedic expansion. The most recent study is a prospective clinical trial, the first report of which is an unpublished University of Michigan master's thesis by E. W. Brust. Dr. McNamara uses this concept to support his own technique of expansion (he uses the term "decompensation") of the lower dental arch during the maxillary orthopedic expansion. He uses a removable acrylic appliance with a mini-jack screw in the midline (lower Schwarz appliance). "Easy, now," he cautions, "we're talking only 3 to 4 millimeters of canine width expansion in the mixed dentition." His clinical experience shows that this lower arch widening allows greater maxillary arch expansion, with better stability.

On the less traditional side, Dr. McNamara discussed the spontaneous correction of sagittal malocclusions, both Class II and Class III, in response to maxillary orthopedic widening.

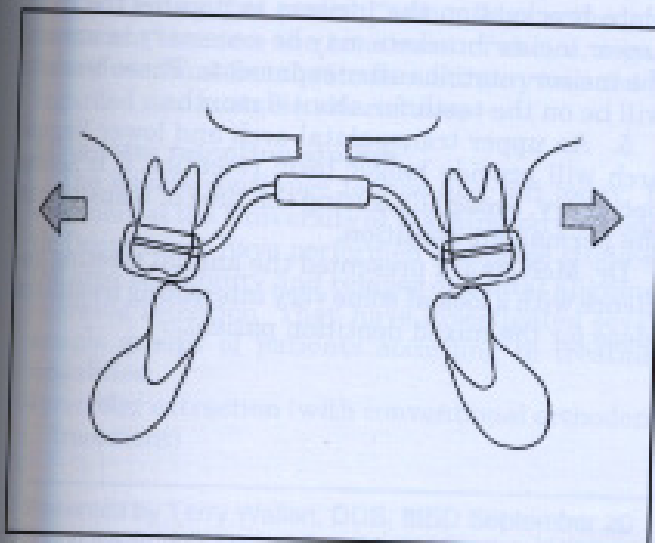
In the Class II patient, he often observes an improvement in the sagittal relationship within 6 to 12 months after expansion; however, he does not yet



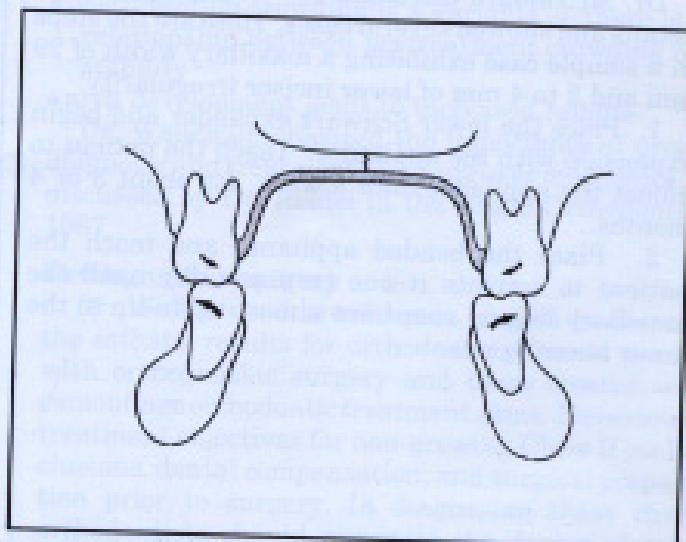
Dr. James A. McNamara

suggest a method to predict which patients will respond this way. He did speculate on the mechanisms at work, such as adaptive forward mandibular positioning. New information may come as a result of the current study.

In the Class III patient, an improvement in sagittal relationship is likely. The Class III patient has a completely different skeletal pattern, and the correc-

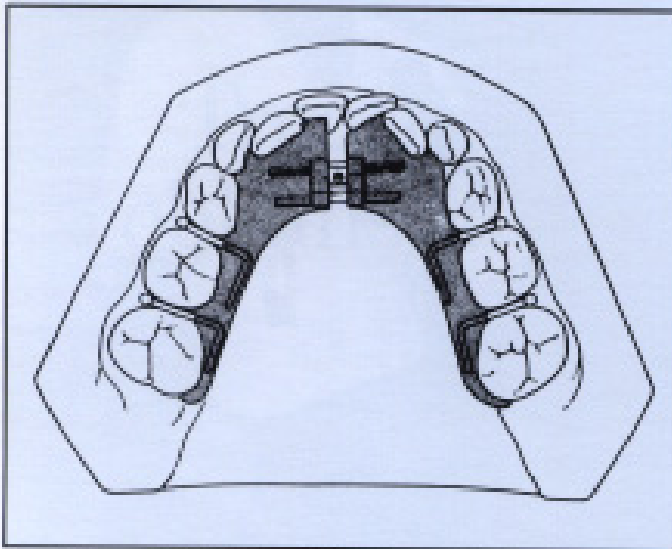


The acrylic splint RME appliance is bonded to the deciduous molars and maxillary first molars.



The effect of a bonded acrylic splint RME appliance. Note that the buccal cusps of the maxillary posterior teeth approximate the lingual cusp of the mandibular posterior teeth.

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Frontal cross-sectional view during the post-RME period. A removable palatal plate stabilizes the intra arch relationship. tion occurs for different reasons that are mechanical. That is, the mandible is propped open slightly due to the expansion, and point B moves distally as a result. Secondly, the maxilla tends to slip slightly forward during the expansion. Finally, the bonded expander can be constructed with hooks to receive forces from an orthopedic facial mask.

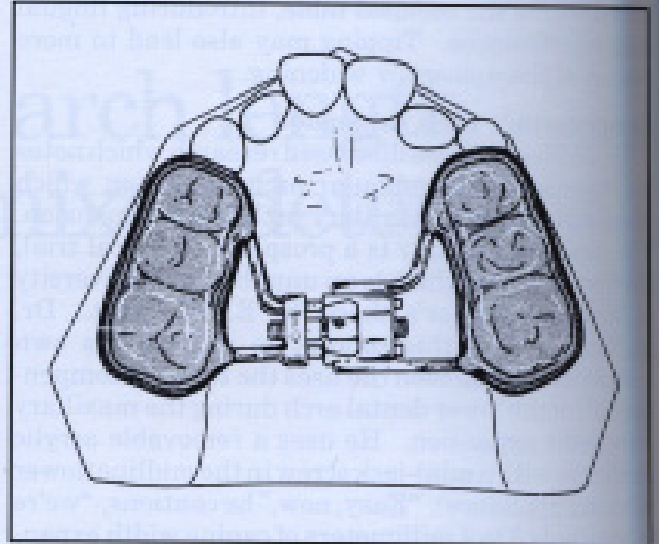
Treatment methods

Dr. McNamara discussed the treatment method details and showed several cases. Here are the steps in a sample case exhibiting a maxillary width of 29 mm and 3 to 4 mm of lower incisor irregularity:

1. Place the lower Schwarz expander and begin expansion with the appliance. Teach the patient to adjust the appliance once a week, for about 3 or 4 months.

2. Place the bonded appliance and teach the patient to activate it one turn per day until the maxillary lingual cusps are almost tip-to-tip to the lower buccal cusps.

3. Use the lower Schwarz as a passive retainer after expansion. Four or five months after activation of the upper bonded expander is discontinued, remove the appliance and place a palatal holding plate to stabilize until sutural anatomy normalizes.



The removable lower Schwarz appliance, used for mandibular dental decompression.

3. Use the lower Schwarz as a passive retainer after expansion. Four or five months after activation of the upper bonded expander is discontinued, remove the appliance and place a palatal holding plate to stabilize until sutural anatomy normalizes.

4. Substantial maxillary expansion will obviously create a large midline diastema, which will tend to spontaneously close with the central incisors tipping into the midline. If the amount of tip is excessive, place brackets on the incisors to parallel the roots. Lower incisor brackets may be necessary to unravel the incisor rotations after expansion. These brackets will be on the teeth for about 6 months.

5. An upper transpalatal arch and lower lingual arch will provide longer term retention if it seems necessary, especially during the time of transition to the permanent dentition.

Dr. McNamara presented the annual meeting audience with a look at some very interesting treatment ideas for the mixed dentition patient.◻