

The Dental Decision Maker

Reducing or Eliminating Failed Dentistry



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Every day in your dental practice, you tackle a variety of challenges that you diagnose and solve for your patients. Just think, for a few moments, about the patients you have seen this past week. Did you talk to them about periodontal disease, issues

involving their temporomandibular joint (TMJ), broken teeth, root canals, crowns, bridges, dentures, and implants? Of course you did. These are the most common dental issues that come up in the office routinely.

Is that list complete? What if I were to tell you that this list does not include the most common dental disease that affects fully one third of your patient population? You never measure it and most clinicians don't even see it. Yet, this dental condition causes countless problems for your patients and often is the main reason for broken teeth, TM disorders (TMDs) and/or orofacial pain, and most failed dentistry, including simple restorations, crowns, bridges, and implants.

Many of you are probably scratching your heads trying to think of what it could possibly be. How could you possibly be missing something that occurs in one third of your patients? The primary reason we don't think about this disease is that it is so common, the majority of clinicians almost accept it as being normal. Furthermore, until now, there has been no way to objectively measure it. Once we are able to measure this condition, then we can wrap our heads around it, treat it, and then measure it again to make sure our treatment is actually working. If our treatment is not working, then we can readily adjust the treatment until we reach a satisfactory outcome.

WHAT'S THE DENTAL DISEASE IN THE SPOTLIGHT HERE?

I hope by now that you have figured out that I have been describing *bruxism*. Bruxism is an underlying condition that can affect every single dental treatment that we provide. It is also the key factor in determining the long-term prognosis and success of the dentistry that we work so diligently to deliver.

Think about what moments in your daily practice that you dread the most. Certainly, one



Figure 1. Panoramic radiograph (Panorex) showing most of patient's dentistry on left side and tooth No. 13.

How could you possibly be missing something that occurs in one third of your patients?

of them is when your patient shows up with a crown in his or her hand that you placed a short time ago. Your stomach really gets upset when there is tooth structure inside the crown and, even worse, if there is a post sticking out of it. This is the post-and-core that you had literally placed immediately after the endodontic treatment was done. Of course, you know that this scenario now represents a costly situation that will need to be addressed with retreatment and replacement work at no charge to the patient. Or, are you going to pay for an implant (or at least offer a discount) and new crown that the patient may now need?

BRUXISM: A CLINICAL CASE EXAMPLE

Let me share a case presentation about a patient with a situation that happens routinely in every dental office and show you how new technology to measure bruxism can help you eliminate the dreaded scenario mentioned above. This will dramatically improve the long-term prognosis of every dental treatment that you will provide from this point on. In addition, bruxism monitoring will help you decide on the best course of treatment for the patient based on objective, evidence-based data.

The patient here is a 23-year-old female named Liz. She had been suffering from TMD/orofacial pain in her head and neck since she was 19 years old. Other than her history of myofascial pain, she was always a very active individual in excellent health. Her dental history was found to be another story, especially related to the left side of her dentition, where she had multiple restorations placed.

When she was about 19 years old, she began breaking some of the restorations and teeth on the left side of her mouth, all requiring treatment by her dentist. The upper second bicuspid (tooth No. 13), was particularly problematic as it eventually required endodontic therapy. The tooth was restored with a composite resin restoration at the time as the patient could not afford a full-coverage crown. This worked well for about a year, then the tooth began chipping again.

Liz changed dentists and had an initial examination and radiographs done by her new doctor (Figure 1). The first question any dental professional should have had, at this juncture in time, was: Why does this patient have more restorations on her left side than her right side? The second question should have been: Why do her teeth keep chipping? Most of us do not spend more than a minute (if that) thinking about why these things have been happening; we simply deal with the situation as it presents.

After a consultation, the patient had agreed to have a post, core, and crown on tooth No. 13 at a considerable cost. The doctor seated the crown and the patient was pleased with the result.

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Figure 2. The patient's face exhibited a square appearance due to very large and asymmetrical masseter muscles related to her TM disorder/orofacial pain.



Figure 3. Bite-wing radiograph of the previously placed dental implant suggested osseous cupping of bone around the implant neck.



Figure 4. Radiograph showing mesial bone loss; the implant was beginning to loosen.



Figure 5. The home STATDDS Bruxism and Sleep Monitor provided objective data on bruxism and obstructive sleep apnea.

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The Dreaded Post-Treatment Phone Call

Only 2 months after the crown was placed, Liz called her dentist's office to let them know that she would be arriving with the crown and post in her hand. How would you feel as the treating dentist, as you walk into the treatment room and see your patient with that crown and post sitting on the tray?

So, 2 months after the crown was seated by her new dentist, the tooth was nonrestorable, requiring an extraction, bone graft, and an implant. Before sending the patient to an oral surgeon for an implant, should one be thinking about why this happened? Most of us still don't give it a second thought, assuming immediately that it must be a material or functional failure. The patient is simply told what the next step is and everyone moves on. (Note: A failure due to the cementation/bonding protocol, a lack of adequate ferrule and/or a cementation failure, or occlusion problems should all definitely be considered.)

Fast-forward one year. The final implant crown was placed (IPS e.max [Ivoclar Vivadent]) by the same dentist. Liz was so happy to have a new strong tooth that looked great too. However, she continued to suffer from TMD/orofacial pain and, a few months after the crown had been delivered, Liz was referred to our practice for a TMD and orofacial pain evaluation.

Now She Became Our Patient

Figure 2 shows Liz at her initial examination in our office. When properly trained in orofacial pain therapy, the first thing one learns to do is to take a complete medical history and do thorough evaluation as an important part of achieving a proper diagnosis and treatment plan. The only addition to her medical history mentioned above is that she had been seeing her primary care physician and a neurologist for headaches. She had tried a variety of

Bruxism Overview					
	Count	Index (#/h)	Shortest (s)	Longest (s)	Average (s)
Bruxism Episodes:	60	6.8	2.0	15.9	5.9
Phasic Episodes:	24	2.7	2.4	12.1	5.8
Tonic Episodes:	32	3.6	2.0	15.9	5.7
Mixed Episodes:	4	0.5	6.9	11.8	9.1
with Tooth Grind	0	0.0	0	0	0
Bruxism Bursts:	160	18.0			
All Bursts:	502	56.5			
Bruxism Episodes Index:		6.8/h	Apnea to Bruxism Index:		0.5/h
Bruxism Bursts Index:		18.0/h	Arousal to Bruxism Index:		0.0/h
AHI	3.6	ODI	N/A	Snore Index	0.0%

AHI is the number of apneas and hypopnea per hour. ODI is the number of oxygen desaturations per hour. Snore index is the percentage of time spent snoring versus the total time spent in bed.

Figure 6. Preoperative testing showed a high Bruxism Episodes Index, proving the patient was a destructive bruxer.

Bruxism Overview					
	Count	Index (#/h)	Shortest (s)	Longest (s)	Average (s)
Bruxism Episodes:	12	2.0	2.7	13.7	6.5
Phasic Episodes:	5	0.8	2.8	10.7	6.1
Tonic Episodes:	6	1.0	2.7	10.0	5.8
Mixed Episodes:	1	0.2	13.7	13.7	13.7
with Tooth Grind	0	0.0	0	0	0
Bruxism Bursts:	37	6.2			
All Bursts:	71	11.9			
Bruxism Episodes Index:		2.0/h	Apnea to Bruxism Index:		0.0/h
Bruxism Bursts Index:		6.2/h	Arousal to Bruxism Index:		0.0/h
AHI	3.2	ODI	3.8	Snore Index	0.3%

AHI is the number of apneas and hypopnea per hour. ODI is the number of oxygen desaturations per hour. Snore index is the percentage of time spent snoring versus the total time spent in bed.

Figure 7. After trigger point injections with Xeomin (STATDDS), post-testing was done to verify elimination of bruxism. The patient was then restored.

In this case (as routinely performed in our practice), cranial nerve, ear, TMJ, and dental examinations were done, and all findings were found to be within normal limits.

medications, which did not help manage her pain and, at the time of this visit, was not taking any medicines having decided to simply "live with the pain."

What Do You See?

Let's evaluate this patient's head and neck musculature, since approximately 85% of TMD and orofacial pain comes

from muscle disharmony. Before doing a complete head and neck trigger point examination, I looked closely at her face. What do you see in Figure 2? Let me share what I observed. Her masseter muscles were enlarged, giving a very square appearance to her face. Take a closer look and you will see that her masseter muscles are asymmetrical,

with the left masseter being quite a bit larger than the right masseter. That is very interesting, since most of her dentistry had been done on her left side.

In this case (as routinely performed in our practice), cranial nerve, ear, TMJ, and dental examinations were done, and all findings were found to be within normal limits. There was one area of concern from her dental examination: her left bite-wing radiograph (Figure 3) was showing some osseous cupping around the implant that had been placed 1.5 years before. The periapical radiograph (Figure 4) demonstrated a deficiency in the trabeculation of the bone on the mesial of the implant. Indeed, the tooth was slightly loose (we will address this issue later). I then checked the occlusion; it seemed to be fine with no centric, lateral, or protrusive interferences.

The trigger point muscle examination revealed trigger points in the trapezius, superficial masseter, and deep masseter muscles. This caused repeatable moderate to severe radiating pain to the corners of her jaws, both TMJs (left one was worse), front of her head, and behind her eyes. She said that this was exactly the chronic pain that she felt, which would then turn into headaches that occurred on a daily basis.

Knowing the Numbers: BEI and AHI

There was one more very important piece of diagnostic information that we needed to know before treating a patient like Liz. We needed to quantify (measure) her bruxism so that we could know exactly what we were facing in order to be able to treat her. We then needed to repeat the measurement after prescribed treatment to quantify treatment efficacy. We also needed to know if the patient had any sleep disorders that might have been contributing to bruxism. So, she was given a home STATDDS Bruxism and Sleep Monitor (Figure 5) with instructions for use. This bruxism/sleep test provides valuable information about the patient, the Bruxism Episodes Index (BEI) and Apnea/Hypopnea Index (AHI).

The BEI is the number of bruxism episodes a patient has per hour of sleep. A number higher than 2.5 suggests significant bruxism that should be addressed. A BEI higher than 5 is indicative of very destructive bruxism that can easily break and chip teeth and/or any dental restorations. If the AHI is higher than 5, then the patient has obstructive sleep apnea (OSA), needing a medical diagnosis by a physician, and possibly an oral appliance and/or any prescribed care recommended by the physician. These numbers are very important in guiding our treatment decisions and, through post-testing, will let us know if our treatment protocol is working.

For Liz, the initial STATDDS bruxism/sleep test resulted in a BEI of 6.8 and an AHI of 3.6 (Figure 6). These test results indicated that she did not have OSA; however, the BEI (at 6.8) indicated that she did have destructive bruxism. Now, armed with the right diagnostic information, my team and I were ready to begin treatment.

Trigger Points

Trigger point injections with botulinum toxin (incobotulinumtoxinA) (Xeomin [STATDDS]) were performed in the affected muscles mentioned previously. Xeomin is an alternative to Botox (Allergan); equally effective, but much less expensive. Ten units of Xeomin were used in each one of the affected muscles, except for the left masseter; this muscle received an additional 5 Xeomin units due to its larger size. Xeomin was also delivered into the frontalis, lateral orbicularis oculi, procerus, and corrugator muscles bilaterally.

An amazing thing happened at this treatment appointment—the headache Liz had that day started to go away immediately, and in addition, the intermittent radiating pain started to resolve. By the end of the appointment, about 80% of her pain was gone. It takes from 2 to 10 days for botulinum toxin to take full effect and, indeed, one week later, all of her pain was gone for the first time in years.

How did we know if our treatment for Liz was really effective? She was given a post-test using the STATDDS monitor. Figure 7 shows her post-test results demonstrating a BEI of 2.0 (an insignificant score). In Figure 8, the postoperative full-face photo of Liz shows the clearly improved facial aesthetics with a more heart-shaped face and normal-sized masseters. Figure 9 shows another before-and-after comparison. Liz was given a Custom H/S Bite Splint (Glidewell Laboratories) to protect her teeth from any bruxism that



Figure 8. Before-and-after photos showing the excellent aesthetic and therapeutic treatment outcome.



Figure 9. Before-and-after photos of a very happy patient. She was now free from pain for the first time in years.

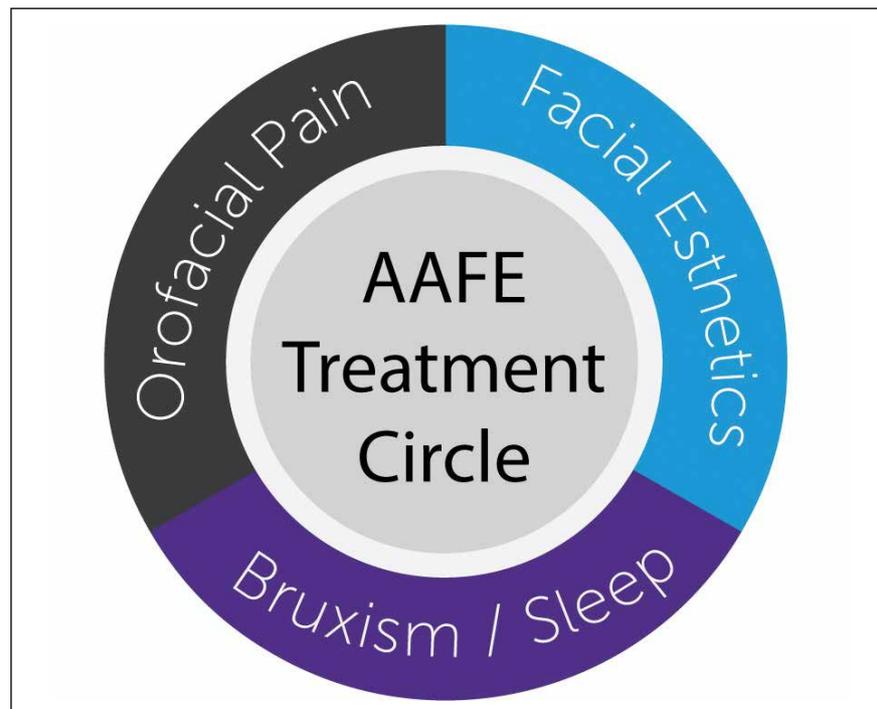


Figure 10. American Academy of Facial Esthetics Circle of Treatment.

might recur as the botulinum toxin wore off. Now, what about the upper left bicuspid implant? If it were to fail in the future, in my practice it would be replaced with an implant (such as a Hahn implant, due to its excellent

initial stability) and a high-strength all-ceramic crown (such as BruxZir Translucent [Glidewell Laboratories]).

Wouldn't It Be Nice to Know?

The one question that I have for every

single dentist reading this article: wouldn't it have been nice to know this patient's BEI *before* the endodontic treatment had been done a few years ago? Think about how much this young patient went through, including dentistry that she might have been able to avoid, had her bruxism been measured and controlled. Before doing any restorative case (especially ones that include crown and bridge, dental implants, or porcelain veneers), the clinician should test the patient for his or her BEI number to know exactly how much the patient is bruxing so treatment can be rendered, if necessary. This will make any dentistry delivered last longer, and it will also help the patient preserve his or her own natural teeth. My friend and mentor, Dr. Gordon Christensen, says, "Bruxism monitoring is one of the most important concepts today!"

CLOSING COMMENTS

Training is the key in the areas that we call the American Academy of Facial Esthetics (AAFE) Circle of Treatment (Figure 10). Training and proficiency in diagnosis and treatment planning, and clinical treatment protocols in facial aesthetics, facial pain, bruxism, and dental sleep medicine, should be attained.

You too can make your patients look great, feel great, and sleep great!♦

Dr. Malcmacher maintains a general and facial aesthetic private practice in Cleveland. His group dental practice has maintained a 45% overhead since 1988. He is president of the American Academy of Facial Esthetics (facialesthetics.org), which presents more than 200 courses a year on Botox and dermal fillers for dental aesthetics as well as frontline TMJ, headaches, facial pain therapy, bruxism therapy, dental sleep medicine, and dental implant training. He is an evaluator emeritus for *Clinicians Report*, a master of the AGD, a Fellow of the International Association of Dental Facial Esthetics and the World Clinical Laser Institute, a visiting lecturer at a number of universities, a contributing editor for *Dentistry Today*, and a spokesperson for the AGD, and he has served as a consultant to the Council on Dental Practice of the American Dental Association. A monthly columnist and contributing editor for *Dental Economics*, *Dental Tribune*, and the *Common Sense Dentistry Newsletter*, he has been named one of the Leaders in Continuing Education by *Dentistry Today* since 2000. He works closely with dental manufacturers as a consultant and clinical researcher in developing new products and techniques. He is an internationally known lecturer and author, having addressed many major dental meetings and local dental societies throughout the United States, Canada, Europe, and the Middle East. His educational organizations have presented nearly 20,000 hours of continuing education worldwide, and he has published thousands of articles in dental journals during the last 35 years. He can be reached at (800) 952-0521 or via email at drlouis@facialesthetics.org.

Disclosure: Dr. Louis Malcmacher is the president of the American Academy of Facial Esthetics and a consultant for STATDDS.