

The **occlusion/pain** connection



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Brent or Jerry....can you e-mail me a brief CV so we can print it here. 150 words max. Thanks. Gail

Debate continues about the best way to manage occlusal interference when it is the cause of such problems as headaches and worn dentition. But if the bite's the problem, address the bite first.

By Dr. Jerry Simon

Because countless doctors see patients with headaches and because so many reasons exist for damaged teeth, TMJ dysfunction has become a controversial subject in dentistry and medicine. This article focuses on that aspect of head, neck, and facial pain (HNFP), and biomechanical dental disease (BDD) that can be shown to be linked to a conflict between teeth and jaw joints.

Tooth-jaw conflict

Consider how unlikely it is that all the teeth could fit together at the same time so that both of the jaw joints are centered. So, it is not surprising that most people have some occlusal conflict and many suffer consequences. The results of occlusal interference, commonly known as TMJ ds or TMD, include biomechanical dental disease (chipped, worn, broken, abfractioned, or loosened teeth) and/or head, neck, and facial pain. Taken together, they appear in well over half the adult population. Yet for many reasons, this syndrome is one of the most incorrectly treated problems in healthcare today.

The occlusal controversy

Part of the confusion is that occlusal interference shares common symptoms with many other causes of HNFP including arthritis, neuralgias, diseases of the jaw joint (such as osteochondrosis), tumors of the muscles and bones, diseases of the ear structures, and many more. The pain symptoms of occlusal interference are so varied and inconsistent that the pattern is often difficult to detect. Even the terminology is controversial. But, there is no confusion about the fact that headaches are among the most common reasons for patient visits to healthcare practitioners.

Two sources of pain

Even when the pain is determined to be part of the TMJ/TMD syndrome, there are really two distinct, but often overlapping conditions. The first is pain due to muscle fatigue, strain, and spasm caused by prolonged hyper-contraction of jaw muscles as a result of supporting structures being in an unstable position and or tooth clenching and grinding (extra-capsular).

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Occlusal conflict can result in worn teeth...



...chipped teeth...



...cracked teeth...



...and abfractions



The biomechanical philosophy has spurred the development of a variety of aids to help clinicians restore the balance between teeth and jaws.

Treating occlusal-related HNFP:

The 5 most common methods

1 The classical restorative dental approach. It is based on applying the laws of physics and biomechanics to the teeth and the jaw joints. This approach has been documented in the literature for as many as 75 years in the works of many prominent dental researchers such as Stuart, Stallard, Pankey, and Jankelson and others. Their basis of treatment was to relate the teeth and jaws to a mechanical system. Any imbalance was seen as an impediment to the system—unless the teeth and jaw joints could function in harmony, the dental system would be over-stressed and subject to breakdown. This ap-

proach has led to the development of many innovations, such as articulators, facebows, and mandibular tracking devices as well as biomechanical aids that assist in deprogramming jaw muscles (e.g., the Leaf Gauge and Best-Bite Discluder). Additionally, electronic devices that use electromyography to measure muscle activity and ideal biomechanics also have been adopted.

Among the sub-groups, one believes that the jaw joint must be able to get to a centered, ligament supported position. This approach is represented by

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the Pankey/Dawson group. Other respected clinicians subscribe to variations of this approach such as Kois, Spear, and Rondeau.

Another also believes that it is important for the bite to be balanced, but advocates an electronic method to determine the ideal position of the muscles and build the bite to that point. This group is represented by the follow-

ers of Jankelson, who developed the original Myomonitor and a methodology to use electrical stimulation of the muscles to achieve a proper jaw position.

Among these camps, there are dentists who believe that once the proper bite position is determined, if there are conflicts between the teeth and jaw joints, and if there is resulting HNFP or BDD, then these conflicts should be eliminated, either by occlusal reshaping (equili-

bration), restorative dentistry, or orthodontic tooth movement—or some combination of the three.

Another group believes that because the symptoms are so variable and often episodic, that they should create an orthotic, or bite splint to artificially establish the correct bite relationship. The rationale is that this temporary crutch would get the patient through a period of lowered resistance to when they might be able to again tolerate their bite. One advantage of the bite splint approach is that it is reversible.

Bite treatment proponents say the approach reduces biomechanical forces on the teeth and does no harm if performed properly. Other fields of medicine, such as orthopedics, recognize the importance of proper biomechanics. If the person's tolerance is such that the dentist cannot get the degree of unevenness below the patient's tolerance, typically less than 10% of the cases, additional methods can be incorporated.

2 Bypass the teeth, target the muscles. Another approach acknowledges that HNFP is indeed a muscular pain problem, but advocates bypassing the teeth and focusing on the muscles themselves. Chiropractors and physical therapists are often called upon to treat these types of patients more frequently than dentists. Often, there is limitation of movement associated with HNFP and the physical therapist may be brought in on the team to help with joint mobilization. Chiropractors are also associated with HNFP and they often correctly diagnose that the joint is not right and that there associated muscle spasm pain. Physical therapy and chiropractic treatment can provide temporary relief by relaxing sore and painful muscles, but the relief is temporary and repeated visits may be needed to keep re-adjusting and releasing tight and sore muscles as the stimulus remains untreated.

3 Behavior modification. Doctors justifiably questioned why people with a similar bite have different responses to it? The position they took was if they could alter the responsiveness of patients to their bite, destructive tooth clenching and grinding and the accompanying HNFP could be eliminated. In addition, the role of stress in tooth clenching and grinding was observed and thought to be a major factor in the process. As a result, many healthcare practitioners focused on stress control and looked away from the dental biomechanics.

While it is theoretically possible to convince a patient with a rock in his/her shoe to not be bothered by the rock, it makes more sense to remove the rock. We recognize that every shoe will have some very slight imperfections in the surface, but once the rock is out and the stimulus is significantly reduced, most people can shift their focus from the slight remaining

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The second is pain from an inflammatory or degenerative process within the jaw joints (inter-capsular). Most studies cite that over 85% of TMJ/TMD pain is occlusal muscle and not inter-capsular.

Other disagreements arise about terminology as well as how to determine end points of treatment, how teeth should fit together, and even when that goal is reached.

In many cases, errors in execution have been wrongly interpreted as a failure of the technique. Adding fuel to the fire, governmental regulatory authorities (such as the NIH), in hopes of protecting the public, continue unsuccessfully to issue standardized guidelines and regulations for treatment.

There is more to the occlusion/pain connection than biomechanics, although that is certainly a significant factor. Dr. Henry Tanner, former professor at USC Dental School and instructor at the Pankey Institute, said, "Occlusal disease is a combination of the patient's bite and what they do with it." In other words, some people can tolerate more "unevenness" in their bite than others. As a result, there are four categories of occlusal disease:

- Significant occlusal interference with little to no HNFP or BDD;
- Significant occlusal interference with significant HNFP or BDD, or both;
- Minor occlusal interference with significant HNFP or BDD or both;
- Corrected occlusal interference and continued HNFP or BDD or both.

Two approaches to treatment

Even when there is agreement that the problem is indeed a TMJ/TMD disorder, and all other causalities for HNFP have been ruled out, there are still essentially two general approaches to HNFP caused by occlusal interference. The first is focused on treating the biomechanics to eliminate pain. The second is focused on altering the patient's reactivity to the existing biomechanics.

The medical and dental professions have gone through cycles of focus in regards to these two general approaches. Initially, the dental profession had a strictly biomechanical treatment approach. Not surprisingly, the non-dental healthcare practitioners have had a strictly non-biomechanical approach, using the psychosocial and pharmacological approaches to minimize the responsiveness of the patient to the internal issues causing tooth clenching and grinding. Due to the inconsistent results of all forms of treatment, the focus shifts back and forth, even among dentists, depending on the experience and training of the particular healthcare practitioner. However, advancements in diagnostic and treatment techniques with well documented, successful, long-term results have fostered a considerable resurgence in biomechanical treatment among dentists.

With that as a background, it's possible to summarize the generally accepted ap-

proaches to treating HNFP that has been identified as being part of the TMJ/TMD syndrome. See the sidebar on page XX.

Summary

The debate continues, often worsened by internal schisms among individual groups and the diverse educational backgrounds

and different vocabularies of the various healthcare practitioners. We believe patients can receive the most appropriate treatment for their individual situations through increased communication among the various healthcare providers.

HNFP caused by muscle spasm or fatigue secondary to occlusal interference

due to tooth clenching and grinding can be treated by reducing the stimulus or by reducing the body's reactivity to the bite condition. If the bite is the problem, then it seems prudent to address the bite first and use the other methodologies for ancillary support, rather than to depend on them as the full treatment. **DPR**

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stimulus. If the patient is bothered by any unresolved psychological or emotional issues, then it is appropriate to consider the use of psychotherapy.

4 Combining biology and the behavior. Biofeedback is based on the successes of a trained individual's ability to gain control of autonomic bodily functions. This

requires educating patients that they are clenching and grinding, creating a desire to change this behavior, and training them—usually with some type of biological monitor—to consciously interrupt the process.

This approach requires training and conscious interception by the patient, which is no value while the patient is asleep. While this approach could be used as an adjunctive therapy for patients who do not respond to cor-



Equilibration, restoration, and/or orthodontia can permanently eliminate occlusal conflict.



A bite splint artificially establishes the correct bite relationship.

recting their bite, it makes little sense as a primary therapeutic approach.

5 The pharmaceutical-based approach. Primarily sponsored by the neurological branch of the medical profession, this approach is based on the nature and mechanisms of pain and muscle activity and how to alter the processing and interpretation of pain in the brain and central and peripheral nervous systems. Research has discovered a vast interconnection between the CNS, the peripheral NS, and the endocrine system. Some researchers have gone so far as to state that memory and thought itself are not restricted to the brain and the CNS.

This approach uses drugs that mediate and control processing functions in the body. Among the most popular—muscle relaxants, pain medications, anti-inflammatory agents, psychoactive medications such as anti-depressants, the family of drugs known as the “tryptans”, and now Botox (for muscle paralysis).

It is vital to realize that there are benefits to symptoms and reactions in the body. Doctors must strive to determine which responses have benefits, and when those benefits become detriments. With a broken bone, pain is a warning or message to encourage treatment. Once the patient complies, the pain no longer serves a purpose and should be eliminated for comfort. However, it would be foolish to medicate the patient to relieve the pain and not treat the underlying pathology. Pain medications and muscle relaxants are often useful as a temporary crutch while the cause of the pain is being addressed. Additionally if the bite treatment cannot provide the complete solution, appropriate medications should be utilized. But masking symptoms with pharmacological agents is not a substitute for eliminating the cause. J.S.

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