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THE EDITOR'S CORNER

The Problem in Orthodontics

There are few circumstances more frustrating in any orthodontic practice than the all-too-common situation in which a patient whose case was finished successfully a few months earlier shows up one day, and some hard-won aspect of the correction has relapsed. The lower anteriors may have become crowded, a previously closed open bite may have reopened, or perhaps a stubborn upper midline diastema that was completely resolved at the end of treatment may have reappeared, seemingly overnight. The patient or parents invariably hold the doctor to blame.

Relapse haunts us all. Dr. Albin Oppenheim, one of the great figures of the early days of orthodontics, was quoted as saying, "Retention is one of the most difficult problems in orthodontia; in fact, it is *The* Problem." I don't know of a single practicing orthodontist who would disagree with him. The subject has been approached from a variety of perspectives, which Joondeph has succinctly described as the four orthodontic schools of thought.* The Occlusion School sees the final occlusion as the most potent factor in determining long-term stability. Norman Kingsley was the strongest proponent of this philosophy, which held sway in the early part of the 20th century. To the Apical Base School, as expounded by Axel Lundstrom and his disciples around 1925, maintenance of the intercanine and intermolar widths at pretreatment dimensions is of paramount importance. The Mandibular Incisor School, whose most famous advocate was Charles Tweed, holds that positioning the lower incisors "upright over basal bone" is the single most important factor. The Musculature School considers proper function and muscle balance to be the ultimate determinants.

Like most physiologic phenomena, however, orthodontic stability is multifactorial. The degree of influence of each factor championed by the different schools of thought varies from patient to patient, and even from one time to another within an individual case. Oppenheim's message remains as pertinent today as it was in the

*In Graber, T.M. and Vanarsdall, R.L.: *Orthodontics: Current Principles and Techniques*, 3rd ed., Mosby, St. Louis, 2000, pp. 985-986.

Roaring Twenties—retention is *The* Problem in orthodontics.

The question is actually a simple one: How do we keep the teeth where we put them during treatment? Perhaps the soundest advice I've heard came from the chair of the orthodontic program in which I trained, Dr. Daniel Subtelny of the Eastman Dental Center in Rochester, New York. Typical of his brand of folk wisdom, Dr. Subtelny used to admonish me and my classmates, "Let the punishment fit the crime." In other words, build a mechanism into the retainer to treat the original features of the malocclusion. Since each case is unique, each retainer is unique. This has been termed the Differential Retention Principle.

For example, in a Class II case, the lower incisors should be permanently retained if they have been moved forward more than 2mm during treatment. To prevent or control skeletal relapse, night-time wear of a Kloehn-type headgear or functional appliance is indicated. For a severe initial Class II problem or a young patient with considerable active growth remaining, it is assumed that an anteroposterior relapse tendency exists, and that a 1-2mm change in sagittal relationships should be addressed in retention with ongoing Class II elastics and overcorrection. In a Class III case, it is recognized that skeletal relapse results from continuing growth of the mandible and thus will be difficult to control. Although restraining forces applied to the mandible, such as chin cups, have never been proven effective in any evidence-based investigation, they remain at the top of our list of non-surgical options for moderate-to-severe cases. In a mild Class III patient, a functional appliance or positioner is generally able to maintain the occlusal relationships during post-treatment growth.

Vertical problems can be addressed under the same philosophy. In a deep-bite case, a removable maxillary retainer with a built-in bite plate can prevent post-treatment closure. Likewise, a high-angle anterior open bite can best be retained by building posterior bite blocks into a removable maxillary retainer and applying a high-pull headgear at night to control molar eruption.

An unscientific review of my own practice indicates that for me, at least, lower incisor crowding is the most common reason for patients to seek care for orthodontic relapse. A number of authors have suggested explanations for this vexing phenomenon over the years. To summarize the various theories about the etiology of lower incisor crowding relapse: Late mandibular growth results in a forward or downward rotation of the mandible, which carries the incisors into the lip and its underlying musculature. This produces a force acting to tip the incisors distally, which ultimately results in incisor crowding. The implied corollary to the hypothesis is that lower incisor positions should be maintained until the rate of mandibular growth declines to adult levels.

As with so many other problems in orthodontics, patient cooperation becomes a limiting factor. Fortunately, we have a relatively simple and inexpensive solution in the fixed lower retainer. Most of the customization needed to satisfy Dr. Subtelny's "let the punishment fit the crime" dictum can be built into the acrylic of an upper wraparound Hawley-type appliance, while the fixed lower lingual retainer can be worn without loss or failure until well into the adult years.

The overwhelming popularity of the fixed lower retainer is emphasized by the number of modifications that appear in print every year. Banded 6-6 or 3-3 designs, bonded 3-3s, wrought wires, braided wires, semicircular wires, monofilaments, and pliable fibers have all been tried. Each of these concepts has its pluses and minuses, its supporters and its critics. In this issue, we present four new variations on the theme, each of which holds promise as a valuable addition to the armamentarium of a busy practice. Still, despite the plethora of new ideas for addressing relapse that keep springing up, I suspect that *The* Problem will be with us for years to come.

RGK