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Mini Review

What is Truly Terminal about Centric Relation

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Abstract

Management of TMD is a controversial subject and is often based on the philosophy of the importance of centric relation. This article is an opinion piece, based on over 3 decades of clinical experience in successful occlusal bite rehabilitation and TMD management, based purely on occlusal and neuromuscular principles, while refuting the perceived value of the centric relation philosophy, which is still taught in the majority of North American dental schools.

Keywords: TMD; Centric Relation; SAM

Having been in practice for almost 40 years has made many of my dental school memories foggy, to say the least. Some are vivid to this day. One of them is the first time the concept of centric relation was explained to me. I remember my first thought was 'you're kidding'. As I retruded my own mandible, and imagined how uncomfortable a bite position coincident with that position would be. I rationalized the concept, at that time, by deciding that I must not really understand it.

The position we were seeking then was the rearmost, uppermost, midmost (RUM) position of the condyle in the glenoid fossa. It was to be found by bimanually manipulating the mandible into position. We referred to this as 'shoving the jaw back'. Contemporary definitions of centric relation (there are at least 27 definitions in the scientific literature) suggest a more antero-superior (SAM) position. Proponents of the technique refer to 'romancing' the mandible into this position.

As a dental student, I knew that I had to embrace the CR philosophy if I were to expect a passing grade in prosthodontics, but I also knew that I would pay little attention to it in clinical practice until I had embraced a more profound understanding of its nuances.

In dental school I also remember being taught that there were many types of TMJ disorders, but that the primary cause was psychosocial. There were many detailed parameters discussed to enable us to classify the specific disorder the patient was presenting with that we were forced to commit to memory, but regardless of the classification, the treatment was always the same. Splints and muscle relaxant therapy with medications, or some type of physical therapy. The idea was to offer conservative symptomatic treatment until the problem (or the patient) just went away. This probably doesn't accurately represent the depth of what I was taught, but it's what I recall taking with me into practice.

I coasted along for a decade or so paying little or no attention at all to any bite position other than the one the patient presented with. I cared little about occlusion or TMD other than what I'd learned in school, and cared even less about learning anything more. I was busy expanding my knowledge of fixed orthodontics at the time. The only discussion of occlusion entering into that training was to strive to achieve cuspid rise, class I molars and no balancing interferences. Little or no attention was paid to the mandibular position in relation to the base of the skull. No attention was paid to the airway at all.

The first big change in the direction of my career took place after my first decade. I was shocked to learn that everything I'd been taught about never putting phosphoric acid on dentin was wrong. It made me begin to seriously question everything I thought I knew, including the concept of centric relation.

I immersed myself in learning about occlusion. I took every course and explored every philosophy I could find. A decade later, my thinking finally crystallized into the realization that no philosophy was going to offer the key to foolproof therapy for occlusal disease, but that, without a doubt, manipulating mandibles into centric relation was without merit, and that there was an indisputable link between airway, occlusal parafunction and TMD [1-5].

This realization was the result of hours of study. Time and again I felt like a flag blowing in a breeze. One day I'd be convinced I'd found the key to occlusion, then the next I'd learn something else to shatter that newfound belief, just like a change in the direction of the wind. The wind finally eased up when I discovered neuromuscular dentistry and the aetiological importance of the airway, and closed the door on manipulating mandibles into centric relation forever.

I am not alone. To quote Dr. Robert G. Keim, Director of Postdoctoral Orthodontics at U.S.C. "I would suggest that the term CR has become obsolete. Like the mythical Shangri-La, it is a wonderful, magical place where all problems are solved – but does not exist in physical reality. If we as clinicians continue to place emphasis on establishing "harmony" between CO and some mythical concepts of CR, we are doing ourselves a disservice" [6].

There is no place for airway-impinging dental therapeutics in dental practice in 2017. There is no scientific support for centric relation therapy [7-12]. There is no terminal hinge axis [13-15]. Fully adjustable articulators do not mimic the movement of the mandible of any human [13]. Manipulating mandibles into centric relation should no longer be taught in dental school at any level, other than perhaps for historical reference. It is no longer acceptable for orthodontists to retrude mandibles, or to provide treatment without a clear occlusal goal in mind that is neuromuscularly balanced and which takes into consideration airway, and the harmonious interaction of teeth, bones, muscles (posture and function), TM joints, the periodontium, and the concept of minimal invasiveness. It is no longer acceptable to ignore airway problems in children. It is no longer ethical to accept a 50% success rate in the management of TMD owing to the misguided belief in a psychosocial cause rather than a biomechanical one.

These changes will not come quickly or easily. They will meet with tremendous resistance, but they are inevitable, and clearly, it is not typically in the domain of a general dentist in private practice to put forth this opinion, but I believe science will ultimately triumph over politics or personal bias. The sooner the better, but I can wait. If nothing else, I'm a realist. Max Planck was a realist who postulated quantum theory. In his opinion "A new scientific truth does not triumph by convincing its opponents and making them see the light, but rather because its opponents eventually die, and a new generation grows up that is familiar with it". I can wait. But, our patients can't.

Airway is King

It is known that facial growth and development is abnormal if the child does not have proper oral posture including nasal breathing, lip competence, lips and teeth together during swallowing and resting position of the tongue against the palate. It is the growth of the tongue that stimulates the maxilla to grow in size. If the tongue isn't in place against the palate, as in mouth breathing, the maxilla becomes narrow and the mandible is forced to fit into a smaller arch and must retrude, unless the patient has a predisposition to mandibular prognathism (approximately 3% of cases) in which case a posterior and anterior crossbite often occurs.

Classic approaches to occlusal rehabilitation and orthodontics involving the distalization of the mandible leads to a further impingement on the airway and is physiologically aggravating. In summary, the aetiology of orthodontic problems is primarily environmental. With proper oral posture, even those predisposed to being class II or class III can realize facial balance and achieve their genetic potential.

Conclusion

This document was inspired by the efforts of Dr. Charles Greene to impose his archaic AADR TMD guidelines on dentistry. In my opinion, his unpublished goal is to protect traditional orthodontic methods, not to help patients.

Those guidelines, which specify only employing reversible techniques, have no scientific support, in spite of his efforts to suggest otherwise, and are based on having carefully dissected the literature to help make his case, while completely ignoring the vast number of studies in support of exactly the opposite philosophy. Forbidding dentists from advancing the mandible, or perhaps more aptly put, preventing them from allowing the mandible to settle into a position that supports respiration, TM joint comfort, function and health, is unsupportable logically, scientifically, legally or ethically.

One only has to restore cuspid rise in 5 or 6 TMD patients to realize the therapeutic value of changing the occlusion. This muscle calming technique can easily, painlessly, reversibly and inexpensively be achieved with composite. You can expect to quickly be convinced of the fallacy of the psychosocial approach when this simple biomechanical change will provide rapid pain relief for many patients.

I invite all of the sceptics to revisit the concept of centric relation and articulator based reconstruction from the point of view of the patient. If after occlusal rehabilitation treatment has been completed using these methods the patient requires occlusal adjustments, and is still in pain, and requires a nocturnal appliance, could it be that the approach is flawed?

I invite all of the sceptics to revisit the psychosocial model of treatment for TMD from the point of view of the patient. If conservative, non-invasive and reversible treatment isn't working, perhaps there's a better way other than to simply medicate these people and tell them to wait and see.

And finally I invite all of the sceptics to revisit the concept of retraction-based orthodontics as it relates to airway-impingement. Insufficient airway is the cause of almost all orthodontic problems (with syndromic patients being the extremely rare exception), how does it make sense to compound the problem by decreasing the airway even further?

It is no longer enough to simply defend the philosophy of airway protection and enhancement as a central theme in neuromuscular dental techniques in articles such as this. Rather, it is necessary to attack the dental school curricula that continue to propagate misguided treatment choices that ultimately cause harm.

We are the front line health care providers that these patients not only depend on for help, but that also depend on us to do no harm. It is time for a new paradigm.

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