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THE EDITOR'S CORNER

Common Sense Revisited

A fundamental understanding of biomechanics is one of the hallmarks of a specialty education in orthodontics. The interrelationship of force magnitudes, force vectors, and moments underpins most of what we do as clinicians. Considerable progress has been made over the years in making the application of desirable forces and moments inherent in the design of orthodontic appliance systems—so much so, in fact, that there is a tendency on the part of many practitioners, myself included, to become over-reliant on the appliances for delivery of the appropriate forces and moments, without much mental or physical input from us. Indeed, most of us eventually develop treatment protocols that are almost automatically applied whenever a given diagnosis presents itself. While there is nothing inherently wrong with the development of such scenario-based treatment plans, if we sit back and look closely at what we are doing and, more important, *why* we are doing it, a more effective treatment option may well become evident.

One of the most common mistakes that arises as a result of standardized treatment protocols is the tendency to place full appliances in every single case. Not only is this unnecessary in many patients, but if we analyze the resulting force systems, it may actually be contraindicated. When an appliance with brackets or bands on every single tooth is applied in one sitting, the dentition is subjected to a complex force system all at once. It is almost impossible to fully understand the forces being applied to all the teeth; in reality, the more complex the force system, the more likely it is that we *cannot* predict or control all the forces to which the dentition is subjected. Unintentional and, in many cases, undesirable tooth movements can result. A much simpler force system—in other words, a much more understandable and, thus, more predictable force system—can be achieved by applying brackets or bands to selected teeth to bring about specific tooth movements in a logical and orderly sequence, thus avoiding the unnecessary side effects of treatment that can result from poorly understood mechanics.

Over the years, a number of prominent authors, including Burstone, Nanda, and Ricketts, have proclaimed the virtues of segmental mechanics. Typically, separate force systems are applied to the incisors, by means of an archwire anchored at the first molars, bypassing the premolars and canines; and to the buccal segments, using segmental archwires. In Class II deep-bite cases, the anterior wire aligns the incisors through intrusion and retraction. Once the teeth in the individual segments have been aligned and the vertical and sagittal corrections have been made, the arches are consolidated, and finishing is accomplished with a comprehensive archwire.

Unfortunately, the segmental approach to biomechanics has been perceived as overly complex, and, as a result, many practitioners have been reluctant to try it. Dr. Thomas Mulligan recognized this misconception long ago and set out to prove it wrong in his first book, *Common Sense Mechanics*, which has since become a classic in the orthodontic literature. His explanations of complex force systems and balancing moments are presented in a way that seems, as the title implies, like simple common sense. This book was serialized in JCO in 1979 and 1980, and it proved to be one of the most popular collections

of articles in the history of the journal. But Dr. Mulligan has not rested on his laurels; his follow-up books, including *Common Sense Mechanics in Everyday Orthodontics II*, continue to enlighten the profession.

In this issue of JCO—three decades after the original book was published—we present a condensed version of a chapter from his latest text, dealing with one of the most difficult force systems to understand: differential moments. Once again, Dr. Mulligan has taken complex theoretical constructs and boiled them down to common-sense concepts, facilitating their ready application. I look forward to incorporating these principles into my daily practice. RGK
