

## Expand Your Practice - Adult Expansion

By Lowry

# A

Adult patients now seem to have more time and money to spend on personal appearance and as a part of that are considering changes to their smiles. Many parents have invested in orthodontic care for their children and have seen impressive results. Often the impending loss or reduction of dental health benefits or an increase in disposable income prompts a desire to finally deal with their own dental concerns. It may be prosthetics, bleaching or “braces”. A dilemma that we as practitioners face is that the rules change for adults.

This article will focus on adult patients with a high palate and a posterior cross bite. In treating an adult, the traditional orthopedic appliances that we are familiar with don't work. Or do they?

### Background

The literature is replete with articles on surgically assisted expansion in adult patients but very few deal with a non-surgical approach.<sup>1</sup> A study by Knaup, Yildizhan, and Wehrbein published in 2004 looked at the ossification of the midpalatal suture in 22 subjects ranging from 18 to 63 years of age. The results were intriguing. The earliest ossification of the suture was in a 21-year-old male and the oldest subject without ossification was a 53-year-old male. They concluded that ossification of the midpalatal suture is not a valid reason for the increased transversal resistance encountered during rapid palatal expansion in younger subjects (<26 years) as well as in many older persons.<sup>2</sup> While this subject group was small, the results are worth considering.

In “Essentials of Facial Growth” by Hans and Enlow the process of bone remodeling is discussed in detail.<sup>3</sup> It is suggested in this text that sutural expansion is only a component of maxillary expansion and that even after fusion of the midpalatal suture it should be possible to expand the palate. There is also evidence that in some cases complete fusion of the palatal suture may never actually occur. Certainly, in addition to sutural expansion there will always be a component of remodeling which will affect associated structures

including the alveolar process in the upper arch. Bracketing the teeth will to some degree help control the rotation, tipping and drift that are associated with expansion and bone remodeling.

The need for expansion is traditionally in dolicocephalic patients with a high narrow palate, posterior cross bite, low tongue posture and lingually tipped teeth. The following are observations of the author but are consistent with the results. In dolicocephalic patients the palatal suture receives less stimulation from normal tongue function and these patients traditionally have less masticatory forces than mesocephalic or brachycephalic individuals. The result is less stimulation to the midpalatal suture which may decrease early ossification and therefore make this patient a better candidate for midpalatal sutural expansion. Further study in this area is certainly warranted.

### Case Presentations

#### Case One

A healthy 53-year-old female with a class II Div 1 malocclusion and bilateral posterior cross bite presented for a prosthetic evaluation. She was unhappy with her anterior esthetics. She had a constricted upper arch with crowded anterior teeth. After discussing treatment options with her, the decision was made to expand the upper arch. A hyrax type fixed maxillary rapid palatal expander was placed in conjunction with full bracketing. The patient was instructed to advance the appliance once a week and report any problems. Within a month the patient returned to report that she was doing well and the frequency of advancing the appliance was modified to twice a week. In four months the appliance had advanced to the full extent of the screw and more expansion was required. In order to complete the expansion the appliance was removed, the screw was reset and the appliance was adjusted to fit and reinserted. After six months of treatment the result was approximately 12 mm of expansion. The appliance was removed and orthodontic treatment proceeded.



Fig 1, 2, 3 - Photos taken March 2005 prior to insertion of RPE



Figure 4, 5 & 6 - Photos taken 3 months later (June 2005) after removing appliance, resetting screw and recementing the appliance.



Figure 7, 8 & 9 - Photos taken 5 months into treatment (August 2005) prior to removing the appliance.

Note the diastema between the central incisors at the end of the treatment, which typifies sutural expansion. Completion of the case will now allow for a successful prosthetic result.

### Case Two

A 36-year-old female with a Class II div. 1 malocclusion, a posterior cross bite, crowded teeth, a high narrow palate and missing maxillary 2<sup>nd</sup> bicuspids. She had no history of previous orthodontic treatment. She had no other medical or dental concerns. Her chief



Figure 10, 11 - Photos taken prior to insertion of the appliance Feb. 05

complaint was the crowded teeth. She also had a fixed hyrax type palatal expander placed in Feb. 05. She advanced the appliance 2 times per week and completed the expansion in June 05.

At the end of the expansion phase, the crossbite was corrected and the arch form improved. Approximately 8 mm of expansion was achieved.



Figure 12, 13 & 14 - Photos taken July 05 at the end of the expansion phase.

### Case Three

This last example is a 38-year-old female with a class II div 1 malocclusion with a 10% overbite and a 12 mm overjet. This patient had a posterior cross bite on the left and a high narrow palate. She previously had four bicuspids removed for orthodontic treatment. She also complained of TMD. Her symptoms included headaches, stiff neck, jaw pain on chewing and opening wide, tinnitus, pain around the eyes, clicking, and trouble sleeping. Again, a fixed hyrax palatal expander was used in conjunction with brackets.

At the end of the expansion phase the crossbite was corrected, the overjet had improved and the TMD symptoms were considerably reduced. Approximately 8 mm of expansion was achieved. Note the improvement in the overjet with no other treatment.



Figs. 15, 16 & 17 - Photos taken Sept. 05 prior to appliance insertion.



Figs. 18, 19, & 20 - Photos taken Nov. 05 at the end of the expansion phase.



Figure 21  
Figure 22

### Conclusion

In these three adult cases each patient was discouraged by the possibility of surgery to correct their malocclusion and was quite anxious to try a conservative approach. The anterior crowding was alleviated, the crossbites were corrected, the form of the maxillary arch was improved, and the integrity of the joint was maintained or improved. This type of conservative therapy is a great benefit to mature patients who are looking for the type of results that we are able to obtain for our younger patients. The benefits to our adult patients certainly merit consideration of this type of therapy as an option for treating these malocclusions.

1. Koudstaal, M.J. ; Poort, L.J. ; Van Der Wal, K.G.H. ; Wolvius, E.B. ; Pahl-Andersen, B. ; Schulten, A.J.M. : Surgically assisted rapid maxillary expansion (SARMS): a review of the literature. *International Journal of Oral and Maxillofacial Surgery*, Volume 34, Issue 7, October 2005, pages 709-714
2. Knaup, B. ; Yildizhan, F. ; Wehrbein, H. : Age-related changes in the midpalatal suture. A histomorphometric study. *J Orofacial Orthopedics*, 2004 Nov; 65(6): 467-74
3. Enlow, Donald H. ; Hans, Mark G. : *Essentials of Facial Growth*



figure 23



figure 27



figure 24



figure 28



figure 25



figure 29



figure 26



Fig 30



Fig. 33



Fig 31



Fig 32



Fig 34