Tooth positioning appliances: an orthodontist’s experience

By Barry Raphael, DMD

I’ve been actively involved with early treatment ever since I first saw Jim McNa­
mara in the early 1980s. Since that time, I’ve seen a lot of theories and “systems” come and go. As a specialist with a univer­sity training that taught me 14 different treatment styles (University of Pennsyl­vania, DMD, 1978, and Fairleigh Dickinson University, orthodontics, 1983), I’ve become accustomed to evaluating differ­ent ideas, both clinical and research-based and offer­ing my patients the best of all the options available. I keep my mind open to new ideas but I am always skeptical of the “quick fix” solutions to age-old problems. However, though I think research is the key to establishing a real understanding of issues, evidence-based dentistry or evidence-based ortho­dontics just cannot keep up with clinical innova­tions and, thus, our experience and judgment is tested on a daily basis.

For years, I wondered about the claims being made about tooth-guidance appli­ances and whether there really was a place for this type of appliance in my practice. I started to see things differently after seeking a solution to one of the many vex­ing problems I encounter with fixed ap­pliance therapy every single day: namely, closing open bites. It all started when I had a run of lateral open bites with tongue thrusts that resisted vertical elastics, spurs and everything else I could throw at them. You know the ones when you’re just about to finish up and the bite just won’t settle down. And getting these cases re­ferred out for the oral surgery they need doesn’t always happen. I now have a certi­fied oral myologist in my practice.

What caught my eye about tooth-guidance appliances when I first read about them was the fact that they were not solely aimed at influencing the teeth, but that they were focusing on the musculature.

Case 1

This patient presented in my practice at the age of 10 with severe crowding. Treat­ment involved the use of an upper Farrell Bent Wire System (BWS) combined with MRC’s Soft Pre-Orthodontic (1Tq) appli­ance (Figs. 1a, 1b).

The patient also took part in Trainer Ac­tivities to improve real habits. After a pe­riod of 11 months, the BWS was removed and the hard Tq was used. Treatment con­tinues and will use the Myobrace to finish the case (Figs. 2a, 2b).

Case 2

This patient entered my clinic at nine years of age with a Class II Division 1, bimaxil­lar.

About the author

DENNIS J. TARTAKOW, editor in chief of Ortho Tri­bune, practiced orthodontics, temporomandibular joint (TMJ) disorders and orofacial pain therapy in Palm Beach, Fla., and now resides in Marina del Rey, Calif. Tartakow is a consultant in orthodontics, TMJ disorders, orofacial pain, practice man­agement and health-care admin­istration. He coun­sels pre- and post­graduate students, orthodontists and health-care practitioners and has provided expert testimony in numerous orthodontic, TMJ and medical litigation cases. His professional accomplishments include being a dip­lomate of the American Board of Orthodontics, a diplomate of the American Board of Special Care Dentistry, and a certified dental editor. He is clinical associate professor and former director of the TMD section, postgraduate orthodontic department, Nova Southeastern University, College of Dental Medicine, Fort Lauderdale, Fla.; senior attending, postgraduate orthodontic section, Albert Einstein Medical Center, The Maxwell S. Fogel Department of Dental Medicine, Philadelphia, and clinical asso­ciate professor, orthodontic department, craniofa­cial sciences and therapeutics, University of South­ern California, School of Dentistry, Los Angeles; former primary adjunct professor, the Union Insti­tute and University, Graduate College, North Mi­ami Beach, Fla.; and Research Council member of the J. Paul Getty Research Institute and Library, Los Angeles.

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seldom are they cited in articles, refer­ence lists or bibliographic lists for self­ligating brackets.

As John F. Kennedy (1969) so adroitly stated, “A man may die, nations may rise and fall, but an idea lives on … we must appreciate for accessing and apply­ing the knowledge research provides and the value of research.

References


lary retrusion. She had a narrow maxillary arch, lip entrapment under the excess overjet, deep anterior overbite and crowding of the lower anterior teeth. She had a forward head posture with habitual open mouth posture. Facial muscles were overactive on swallowing. She also has a low maxillary frenum and a midline diastema (Figs. 3a,3b).

After one year of treatment with an upper and lower BWS (six and four months, respectively), an trainer (for three months) and an i2 trainer (for six months), the malocclusion and the soft tissue dysfunctions were corrected. The bi-maxillary retrusive skeletal pattern and profile remains at this point, though much growth remains (Figs. 4a,4b).

Case 3
This patient presented in my clinic at age 7 with an adequate arch form but a deep overbite. This is a perfect case to show how a little interceptive treatment can go a long way to solving problems that would be harder to correct later on (Figs. 5a,5b).

The Soft T4K was used for four months, followed by the Hard T4K for three months longer, at which point the overbite was resolved. The Hard T4K was used for seven more months, at which point less intensive use of the Hard T4K was prescribed. The T4K was used to assist 10 minutes of daily trainer activities to improve oral habits during a period of 18 months, after which the use of the T4K was discontinued. The patient still performs posture exercises for the long term (Figs. 6a,6b).

Correcting deep overbites with fixed appliances can be difficult, requiring bite planes or turbos along with full strap ups. This case was essentially solved in the first four months and continued to improve thereafter. No other treatment is anticipated.

Every orthodontist knows the musculature is influential on growth and development. For this, the evidence is clear. Angle knew it. Alfred Rogers knew it. Graber knew it and raised holy hell about it. Straub helped create a subspecialty around it. Harvold showed us how critical airway is. The same Proffit signed off on Tulloch’s work taught us about postural tongue position. Moss and Enlow showed us how it worked. Estuki Kondo’s “Muscle Wins” shows soft tissues and local factors to be critical in the development of malposition and malocclusion of the teeth.

‘Every orthodontist knows the musculature is influential on growth and development.’
The question that all these icons of our specialty raise is whether the soft tissues and skeletal structures of the mouth and face are indeed genetically determined, or if perhaps they are subject to the same environmental influences as all other tissues and muscles of our body (Björk 2002). Indeed, you can change the muscle mass of your legs in two weeks just by stressing it with weights. Likewise, two weeks prone in a hospital bed can render them weak. Why can’t the same apply to the muscles of the mouth?

We also know that bone responds to the forces that surround it, in both the functional and capsular matrices. The action in a hospital bed can render them weak. Likewise, two weeks prone your biceps in two weeks just by stressing it with weights. We also know that bone responds to the forces that surround it, in both the functional and capsular matrices.8 The action in a hospital bed can render them weak. Likewise, two weeks prone your biceps in two weeks just by stressing it with weights.


4) Straub, Walter, Malformation of the Tongue, AAO, 1960, 46(6), 404-424 (The first of 3 in- stallments).


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