I have a 33-year-old woman who came to me with a history of clenching both while asleep and at work. She has a medical history of seasonal allergies treated with antihistamines and uses birth control medication. I see significant anterior and posterior wear, and she is symptomatic with headaches and sore facial muscles. I made a hard acrylic maxillary University of Michigan splint, which she wears consistently. On recall, she told me she feels, as she puts the splint in at night, that she clenches on it almost immediately, and with a lot of intensity. She states she does not sleep as soundly with it as without, and feels that her muscles are sorer than if she forgets to wear it. She is a physical therapist, so does massage and stretches of her muscles which helps relieve the morning tension. The splint has wear in the acrylic. I am not sure what to do at this point. I asked her if the vertical opening felt excessive and she did not think it was a factor. Does anyone have any thoughts or experiences with this type of issue? I appreciate any and all comments.

Jeremy Dull

If she’s clenching during the day, I was taught that splints during the day can make it worse as the patient becomes more “occlusally aware” (just read that a few days ago on here and I love this term). I have told my patients if you clench all the time, stop doing it. Set an alarm every 15 minutes to half hour on your phone to check if you are clenching. If you are, stop. The idea being that clenching is aberrant behavior and should be stopped. If they can regulate themselves, they don’t fatigue their muscles. One of the senior TMD doctors at my school likened it to holding your arm up all day.

If she sleeps better without it, stop wearing it. I remember reading that it was something like one-third of people do well with guards, one-third have no change and one-third get worse. While you shouldn’t quote me on that, there is a significant portion of people who get worse with splints.

Jeremy Dull

What is your rationale for trying to control “clenching” with a full-coverage splint? What design-aspect of a Michigan lowers clenching intensity?

Without seeing the patient or the appliance, I would suspect that her posterior teeth are occluding more with the splint in than without. More posterior contact, more elevator intensity. I imagine that your Michigan could be refined to be more affective, but this would scream NTI therapeutic protocol to me with minimal VDO and no excursive posterior contacts.

Jon Reth

I agree with Dr. Boyd; anterior bite splint or NTI appliance will keep the posterior teeth out of occlusion, therefore, eliminating the triggers.

tthfairy4u

Sometimes when patients say they clench more when wearing an appliance, I think that simply translates to them noticing their bruxism more when the appliance is in. It calls atten-
tion to their existing habit. Kind of like when you cut your thumb and put on a Band-Aid, you notice how much you really use your thumb. But the Band-Aid doesn’t make you use your thumb more. ■

I do not hold myself out to be any type of occlusal therapist, with no expertise in these matters. I am also not trying to be disparaging of those who do know and practice in that area. This is just my anecdotal experience.

I have had three patients who have/had clenching/bruxism in the past, two of whom went to see a dentist who held himself out to be a TMD specialist. After a lot of money in ineffective treatment, they are back with me with the same problems. I had no idea what to do except to try and give them some relief. In all three cases, mostly out of desperation, I put them in soft splints, just mouthguard material sucked down on a plaster cast. I inserted them, adjusted occlusion so the articulating marks were as even as I could get them.

All three claim relief. I have told them this is only treating the symptoms and it needs further diagnosis, but that I do not know anyone in our area who is qualified. Again, this treatment was done mostly out of desperation. I know the literature disparages the use of soft splints, but when you have patients of limited financial means not able to travel long distances to seek proper treatment, you do what you have to do to help get them out of pain.

Two of these patients are still in my area. Every few months or even a couple of years I remake them a new soft splint. They chew right through them. One of the patients does not hesitate to call me on a weekend if she loses her splint; she cannot go a night without it.

One of the reasons why I think AOB develops from NTI therapy is because many docs don’t do a great job of screening joints that have disc displacements, both partial and complete. The disc does occupy space between the condylar head and temporal fossa. When this disc is displaced, the condyle now seats into tissue. Tissue can compress (to some degree) while the disc does not.

If the tissue has any effusion (swelling) or is not yet adapted, then it has the chance to compress and possibly become adapted. The changes seen in the joint due to this compression is the condyle “seating.” This can result in an anterior open bite.

Here is a case that a local dentist (near my office) treated with a full maxillary rehab. He didn’t perform any deprogramming prior to treatment, but fabricated an anterior stop appliance after treatment. The patient had a complete disc displacement on JVA. He got scared that her bite opened after treatment.

Not to derail this thread, but to the original poster, I would fabricate an anterior mid-point stop appliance, an NTI (agree with Jim and Jon), and I would be interested in seeing how it affects this patient’s symptoms. ■

To respond to the many points here: My practice is limited to TMD and orofacial pain in Coral Springs, Florida. I also am adjunct faculty at Nova Southeastern Dental School teaching both undergraduates and graduate residents, and lecture nationally and internationally at dental meeting study groups, etc.
Increased bruxism with splint: This occurs with my patients often and most of the time it is because the splint has made them aware of how much they are putting their teeth together. Nocturnal bruxism and daytime bruxism are two separate species.

Regarding nocturnal bruxism: I have these patients continue to wear the splint for two weeks and add a muscle relaxer (usually flexeril 5mg QHS) and this solves the problem for most of the patients. The fit of the splint has to be precise with no rocking, no movement or “give” on clenching, and no pressure points on the teeth. The splint has to be meticulously adjusted for even contact in a physiologic joint position. “Comfort” splints (e.g., Glidewell) are not indicated for TMD patients. There are patients however who do brux more with a splint in. I am not against using an NTI in these situations, however, it is because of the reduced bulk, not the reasons stated by Dr. Boyd, and the patient should be able to be transitioned to the full coverage splint. In my opinion the NTI is contraindicated in patients with disc displacements and TMJ arthritis. The evidence base is clear that the NTI is no more effective in reducing pain from TMD than the Michigan splint.

It is reported in the literature and has been my experience that NTIs cause anterior open bites and that the mechanism is most likely posterior eruption and anterior intrusion. I also have a number of patients with resulting anterior open bites from just nocturnal wear, and the pictures to prove it. If you use NTIs, you must have a patient sign a release understanding that bite changes may occur. I have no idea of the actual incidence and it is speculative that one to two percent is realistic.

For the patient where bruxism is really increased by the splint, probably the best thing is to refer them to an orofacial pain specialist. In the case of these patients, I would want to know first if their sleep physiology is normal and possibly order a sleep study. Other medications may be indicated.

As far as daytime bruxism, I discourage long-term daytime wear and prefer to use classical conditioning techniques with interval timers to condition patients to keep their teeth apart. I have had almost 100 percent success with this method in compliant motivated patients in 48-72 hours and then occasional reinforcement. People brux more during concentrated tasks, like computer, reading and driving time, and need to be aware of this. This is where the timer is most helpful.

As far as education in TMD and orofacial pain I completely agree with the statements of Dr. Bender. I have found the vast majority of my students and the dentists in my CE courses are completely unprepared to deal with TMD patients when they present in their practices. I show both simple and complex case histories during my presentations and ask my audiences of dentists what their approach would be. Most of them sit like deer in the headlights. Of those who do comment, I most often hear about only occlusal approaches. “I would get the patient in CR with bimanual manipulation,” or “I would mount study models,” or “I would put the patient on a TENS positioned myomonitor.” Although the TMJ/RDC criteria (research diagnostic criteria) for TMD have been published in 1992, dentists still tell their patients that they have “TMJ” or “TMJ syndrome” and are unable to make an accurate diagnosis.

We have a long way to go in getting basic evidenced-base information to dentists and to the public. In my experience, most dentists have no idea how to do basic splint therapy. I am hoping that I can make some small difference in this with my interaction with dentists. I know that dentists today want to do the “sexy” stuff (implants, cosmetics, etc.) and they may not see the relevance of TMD to their everyday practices. This knowledge is important and essential to your practice success. I certainly don’t think that every dentist has to have an expertise in orofacial pain, but certainly needs the basics.

[Posted: July 3, 2013]

Mike: I think that continuing education is great and appreciate Dr. Nosti’s comments, but it’s really easy to screen patients with disc displacements. I think I can explain it here easily:
You can have the following joint sounds:
• Clicking: distinct short lasting pops, clicks, etc.
• Crepitus: sandy rough sounds that may last throughout the opening and closing movements
• Eminience clicks: duller “thud” like reciprocal sounds as the joint goes beyond the eminence and back
• “Crackling” sounds in patients with limited openings with disc displacement without reduction

Crepitation in joints usually indicate arthritic changes. Most disc displacements are anterio-medial along the long axis of the lateral pterygoid muscle. Anterio-lateral disc displacement is also common. Posterior disc displacements are extremely rare (I have seen one in 35 years).

The two common disc displacements according to the TMJ/RDC are:
• Disc displacement with reduction DDWR. In these cases, the disc is displaced in front of the condyle and clicks on as the joint comes underneath it when opening. There usually is a closing click, although this may be hard to hear.
• Disc displacement without reduction DDW/OR is when the disc has gotten so far out in front of the condyle that it does not pop back on top and now the patient has limited opening or closed lock.

As we all know, painless clicking joints with no dysfunction do not need to be treated according to evidenced-based standard of care.

So what do we look for?
[Editor’s Note: See online message board for a list of what to look for.]
Dr. Nosti is correct. Most disc displacements can be heard with a stethoscope. I personally don’t see the benefit of more sophisticated instrumentation. Many sounds can be felt with just the fingertips. I want to emphasize just one more thing about “end feel.” I described a “hard end feel above,” which indicates DDWOR, however a “soft end feel” (when the patient initially opens to 25mm but then opens to different larger measurements) indicates a myospasm and easily distinguishes a joint problem from a muscle problem. — Harold Menchel

Just interested in the types of responses, like why you want posterior disclusion in excursive movements (if they go there), but not during centric clenching?

Physiologic joint position is another weird issue; if it changes all the time, then why worry about it? If you use anterior midpoint stop appliances, the changes don’t manifest in any type of “interference” on the appliance. I like not having to worry about it.

As for muscle firing, it definitely happens with postural reflex, but increases dramatically with tooth contact, especially molar contact. I did the same appliances as you for many years, and had good success, but nothing like when I switched to AMPSAs. Plus the time savings in appliance adjustments is phenomenal, as is patient compliance. If you really learn to tweak the design, you can avoid the development of AOBs, plus save yourself a lot of aggravation with adjustments. I just don’t see the downside, and wouldn’t want to go back to the full-arch splints ever.

Sure, we don’t know that elevated EMGs are responsible for muscle pain, but they probably compress joint tissue more than low EMG levels. So, while the mechanism of action isn’t known for any type of splint, I think I’ll stick with the easier ones with the best patient compliance. After all, there’s no science behind full-arch splints either.

Protrusive parafunction is the number-one oversight causing therapeutic failure when using an NTI (or any splint therapy).

Practitioners just don’t think it happens, apparently because somebody else said so. Does anyone ever think to minimize the vertical dimension when clenching in protrusive on a full-coverage splint? Why not? Because nobody thinks it happens, and when it does, it’s just bilateral posterior contact allowing a monstrous clench with the condyles hung out to dry.

Protrusive clenching is just bilateral LP contraction prior to clenching, as opposed to unilateral excursive clenching.

Treating parafunction with a nocturnal device requires minimizing elevator contraction intensity (via incisor contact) and minimizing joint strain/load (by striving for minimal condylar rotation during the event). If you can’t do that with a full coverage splint, it doesn’t mean it can’t be done. — Jim Boyd DDS

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