

The Ortho Source



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Who We Are:

We are specialists that care deeply that our patients are treated to the highest level achievable. With a passion for excellence and the years of training to back it up, we work readily with our colleagues to create natural, life-changing smiles that are built to last for children and adults.

Highlights of this Issue:

- Dentofacial orthopedic treatment
- Phase I Orthodontic Treatment

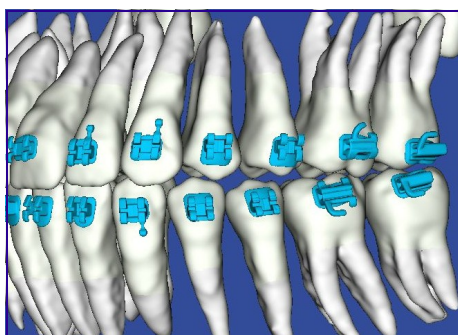


Figure 1: Handles for teeth. Though there are qualities that make some bracket systems better than others, brackets are merely an interface linking the energy contained in the arch wire to the teeth. Accurate bracket placement and precision wire bending is what really counts.

Dentofacial Orthopedics-It's Role in Orthodontics

"Facts are stubborn things."—John Adams. Our second president had it right. Facts are indeed stubborn things. Facts get in the way when anecdotes (or good salespeople) lead us astray. Facts, in dentistry, allow us to make good decisions when it comes time to recommend treatment to our patients. Facts allow us to make decisions that are evidence-based. Facts keep us on the right path.

In orthodontics, we are in the midst of a conflict. On one side are facts, stubborn by nature and void of favoritism. On the other side are anecdotes, opinions, and yes, salesmanship. Supply companies and their representatives are visiting our offices and telling us that their appliances can do things that defy years of research and fact. They are telling us that their braces are "magical" or different in some way.

The facts tell us that the bone is the medium in which the teeth reside and therefore move. Management of the bone is what allows orthodontists to be effective in tooth movement. Healthy bone is mandatory if we are to move the teeth into a good position that allows for a good occlusion, a healthy periodontium, alignment, and stability. But, there are different kinds of bone that we need to be

expert in managing. The teeth move around inside the alveolar bone. Apical to the alveolar bone is the basal bone or skeletal bone.

Skeletal bone management is the role of orthopedics. Many years ago, the orthodontic profession realized that this additional term more accurately described our field. The decision was made by our leadership to add the term "orthopedics" to the specialty's name. "Orthodontics and Dentofacial Orthopedics" is in fact the specialty's official name. Our society's flagship periodical is titled "The American Journal of Orthodontics and Dentofacial Orthopedics". Orthodontists have the ability to effect the very nature of the bone that surrounds the teeth and the

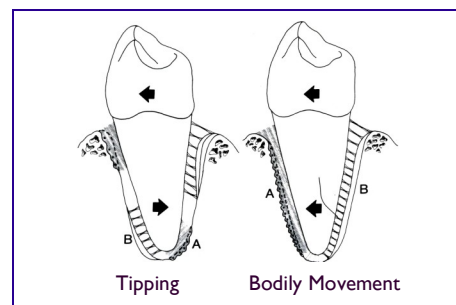


Figure 2: Clinical tooth movement requires a PDL. Forces applied to teeth are mediated through the PDL and result in remodeling of the periodontal tissues. When light continuous force via a wire is applied, teeth move efficiently through the bone to the desired endpoint.

bone that makes up our facial complex. Affecting the bone is no small thing. Our smiles, our children's faces, tooth alignment, occlusion, periodontal health and stability—the bone is the key to all of these things being healthy and long lasting.

So, are braces “orthopedic” tools? Braces, in the purest sense, are handles. We attach them to the teeth to allow us to get a good grip so we can move the tooth from here to there. Braces are to teeth what knobs are to doors. Without an attachment, something to grab onto, it will be difficult to open that door—or move that tooth (**Figure 1**). And moving a tooth is really quite an amazing thing. What other examples exist in nature that are similar? The periodontal ligament is that unique biologic feature that allows us to move a tooth. Osteoclasts and osteoblasts become activated when the PDL has pressure applied to it. Teeth can be moved effectively in every dimension with a

good handle attached to them. Bone is created and destroyed as a tooth moves—like a boat in the water. (**Figure 2**).

It's not just about moving teeth. The specialty of Orthodontics and Dentofacial Orthopedics has evolved into identifying and treating skeletal issues AND moving teeth to their ideal positions. In many cases, depending on the timing, it's not an either/or thing. Many patients we meet require both orthopedic AND orthodontic treatments. Importantly, the tools that we use to accomplish our goals need to be appropriate for the job. Why use a screw driver when a hammer is required? Why use braces (doorknobs for teeth) when we really need an expander (an orthopedic tool that effects basal bone) (**Study figures 3-7**).

Therein lies the conflict that is affecting our profession. Orthodontists are being told by salespeople that braces can have an orthopedic

effect. One company in particular—Ormco, maker of the Damon Appliance System, has been going directly to the public with their advertising message and some orthodontists are drinking the Kool Aid. Ormco is even convincing patients to ask for the Damon System by name. As a result, orthodontists are responding by offering a door knob to do an orthopedic job. It can't be done. (**Figure 8**).

Self-ligating brackets—braces that have the ligation built in to the bracket instead of having to manually tie in the wire—have been around for a long, long time. Many of the first braces ever used in modern times were simple self-ligating systems that had the orthodontist thread a flexible gold wire through an eyelet that was attached to a tooth. There is nothing NEW about self-ligating brackets! **There is no new research that shows that self-ligating brackets (Damon, Speed, TIME, InOvation, and a host of others) can have an orthopedic effect on skeletal bones.** We need a different tool for that. We intentionally want to bypass the PDL, and go straight to the growth centers of our skeletal bones.

Where do those growth centers reside? In the mandible, the growth centers are at the condyles, just like the other long bones in our body. The mandible also grows by apposi-



Figures 3,4: This 13.1 yo patient had a skeletally deficient maxilla in the transverse and A-P dimensions among other issues such as skeletal open bite and linguoverted mandibular teeth. Obvious cross bite and lack of anterior coupling predisposes to wear.



Figures 5,6: A rapid palatal expander (RPE) was used to efficiently increase transverse dimension in the maxilla orthopedically. A reverse-pull facemask was used to develop the A-P dimension, not only creating overjet, but truly improving facial convexity.

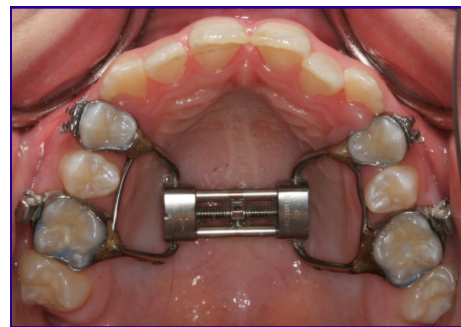


Figure 7: An RPE applies a stronger force to the maxillary suture, distracting the two halves and allowing new bone to fill in the gap. Notice that the teeth were not tipped facially, but served as anchors to open the suture. Front teeth migrated into the gap.

tion as layer upon layer is added to increase its diameter and thickness. The mandible is known to be stubborn, just like facts. The mandible is pre-determined genetically to be the size and shape that was created at conception. Without surgery, trauma or hormonal mechanisms, orthodontists are not able to effect the size or shape of the mandible. Our tools for that are limited to what we can do with the teeth and specifically the alveolar bone that supports the teeth. Orthodontists are responsible for molding the alveolar bone to the size and shape that fits the mandible and also allows the teeth to be well aligned and level. We move the teeth, and the alveolar bone follows—within limits.

In the lower arch, it is necessary to properly diagnose the case, specifically by studying the eruption process and where it has gone wrong. It may be necessary to tip the teeth out slowly and gently and allow the alveolar bone to follow the teeth on their path to a wider arch form. In this way, lower arch expansion is very predictable and practical. Matching the eruption process to the patient's genetic potential for growth is the goal. Many times, the teeth erupt first, before the underlying bone structure has had a chance to catch up.

With arch expansion and then retention, we are buying time for the mandible to grow.

There are many appliances that can expand the lower arch effectively (Schwartz, Lip Bumper, Lingual arches, brackets and wires to name a few).

Waiting until the permanent teeth are fully erupted before any lower arch expansion is attempted is improper as gingival attachment issues, occlusal wear and tear, and functional shifts are occurring during the mixed dentition. Intercepting these eruption problems is the reason why we like to evaluate our patients by age 7. Prevention and timing- is the key if we are to apply our tools successfully.

Treating the mandible is a totally different process than how we affect the bone of the maxilla.

In the maxilla, we have sutures. Sutures are also present in the mature skull. As dentists we all memorized their names and locations for anatomy class. Sutures are the growth centers of these very specialized bones. Well...good news, orthodontists can effect sutures!! And so can pediatricians who “round out” the flat spots in some newborns’ heads. Neurosurgeons and plastic surgeons who separate conjoined twins can too. Sutures are an orthodontist’s friend. Our favorite one happens to be the mid-palatal suture.

Haas first described maxillary expansion in the literature in the early 1960’s. * His work at the time was considered radical as orthodontists held on to their favorite tools for straightening teeth (brackets and wires). Would it be stable? Will the bone dissolve or collapse? Will the patient be in pain? All of these questions and hundreds more have been answered over and over in the literature and in practice. Haas could easily be described as the modern father of dentofacial orthopedics, and his seminal work led the way for today's practice of orthodontics and

dentofacial orthopedics. Other researchers followed to confirm and expand on his findings.** Additionally, new as yet unpublished research utilizing cone beam CT 3D scanning technology confirms the long held belief of the difference between dental “tipping” and true bony expansion. Haas was correct!!

For true sutural expansion, forces must be applied to the mid-palatal suture. This is most effectively accomplished with orthopedic forces delivered by a fixed device in the palate. Tipping of teeth is easily accomplished with brackets and wires, but expecting these light forces to transfer to the midline suture via the PDL is impractical at best and at worst incompetent when sutural expansion is required (**Figure 7**).

There are now over 50 years of studies proving the effectiveness of interceptive care and the concept of phase one orthodontics— specifically upper and lower arch expansion. While kids are still growing is the correct time to use our orthopedic tools. The American Association of Orthodontists has long espoused the benefit of referring patients for their first consultation at age seven or sooner if a specific problem is presented. The clear message is that a well-trained and modern orthodontic practice has the best chance at orthopedic correction while the patient is still young and growing. This message is not cloaked in sales pitches or magic, but in facts. And facts are indeed stubborn things.

—Dr John Wise



Figure 8: Despite quality research to the contrary, Damon bracket users still claim that this bracket is THE tool for a multitude of orthodontic problems. The fact is that Damon brackets offer no advantage in speeding treatment time, and are useless when orthopedic development of the basal bone is required. *Angle Orthod.* 2006 May;76(3):480-5

References—

*Haas AJ. Rapid expansion of the maxillary dental arch and nasal cavity by opening the midpalatal suture. *Angle Orthodontist* (1961) 31:73-90.
 *Haas AJ. Palatal expansion: Just the beginning of dentofacial orthopedics. *AJODO.* (1970) 57:219-255.
 **McNamara JA, Brudon WL. Orthodontic and orthopedic treatment in the mixed dentition. (1993) Ann Arbor: Needham Press.
 **O’Grady, McNamara et al. A long term evaluation of the mandibular Schwartz appliance and the acrylic splint expander in early mixed dentition patients. Volume 130, Issue 2; *AJODO* Aug 2006.

We hope that this quarterly publication will serve as insight into the various questions you might have regarding orthodontics. We will touch on different topics, providing "pearls" that enhance your understanding of what orthodontic tools are available and what we can achieve when working together as colleagues in dentistry.

Announcement!

Case Discussion Meeting: All are invited. Bring cases in hand or on powerpoint, and questions or thoughts on any aspect of dentistry. Let's hang like a gang and learn together! **Meeting is held every 2nd Thursday of the month at:**



6850 TPC Dr Suite 110
McKinney, TX 75070
(972) 678-0127

Dates: August 11th
September 8th
October 13th
November 10th
December 8th

All patients shown or treated are actual patients of Dr Doug Jensen or Dr John Wise.

Phase I Orthodontic Treatment

Please take a look at the following pictures. As you know, orthodontists assess the face and dentition in three planes of space, as well as perform a tooth by tooth exam. This is to help determine what, if anything, has gotten off track during the eruption process. Some problems are obvious, others are less conspicuous. In young children we primarily look for big picture deviations such as transverse constriction, midline asymmetry, crossbite, and deep or open bites. Refer to the table below for other assessments made during a typical orthodontic exam.



Unilateral cross bite with midline deviation: A common transverse developmental problem which predictably responds to orthopedic force

Angle class III A/P, vertical, max/mand transverse problems: Can be efficiently treated with early orthopedic force and incisor alignment



Habit-related maxillary transverse and vertical problems: Responds well to early sutural expansion and incisor extrusion



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| Transverse Dimension | Facial Asymmetry, CR/MIP Shifts, Dental/Facial Midline Shifts, Anterior Diastema, Posterior Cross Bites, Habits |
| A/P Dimension | Abnormal Profile, A/P Functional Shift, Class 2/3 Molar and Canine, Overjet, Anterior Cross Bite |
| Vertical Dimension | Disproportions of the Face Height, Low or High Mandibular Plane Angle, Open Bite, Deep Bite, Infra/Supra Erupted Teeth, Deep Curve of Spee, Habits |
| Alignment/Symmetry | Arch Coordination Misfit, Asymmetry, Spacing/Crowding, Missing Teeth, Rotations, Tooth Wear, Bruxism |