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Perspective

US TMJ Philosophies: A History and Perspective

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"It ain't what we don't know that's the problem. The problem is what we think we know as fact but AIN'T".

Mark Twain

Depending on what decade a current U.S. dentist graduated, their personal Temporalmandibular joint and occlusal philosophy has probably evolved radically from their dental school occlusion course. Every current practicing dentist has probably encountered an enlightening continuation course that opens new horizons to him or her that totally changes what was previously accepted as fact. These courses are very affecting and a new zeal fills the practitioner that opens whole new horizons intellectually, emotionally, and financially that border on religious and installs a feeling of ownership to this new philosophy and to that philosophy's corresponding dental organization or institute. It is the purpose of these courses to indoctrinate practitioners how to establish proper occlusion, to eliminate predisposing factors which cause TMD (Temporal Mandibular Joint Dysfunction) and how to treat acute TMD.

This zeal is so profound that whenever a journal article or dental magazine treads on the subject, a flood of mail mostly hostile to the author's presentation assaults that journal's mail room for months thereafter. For 40 or more years, this debate has raged in dentistry. No other issue in dentistry is as hot button and controversial. This ongoing debate however, is the foundation upon which we must build our cases. It is the purpose of this article to present the historical nature of these philosophies and summarize the divisive nature of current U.S. occlusal and TMJ trains of thought.

"The greatest hindrance to my learning was my education".

Albert Einstein

Centric Relation

In the last 60 years, Centric Relation has had a storied and controversial legacy in dentistry. The majority of dentists in America have been trained to execute various techniques of mandibular manipulation to achieve Centric Relation. My textbook in the 70's, *Mouth Rehabilitation* by Kornfield, described Centric Relation (CR) as the rear most midmost translated hinged position. "It is the only maxillomandibular relationship that can be statistically repeated. It is a strained position".

Ramfjord, in the early 1960s, discovered that all of his acute Temporalmandibular Dysfunction patients displayed a slide from manipulated Centric Relation to Centric Occlusion (CO). Ramfjord, a Periodontist by training, was arguably the most renowned dental clinician of his era. CR was now scientifically proven to be the terminal hinge position where healthy joints functioned. Deviation from CR by inclined contacts between occluding teeth would slide the mandible protrusively unseating the condyles into a potentially harmful joint position. However, Ramfjord failed to test a control group of healthy subjects. If he had, he would have discovered that 90% of healthy asymptomatic adults display a significant slide from CR to CO. Dentists trained in the 1980's, or thereafter, learned that CR had changed from posterior superior to the anterior superior position.

L. D. Pankey became a great advocate of the CR theory. His Florida Institute has grown for over 30 years into arguably the most influential post-graduate dental teaching organization in the U.S. Tens of thousands of dentists have undergone extensive intense training to become masters of their trade. The Pankey Institute is training grounds to achieving personal and professional excellence.

Peter Dawson has long been one of the most respected authorities in this field. His textbook *Evaluation Diagnosis and Treatment of Occlusal Problems*, in 1974, is considered by many to be the bible of TMJ and occlusal theory. The Pankey, Dawson, CR philosophy has grown to dominate other cosmetic and reconstructive institutes and dental magazines.

At the heart of this philosophy is the belief that the TMJ is basically a hinged assembly. Deviation from the ideal hinged position (CR) by tooth contact will slide the mandible protrusively into harmful joint positions. Treatments involves orthodontics, routinely mounting study models, equilibration to manipulated C.R., establishing anterior and cuspid guidance, eliminating non-working contacts, splint therapy, and/or full mouth reconstruction to the manipulated C. R. position.

Functional Orthopedic Orthodontists

In the 1970's, a small group of general dentists calling themselves Orthopedic Orthodontists, proposed a shocking revolutionary new TMJ philosophy. They believed that the Temporalmandib-

ular joint was not a "hinge" meant only to rotate but the condyle head simultaneously rotates and translates forward and downward on the disc. They believed that the fixed maxilla sets boundaries to which the moving mandible must conform to. These boundaries occasionally force the mandible and condyles into damaging joint positions. They believe that in no joint in the human body is the ideal functioning position an extreme but reproducible border position and the Temporalmandibular joint is no exception.

These clinicians used strange retainer type devices to remove the maxillary obstacles. Narrow arches were expanded. Palatially inclined anteriors were labially crown torqued and most shocking of all mandibles were repositioned protrusively to correct Class II overjet cases.

Mandibular advancement had been around orthodontically but it was John Witzig and Terrence Spahl who brought these ideas to the forefront and used mandibular advancement to achieve ideal facial, orthodontic and joint development. Ron Levendowski added a new wrinkle by taking a series of transcranial x-rays with checkbites to center the joint in an ideal position called the 4/9 Gelb position. Here, the intimate relationship between the joint head, the disc and the articular eminence of the temporal bone is restored. At this joint position, functional orthopedists believe the disc is "recaptured", preventing the popping and cracking of the condyle head slipping off the disc. All teeth are then orthodontically or prosthetically aligned to support that joint position.

What started as a cult in the 70's has grown mainstream. Thousands of dentists flock annually to their meetings. Orthodontic laboratories worldwide produce millions of orthopedic appliances yearly. Many mainstream orthodontists have changed from retraction mechanics of headgear and bicuspid extraction in treating Class II cases to mandibular advancement.

Neuromuscular Dentistry

Form follows function and function follows form. Neuromuscular dentists strive to find the ideal jaw position where the muscles of mastication are most comfortable. Acute Temporalmandibular dysfunction manifests itself with "mandibular functional abnormality". These patients exhibit muscular hyperactivity with their mandible at rest and weak asymmetric functional activity.

Electronic jaw tracking records are taken by EMG (Surface electromyography) to measure muscle hyperactivity. A TENS unit (transcutaneous electronic nerve stimulation) is used to find the neuromuscular balanced joint position which displays reduced resting activity and improved masticatory function.

Once this jaw position is found, an acrylic intraoral orthosis is laboratory manufactured to be worn 24 hours per day for no less than 3 months. Subsequently intermittent neuromuscular testing is done to continually confirm the condition and stability at that position. Splint therapy and/or full mouth reconstruction may be needed to this ideal jaw position.

Muscular compressive strength and muscular electrical activity have proven to improve after 3 months of treatment versus pretreatment recording.

Since its infancy neuromuscular dentistry has also grown from Dr. Robert Jankelson and a select few to thousands of U S dentists. This philosophy has also grown to be the prevailing occlusal philosophy of several prestigious dental institutes in which thousands of dentists have trained.

Discussion

Nearly every dentist trained in the U.S. firmly believes that TMD is directly caused by occlusion. This has firmly been imprinted since early in their dental education.

Researchers studying this problem, however, are struck by some perplexing questions. For one, if establishing anterior guidance, cuspid rise and elimination of non-working interferences are keys to prevent joint damage, why isn't a severe open bite and automatic diagnosis for acute TMD? Obviously, this is not the case.

In fact, there are vastly different realities with regard to this topic in general dentistry's occlusion and orthodontics. Orthodontists routinely place overlying composite over lower molars or composite blocks palatal to maxillary centrals, thus allowing the patient to function only on these composite surfaces. Some orthodontists advance mandibles to correct their class II cases, others distal drive upper molars a centimeter or more. Despite such an invasive assault on the patient's occlusion, patient's joint symptoms rarely exacerbate.

Another question baffling researchers is that each of the previously mentioned TMJ philosophies should progressively worsen with increased age and usage especially when combined with tooth loss, osteoporosis, and arthritis.

A good analogy would be a massively over-weight truck on bed axles, severely rotated tires and blown suspension. Breakdowns should be directly proportional to miles traveled. However, Temporal Mandibular Dysfunction is predominantly a malady affecting predominately young or middle aged women.

Conservative Noninvasive Therapy

The N.I.H. preaches a much different mantra than the previous TMJ philosophies. They feel research has verified that acute TMD has little to do with occlusion and should be managed by conservative noninvasive methods.

Teeth only occlude minutes a day. Occlusal trauma and bruxism should generally be managed with night guards or N.T.I. Occlusion can be the cause of joint damage in the case of many missing posterior teeth. Here the head of the condyle becomes the stress bearing fulcrum instead of molar contacts.

These researchers believe the condition of acute TMD is stress induced and is most of the time self-limiting. "Current data is not persuasive that orthodontic treatment prevents, predisposes, or cause TMD and that therapies that permanently alter patients occlusion to prevent TMD cannot be recommended". "Evidence is also insufficient as to the benefit of routine prophylactic procedures to treat or prevent TMD".

Management of TMD by conservative non-invasive therapy includes:

1. Rest and dietary modifications
2. Pharmacologic NSAIDs, opiates, and muscle relaxants
3. Physical therapy
4. Splint therapy
5. Stress and psychological management.

Medicine has similar difficult to understand disorders which have stress and psychological components such as headaches, irritable bowel syndrome, chronic fatigue syndrome, and fibromyalgia. In fact, there are high co-morbidity rates with these ailments and TMD. These dental researchers equate acute TMD to backache. Here research reveals that patients who underwent very invasive back surgery and extensive rehabilitation yielded the same result two years later, as patients who underwent conservative noninvasive therapy only. The lesson here is that probably at least one of these TMJ philosophies is absolutely correct in neuromuscular and anatomical causes and treatment modalities but if the syndrome is most of the time self-limiting, why treat? At least practitioners could inform the patient that the condition is probably self-limiting rather than submit the patient to extensive rehabilitation. Are there legal repercussions for not informing the patient the condition is probably self-limiting? Should there be? Even worse, is very aggressive screening about this ailment on routine checkups of every asymptomatic patient.

Conclusion

"All truth passes through three stages. First, it is ridiculed. Second, it is violently opposed. And, third, it is accepted as being self evident".

Arthur Schopenhourer, on the wisdom of life.

Every dentist early in dental school has learned the importance of the dark mysteries of occlusion and the Temporalmandibular joint. Failure to master these complex mysteries may lead to that practitioner's patients developing acute Temporalmandibular dysfunction.

Three occlusal and TMJ philosophies have grown out of general dentistry from cult like status into powerful self-perpetuating national organizations largely without supporting research. Recent NIH research now threatens the foundations upon which these philosophies are based. TMD encompasses a wide range of joint ailments. Research is often subjective and difficult. Research articles of this subject sometimes contain statements such as "current research seems to indicate" or "further research is needed in this area".

Each of these philosophies can be effective in treating TMD. Is the treatment effectiveness due to the anatomic and neuromuscular reasons each mantra preaches? Is there a placebo affect in treatment? Is the treatment effectiveness due to the self-limiting nature of the ailment? Although "most" of the time TMD is transient and self-limiting, what is to be done with patients with verifiable joint pathology? How should general dentistry diagnose transient self-limiting symptoms from those of a more serious nature? How should patients with verifiable joint pathology be treated? Also, the conservative non-invasive philosophy, does not tell us where and how to place the bite on large complex cases, especially when a change in vertical is needed.

This fierce debate has raged now for nearly half a century. Patients suffering from the dilemma meander through a maze of conflicting realities after incurring tens of thousands of dollars in costs for treatments with questionable rational.

"When the facts change, I change my mind. What do you do, sir?".

John Maynard Keynes

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