

**The Dental Patient with Somatoform Disorder: Diagnostic and
Treatment Challenges in Occlusal Dysesthesia**

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Men are disturbed not by things, but by the view which they take of them.

Epictetus, 55-135

Aim:

The aim of this chapter is to provide the dentist with an overview of potential diagnostic and treatment issues posed by patients who present with Somatoform Disorder. A patient with occlusal dysesthesia or "Phantom Bite" is presented to describe the challenges frequently encountered when attempting to diagnose and treat a patient with Somatization Disorder.

Introduction:

In dental practice one will encounter patients who are extremely focused, if not obsessed, with an orofacial complaint. The patient may complain of cosmetic concerns that seem imperceptible; of irrational fear of oral cancer in spite of negative physical findings, or they may present with a debilitating atypical pain, again without clear etiology. However, one of the most perplexing conditions is the patient who presents with *occlusal dysesthesia* (OD) also referred to as "*Phantom Bite*"¹. OD patients are preoccupied with their dental occlusion and convinced that their *bite is off* and abnormal^{2,3}. The patient will be constantly *checking their bite* or attempting to reposition their jaw to *find their bite*. Frequently the complaints are long standing and can occur at any stage of dental care ranging from simple fillings to more extensive restorative procedures, orthodontics, or oral surgeries. Their perception of an abnormal occlusion persists despite repeated failed attempts to adjust the patient's occlusion. No dental or pharmacological treatments have proven to be effective in reducing OD. Repeated failed treatments further reinforce the patient's illness conviction that something is seriously wrong with their occlusion. When the dentist provides reassurances that nothing is wrong with their occlusion their distress escalates further. In an attempt to reassure the patient and reduce their distress and concerns, the dentist may refer the patient to an orofacial pain or TMD specialist for a second opinion. Though well intentioned, the referral may do the opposite and further increases the patient's anxiety, somatic preoccupation and illness conviction. The patient misinterprets the referral as an indication that the dentist believes

the problem to be very serious and is providing a referral to a specialist to confirm the severity of the disease. Thus, these patients not only misinterpret physical sensations regarding their occlusion, but also most health related communications.

OD patients are persistent in seeking multiple opinions and are frequently unreasonable in their demands for their problem to be "fixed." The OD patient frequently presents with "tedious" verbal and written monologs chronicling the details of their dental problems and past treatment failures³. They are invariably dissatisfied and angry with all of their dentists' prior failures to resolve their occlusal complaints. Moreover, it is not unusual for these patients to be very litigious and want to "get back at" the dentists they perceive as having caused them harm. In spite of this they persist in looking for the "fix" and this eventually results in the patient falling victim to iatrogenic complications as a result of overly zealous attempts to accommodate the patient's persuasive demands to "fix" their occlusion.

The patient's symptoms and lack of clear physical findings may appear to the dentist to be a relatively minor problem and certainly not warranting the degree of distress and disability being displayed by the patient. Further occlusal adjustments, splints, orthognathic, orthodontic or surgical interventions will not alleviate the OD but may even exacerbate the problem. Since no dental or neurological findings have been reported that can account for OD it is possible that these patients may, as a result of a psychological condition called *Somatoform Disorder (SD)*, be *somatizing* that is, exhibiting severe somatic focus and mysterious occlusal complaints. Until the SD is addressed with psychological treatments, continued dental treatments will in all likelihood fail if not worsen the problem.

What is SD? What is its etiology? What can be done to treat patients with SD? How do I tell a patient that I think their problem is mostly psychological and further dental treatment is uncalled for? This paper provides the dental practitioner with guidelines to address these questions.

What is Somatoform Disorder?

Patients presenting with OD frequently meet the criteria for Somatoform Disorder. They present with a history of excessive preoccupation with vague recurrent somatic complaints and specifically with a perception that their bite is not correct or "off" in the absence of collaborating dental/neurological evidence. This somatic focus and symptom

constellation is termed *somatization* and is the hallmark of the psychological disorder known as SD. The complaints are usually generalized but may have a single focus such as the patient's bite or cosmetic concerns. More recent conceptualizations of somatization refer to it as *health anxiety*⁴. When pathophysiology is present, the symptoms are in excess of what might be expected. The inexplicable complaints result in treatment seeking or *doctor shopping* and psychological, social and occupational impairment. Patients with SD incur healthcare expenses that are at least 6 to 14 times higher than the US average and result in enormous indirect economic costs due to lost work productivity^{5, 6}. Under the classification of SD, The Diagnostic and Statistical Manual- IV (DSM-IV) of the American Psychiatric Association (1994)⁷ defines several categories of somatization disorders. Table 1 lists the different SDs.

Table 1: Somatoform Disorders

1. *Somatization Disorder*: Historically referred to as *hysteria*, is a polysymptomatic disorder that begins before the age of 30 years, extends over a period of years and is characterized by a combination of pain, gastrointestinal, sexual and pseudo-neurological symptoms.
2. *Undifferentiated Somatoform Disorder*: Characterized by unexplained physical complaints lasting at least 6 months that do not exceed the threshold for the diagnosis of Somatization Disorder.
3. *Conversion Disorder*: Unexplained symptoms or deficits affecting the motor or sensory function that suggest a neurological or other general medical condition. Psychological factors are judged to be associated with the symptoms or deficits.
4. *Pain Disorder*: Pain is the predominant focus of attention. Psychological factors are judged to have an important role in its onset, severity, exacerbation, or maintenance.
5. *Hypochondriasis*: Preoccupation with the fear of having, or the idea of having a serious disease based on a persons misunderstanding of bodily symptoms or bodily functions.
6. *Body Dysmorphic Disorder*: Preoccupation with an imagined or exaggerated defect in physical appearance.
7. *Somatoform Disorder Not otherwise Specified*: Any somatoform symptom not meeting the full criteria for the other specific Somatoform Disorders.

Table 2 lists the general diagnostic features of SD as adapted from the DSM- IV.

Table 2: DSM-IV Diagnostic Criteria for Somatoform Disorder

The DSM-IV lists several categories of Somatoform Disorders. The following summarizes the key features for diagnosing Somatoform Disorder:

- A) One or more physical complaints (e.g., fatigue, loss of appetite, GI distress, urinary complaints, pain).
- B) Either i or ii
 - i. After appropriate investigation, the symptoms cannot be fully explained by a known medical condition or direct effects of a substance (e.g., drug abuse, a medication);
 - ii. Where there is a related medical condition, the physical complaints or resulting social or occupational impairment is in excess of what would be expected from the history, physical or laboratory examination;
- C) The symptoms cause clinically significant distress or impairment in social, occupational, or other important areas of functioning.
- D) The duration of the disturbance is at least 6 months.
- E) The disturbance is not better accounted for by another mental disorder (e.g., depression, anxiety, psychosis).
- F) The symptoms are not intentionally produced or feigned (i.e., malingering).

In general dental practice, the incidence of patients presenting with somatization is 8.7% with women making up 73% of those meeting the criteria for somatization⁸. Moreover, depression was found to be highly co-morbid with somatizing and this is consistent with other findings in the literature⁹.

Etiology of Somatoform Disorder:

Dental and Neurological Theories:

Dental and neurological explanations for OD that lead to effective treatments have been conspicuously lacking. Like phantom limb, frequently seen following amputation of a limb, Marbach¹⁰ hypothesized

that OD involves neural plasticity in the brain. He suggested that loss of sensation resulting from a peripheral sensory lesion secondary to dental treatment resulted in diminished input to the corresponding area of cortical representation. Thereafter, these cortical areas could be reactivated by adjacent neurons. Thus, the reorganized cortex would continue to infer occlusal changes even in the absence of peripheral input. Klineberg^{11, 12} has also proposed a physical etiology of OD. He suggested that OD is a result of centrally mediated occlusal hyper-awareness or *iatrogenic dysproprioception*. He further suggested that because of this hyper-awareness, OD patients were unable to re-learn necessary new jaw movements following even very small changes in their dental occlusion. However, the idea that these patients may exhibit heightened proprioceptive sensitivity has not received scientific support. For example, Baba et al, 2005¹³ found no differences in OD patients and controls in their sensory perceptive and discriminative abilities using occlusal registration foils in a thickness sensory discrimination test. Thus, it appears that rather than being more proprioceptively sensitive or having a *heightened awareness* the patient with OD is misinterpreting or over-interpreting normal occlusal sensations. Certainly more research is needed to understand the peripheral and central mechanisms that mediate the OD experience.

Psychological Theories:

Since dental and neurological evidence has been lacking to adequately explain the symptoms of OD, psychological theories have been proposed as etiological factors. Marbach¹ may have been the first to formally propose a psychological explanatory mechanism for OD, which he termed "phantom bite." Based on older psychodynamic concepts, he described OD as being a form of a rare psychiatric disturbance known as monosymptomatic hypochondriacal psychosis (MHP). MHP is characterized by a single delusion or unwavering false belief; in the case of OD, that something is wrong with their occlusion. The psychodynamic perspective further posits that OD represents a regression to an infantile narcissistic state in which patients withdraw emotional involvement from others and instead fixate on their physical symptoms^{1, 14}. They have a fixed and resolute belief that their physical symptoms are real and indicative of serious pathology. To date no empirical evidence exists to support this psychodynamic interpretation, nor has psychodynamic treatment proven to be effective in reducing somatization.

More recent cognitive-behavioral conceptualizations of SD have proven effective in terms of generating a heuristic model that has been successful in reducing somatization. It has not, as yet, been systematically studied in OD. However, research is on its way and the application of cognitive

treatments to other forms of SD shows much promise ¹⁵⁻¹⁸.

The cognitive-behavioral theory proposes that the tendency to misinterpret health-relevant information can be best understood in terms of the way in which knowledge of past experiences of illness (in self or others) leads to the formation of assumptions about symptoms, disease, health behaviors and the dental and medical profession.

Misinterpretation of ambiguous sensations, situations or stimuli as more threatening than they really are is central to the experience of SD and OD. The meaning that an individual attaches to a stimulus or situation is therefore crucial in generating OD. For example, OD patients are fixated on their belief that their symptoms are a sign of severe occlusal pathology; thus they perceive heightened threat or health anxiety and become pathologically preoccupied with these concerns.

The cognitive-behavioral theory further specifies that the impact of any misinterpretation leading to health anxiety is a function of the degree of *perceived threat* and that is in turn a function of four core factors ⁴: First, is the patient's *perceived likelihood of illness* and this interacts with the *perceived awfulness* or burden of the illness (this refers to general consequences such as loss of self-image and role, disturbance to loved ones, financial consequences, etc.). The other core factors are *perceived ability to cope* with the problem, that is, the extent to which the patient perceives themselves as being able to effectively control their symptoms and prevent them from worsening, and finally, the extent of *perception of external rescue* factors, or external medical and dental factors intervening to help or rescue the patient. This interaction of core factors determines the degree of health anxiety (perceived threat) and is represented in Table 3:

Table 3: Core Factors Determining Health Anxiety			
<i>Perceived Threat=</i> <i>(Health Anxiety)</i>	<i>Perceived Likelihood</i> <i>Of Illness</i>	X	<i>Perceived Awfulness</i>
	<i>Perceived Ability to</i> <i>Cope</i>	+	<i>Perception of External</i> <i>Dental/Medical Rescue</i>
Salkovskis and Warwick, (2001)			

Thus, it is possible for a patient to display a high degree of health anxiety about an orofacial condition with a relatively low *perceived likelihood of illness* but a high degree of *perceived awfulness* (i.e., "If I have cancer it will cripple me with pain and I will become physically disfigured and repulsive and a burden. I will be rejected by my colleagues and loved ones"). If one adds a high degree of *perceived likelihood of illness* to the mix then the results will be an *extremely* high degree of health anxiety. If the patient has poor coping skills and/or feels that the doctors are not listening or able to solve the problem, this also significantly increases the perceived threat. All four core factors need to be addressed in the formulation of any treatment program for patients displaying a high degree of health anxiety and potential SD.

Cognitive Treatment Strategies

Barsky Treatment Targets

Patients with SD perceive their symptoms as intense and noxious and there is variability in the degree to which these symptoms are perceived as bothersome^{19, 20}. Barsky²¹ using a cognitive-behavioral perspective has delineated four target areas for treatment that are important modulators of the intensity of a given symptom. They are *cognition*, *attention*, *context* and *mood*.

Cognition:

Cognition is an important modulator of physical sensations. We experience bodily sensations in terms of the information, beliefs, opinions and ideas that we have about them. Two patients with identical symptoms may have very different reactions based on their information, beliefs, opinions and ideas they have about their symptoms.

Attention:

Attention to symptoms amplifies them whereas distraction diminishes them. Patients who closely attend to their symptoms will experience a greater degree of these symptoms while those who manage to distract themselves will experience less intense symptoms.

Context:

Context furnishes clues that are used to infer the meaning and significance of bodily sensations. This influences how intense and noxious the symptoms are perceived to be. Context also influences perception by shaping expectations of future experiences. A patient who has had someone close to them die of oral cancer may be much more likely to be overly preoccupied with oral symptoms and convinced that they will

ultimately prove to be cancer.

Mood:

Depression, anxiety and other psychological factors may amplify bodily sensations. Anxiety, for example, results in perceived symptoms being more serious, dangerous and alarming. Depression, with its morbid self-preoccupation, can further amplify symptoms, resulting in an enhanced sense of hopelessness thus limiting the patient's sense of self-efficacy or control over their symptoms.

Cognitive treatment must focus on these targets in order to reduce the patient's symptoms.

Cognitive Treatment of Somatoform Disorder:

Cognitive-Behavioral Therapy (CBT) for somatoform disorder focuses on targeting cognitions, attention, context and mood. CBT treatment involves up to 10 individual sessions. The aims of the structured CBT approach, as adapted from Allen ¹⁵, are shown in the following Table 4:

Table 4: Aims of Cognitive-Behavioral Therapy for Somatoform Disorder:

1. Reduce physiological arousal and reactivity through relaxation and mindfulness techniques.
2. Enhance activity regulation through increasing exercise and pleasurable and meaningful activities; teach pacing skills.
3. Increase awareness of emotions; teach emotional regulation and tolerance of distress.
4. Modify dysfunctional beliefs through cognitive re-structuring.
5. Teach distraction approaches.
6. Enhance communication of thoughts and emotions
7. Reduce spousal reinforcement of illness behavior.
8. Address co-morbid mood disturbance.

Occlusal Dysesthesia Case Presentation:

Case History

Mrs. X, a 61 y/o married Caucasian female, was referred to the Orofacial Pain (OFP) Clinic for evaluation of her bite. She was obviously in a lot of distress, angry and anxious and indicated that her bite had been changed by several dentists and she no longer knew where her teeth should meet. As she sat in the examination room, she was intermittently clenching her teeth. She stated that she was doing this to *check the bite*. She reported that the problem developed when she went to a TMJ doctor regarding jaw pain. The TMJ doctor recommended that she wear a TMJ appliance full time for 1 month and then she would need some restorative dental work done to fix her bite. She stated that her pain levels had decreased with the use of the appliance but that only her anterior teeth contacted when the appliance was removed. She reported that the TMJ doctor then made crowns and bridges to restore the bite but she felt that the bite was not right and returned to have the bite adjusted. After several attempts to get her bite adjusted, the dentist referred her to a colleague for evaluation. The colleague reevaluated her bite and recommended that the crowns and bridges be removed and redone. This was done but she continued to report bite discomfort. After several visits to have the new dental work adjusted, she went to another dentist on her own. The new dentist evaluated the work and told her one of the bridges would have to be replaced since it had been ground down to a point that the metal was showing through the porcelain and the bridge was out of occlusion. This dental work was also redone but the patient continued to complain of her bite being off. She saw a 4th and 5th dentist both of whom tried to adjust the bite but without resolution of her complaint. By this time, she had spent several thousands dollars to get her bite comfortable. She would go to the dentist, have him adjust a specific tooth and feel that it was now normal, then leave only to find when she returned home that another area was now "off" and needed to be adjusted. The same routine occurred with all of the dentists.

In the OFP clinic, when the patient's bite was checked with Mylar, there were no obvious premature contacts and in fact, several of the areas where she complained that contact was too hard were out of occlusion from previous adjustments. The patient was told that there was nothing wrong with the bite and that she should stop checking it. She would listen to what was being said, then immediately come back to her mouth and say, "But this area here is meeting too soon and needs to be adjusted." When the area or tooth was checked and no premature contacts were noted, the doctor would inform the patient and she would listen, then immediately point to another area that she felt needed to be adjusted.

Physical Examination

The examination of this patient included a stomatognathic assessment

looking for TMJ function, a palpation examination looking for joint pain, muscle tenderness and myofascial trigger points. There was mild to moderate tenderness over the lateral pole of the right TM joint and there were myofascial trigger points in the masticatory muscle bilaterally. Mild crepitus was noted bilaterally in the TM joints. Tongue/cheek ridging was moderate to severe, indicating parafunction. The neurologic examination was grossly intact.

Since in the first session the dentist observed that the patient was showing signs of anxiety, depression and extreme obsessive somatic focus and parafunction, she was referred to a health psychologist for a psychological evaluation prior to pursuing any dental or pharmacological interventions. The patient was informed that no treatment would ensue until the psychological evaluation was completed. She was informed that this was a standard and important component of the comprehensive evaluation process that all patients with occlusal dysesthesia and orofacial pain underwent in the OPC. She became very upset with the idea of seeing a psychologist for her *real* occlusal problem and that the dentist thought it *was all in her head*. The dentist reassured the patient that he did not think her problem was *all in her head*. He reiterated that all patients with occlusal dysesthesia and orofacial pain underwent such an evaluation because he understood the tremendous impact that such problems can have on patients and their families. He further stated that he could see how distressed she was about her problem and the toll it had taken on her and that there were psychological approaches that could help control her symptoms safely and reverse the negative impact that the occlusal dysesthesia was having on her. He discussed the role that her occlusal symptoms can have in creating distress, anxiety and depression leading to increased muscular tension and how the muscular tension could in turn increase the distress, creating a vicious cycle. The dentist also discussed the important role that masticatory muscle tension has on the perception of occlusal problems and that the psychologist has relaxation and biofeedback techniques that may be beneficial in reducing this tension as well.

Psychological Evaluation

The patient underwent a one hour clinical consultation with a health psychologist. Several psychometric tests were administered. These included the MMPI-2 (Minnesota Multiphasic Personality Inventory); The Beck Depression Scale-2 (BDI-2); Beck Anxiety Scale; The Whiteley Index. The MMPI-2 accurately portrayed the patient as exhibiting extreme somatic focus and illness conviction with severe depression and obsessive-anxiety and an intense interpersonal style. The patient displayed poor coping resources and thought processes that were bizarre, if not mildly delusional, though not meeting the criteria for a Psychotic

Disorder. The MMPI suggested that the patient's OD symptoms were used to modulate her significant underlying emotional distress. Thus somatization was extreme. Her symptoms also served to remove her from stressful psychosocial responsibilities and a life-long pattern of interpersonal conflict secondary to passive dependent personality traits and labile and frequently irritable mood. In actuality the symptoms seemed to be serving the purpose of *reducing* the patient's overwhelming emotional distress by substituting a less threatening and stressful symptom, i.e. the OD. The other psychometric tests and clinical interview supported the MMPI-2 findings.

Several psychological recommendations were made by the health psychologist based on the psychological interview and testing results:

1. Patients with similar profiles are severely prone to side-effects to medications and are poor interventional candidates. Therefore, avoid interventional treatments, occlusal adjustments, etc, and carefully enter into any medication trial if indicated.
2. The patient may benefit from a psychiatric evaluation for psychotropic medications to deal with their depression and labile mood. Specifically a Selective Serotonin Reuptake Inhibitor (SSRI) such as sertraline, citalopram or escitalopram or a Serotonin Norepinephrine Reuptake Inhibitor (SNRI) such as venlafaxine or duloxetine. The latter have proven more effective in pain management than the SSRIs but the SSRIs have superb anti-obsessional properties. The labile mood and bizarre focus may also respond to an antipsychotic such as aripiprazole or ziprasidone. This, however, should be considered a last resort and only after an adequate trial of the antidepressant fails to yield adequate results. Side-effects will be the limiting factor with respect to medications, thus *start low and go slow* with the medications and prescribe them in a *sequential* rather than simultaneous manner. Finally it is suggested that benzodiazepines be avoided since these patients have a tendency to rapidly become dependent on them.
3. The patient should be referred to a health psychologist and provided with CBT to enhance coping resources, be taught cognitive restructuring, distraction and relaxation and stress management techniques. In addition the focus of cognitive therapy should be to teach the patient emotional self-regulation, tolerance of phantom sensations and more adaptive interpersonal skills.
4. Consider Electromyographic (EMG) biofeedback of masseter muscles in order to relax the jaw.
5. Strict limits should be set with respect to the dentist's time with the patient, in answering phone calls, responding to letters or emails and discussing medications.
6. No further dental treatment for the OD is recommended. If treating co-morbid pain or dental pathology is indicated then this should be done

slowly and with great care since they may worsen OD symptoms.

Treatment/Results

The dentist and psychologist devised a comprehensive treatment plan to treat the musculoskeletal issues and SD. On the first treatment visit, following completion of her psychological evaluation she was given instructions for the N-position stretch and N-position rest exercises and told that this would become her focus. These stretches were to be done 6 times per day. In addition, she was told to do an extra set of stretches if she caught herself checking her bite at anytime during the day. The relationship between the tight muscles guiding the bite and stress were explained to her.

On the subsequent visit, the patient indicated that there had been no change in her bite. On questioning her about this, she indicated that she was doing the stretches but that she would still occasionally check the bite to see if the treatment was working. She was asked to demonstrate the exercises and it was apparent that she was doing them incorrectly and was not taking the time to stretch out the tight muscles. The patient was praised for doing the stretches although incorrectly and was reinstructed and encouraged to continue. In addition, she was instructed to go out in public, e.g. to the mall on a daily basis and/or do an aerobic walk for 10-15 minutes each day—always actively keeping the teeth apart and avoiding tooth to tooth contacts.

The patient underwent 6 one-hour CBT sessions with the health psychologist using the protocol described above. She was also provided with EMG biofeedback to relax her masseter muscles during these sessions. After 3 visits and ongoing work with the psychologist, the patient came to the clinic and when questioned, indicated that her bite was starting to come back to normal. She was again instructed to continue the exercises and avoid checking the bite. She was given more encouragement and it was apparent that her mood and focus were beginning to change.

She was seen 5 times by the dentist over a 2 month period and was then discharged from active treatment. No psychotropic medications were prescribed. Her mood improved dramatically as did her symptoms. She rated her OD as having a 95% improvement at a one year follow-up. She will go for a week without thinking to check her bite and she reports that what symptoms she does have do not cause distress.

Discussion:

We have attempted to provide the reader with not only an overview of the diagnosis and treatment of occlusal dysesthesia (OD), but also a feel for the nature and challenges that these patients present with to the dental practitioner. Table 5 lists Red-Flags for the dentist alerting you that a patient may have OD.

Table 5: Red-Flags for Occlusal Dysesthesia

1. Reporting severe bite/occlusal symptoms that do not make scientific, anatomical or dental sense and are seemingly overly disabling.
2. Showing significant obsessive somatic focus.
3. Emotional distress that is in excess of what might be expected.
4. Patients who bring in detailed histories of their problem and of prior treatment failures.
5. Patients who are angry at their prior dentists.
6. Patients who are overly ingratiating towards you, your reputation and their expectations of you.

As stated previously, the focus of treatment is not dental but behavior change since dental treatments have proven ineffective in OD and frequently result in iatrogenic complications. Never-the-less dentists continue to make the mistake of targeting the occlusion in an attempt to *fix* the bite when a patient presents with concomitant pain, TMD and bite changes. Indeed, the perfect bite probably does not exist.

Current treatment based recommendations from the leading OFP programs around the country advocate not adjusting the bite unless there is a direct correlation between bite changes and *very* recent restorative dental work. Moreover, it is now widely accepted in the scientific community that TM disorders generally are not related to the bite or cuspal interferences but that disease or tender-tight muscles affect or alter the bite²²⁻²⁵ The recommendation therefore is to work with the muscles to get them to relax, prior to adjusting the bite unless there is a direct correlation between the bite complaint and recent dental work. Furthermore, there are other conditions that can alter bite, such as degenerative changes in the TMJ due to osteoarthritis or rheumatoid arthritis, acute inflammation of a TMJ and lateral pterygoid trismus. Rushing in to do an occlusal adjustment in these cases would not solve the primary etiology of the bite change, and would divert attention away

from proper evaluation and treatment. When the dentist becomes focused on the bite this can further reinforce the patient's somatization and create more difficulty in treating the patient.

To date there are no dental models of OD that have pointed to effective treatments. We propose a multidisciplinary biopsychosocial model that suggests the etiology resides in an obsessive misinterpretation of normal occlusal events as indicative of pathology as a result of Somatoform Disorder. We propose specific physical medicine and psychological strategies to effect behavior change and reduce the OD complaints and somatization that maintains the OD experience.

The Biopsychosocial Model of Occlusal Dysesthesia:

The bite is guided by the closing muscles of the jaw. Occlusal studies and anecdotal observations show that the bite shifts throughout the day, depending on a number of factors such as conscious or unconscious jaw posture and muscle tension. Stress can increase baseline EMG muscle activity, resulting in shortening of the muscle fibers. The heightened tightness in the closing muscles affects the way the teeth come together, causing slight premature contacts on one side or the other. These premature contacts tend to change and/or resolve throughout the day and go largely unattended to by the vast majority of people. However, because of their SD, patients with OD become alarmed at these changes especially if they occur in close association with recent dental work. This enhances the perceived threat and somatic focus. The alarmed focus can then cause shortening of the closing muscles independent of the matching muscles on contralateral side of the jaw, with the result that the jaw shifts slightly and the bite is now perceived as *off*. When the patient checks the bite over and over, this behavior confirms and recharges the alarm mechanism and kindles the patient's somatic focus and health anxiety. If the patient goes to a dentist to have the bite adjusted, the fact that the dentist listens to the patient and attempts to alleviate the problem can lead to a decrease in stress resulting in immediate relaxation of the muscles and normalization of the bite (See Table 3). Thus the dentist is seen as a miracle worker and the patient leaves, satisfied that the dentist has solved the problem. However, within a very short time the patient, out of an over-learned habit or for fear that something may have been missed, has to recheck the bite to confirm that it is still normal. As this occurs; the muscles begin to tighten again, causing a slight shift in tooth contact. Anxiety and distress increase and the patient begins desperately checking to see if it is just their imagination but again the bite is off, requiring an immediate or subsequent visit to the dentist. Thus the dentist who persists in focusing on the bite becomes part of the patient's problem, confirming their alarmed focus on the bite, re-priming the alarm reaction each time adjustments are made and reinforcing the patient's

somatization and health anxiety. These patients are not responding to an abnormal event but to normal changes in their bite that occur in everyone throughout the day. Rather, as a result of a SD they are misinterpreting and amplifying normal sensations. They are obsessively focusing and somatizing on these normal changes in the bite which enhances their health anxiety and illness conviction. This focus is driven by their *cognitions* (beliefs, opinions and ideas about their sensations); *attention* to their bite (and lack of ability to distract themselves from focusing on their bite); the *context* which furnishes them clues to decide the meaning of and significance of their sensations, and finally their *mood*. The anxious or depressed patient will exhibit heightened somatic focus and sensations as well as exhibiting poor coping resources needed to tolerate their distress. As we have emphasized above, the treatment of choice is behavioral change not dental. We instead propose that the treatment for OD involves CBT and physical medicine/stretching modalities targeting the facial muscles and relaxation and not occlusal adjustments. Co-morbid physical and psychological symptoms may also need addressing.

Based on our biopsychosocial model we propose the following specific treatment strategies for OD:

1. Dentists attempting to treat OD using rational counter arguments will become entangled in protracted debates which are doomed to failure. Do not try to convince the patient that nothing is wrong with their bite, but rather present the model described above.
2. The treatment needs to be structured and time-limited to six to eight visits with an emphasis on behavior change through self-management modalities. The patient needs to understand that symptom reduction will occur only through their actions and efforts and not those of the dentist or psychologist. This will involve physical medicine modalities targeting the musculoskeletal system and also CBT and relaxation.
3. Obtain informed consent regarding each step of treatment.
4. The patient should be referred to a health psychologist for assessment of Somatoform Disorder. CBT and relaxation may need to be initiated before the physical medicine modalities. The psychologist will determine if the patient should be referred to a psychiatrist for psychopharmacological management to help manage co-morbid psychological problems such as depression and anxiety. It may be important to treat the co-morbid psychological disturbances first before embarking upon the physical medicine component.
5. The dentist should not attempt to treat the bite complaint with occlusal adjustments before working with the tight and/or painful muscles. If the patient has a night guard or splint you may check the bite but do not adjust it unless it is obviously in need. Contacts should be even over the surface of the appliance. Once this is achieved do not readjust it. Remember that adjusting the bite *feeds* the somatization and shifts the patient's attention to their bite and splint.
6. The role of the dentist in this process is to help the patient detach the bite from their obsessive focus by helping them to alternatively focus on

something that is beneficial for them, such as doing jaw stretching throughout the day and maintaining a jaw posture where the teeth are not touching. Their symptom thus becomes a cue to engage in adaptive coping behaviors.

7. The patient should be given a daily diary to remind them about the jaw stretching and jaw posture. The jaw stretching exercise is usually a simple jaw stretch with the tongue place on the palate behind the maxillary incisors and stretching as wide as possible in this position, while not allowing the tongue to come off of the palate. The tongue serves to limit the opening, avoiding the possibility of overstretching that an obsessive person might do. These should be done 6 times in a row; at least six times a day and held for six seconds each (termed *6 X 6 X 6 exercises*).
8. The patient should maintain the jaw posture when not functionally using the jaw to eat or speak and to try to maintain a *relaxed* jaw position. The posture requires the tongue to be placed in the same position as used in the jaw stretch but the teeth are kept apart and the lips are together (the *N-rest position*).
9. The patient is instructed not to check their bite or allow their teeth to come together. If they find that they are checking the bite they are to do an additional set of stretches and go back to the N-rest position. Another strategy involves having the patient snap a rubber band placed around one wrist when they find they are checking their bite. This provides negative feedback and a cue to affect the behavior change.
10. The patient should be given positive feedback for their attempts to comply with the recommendations and encouraged to persist if they fall back. However, don't get manipulated into adjusting the bite, "just one more time."
11. The prognosis is poor for continued dental treatment, but is not poor for enhancing the patient's ability to cope effectively with their problem and improve their mood, functioning and quality of life. Thus, set strict limits but do not be judgmental with these patients. They are suffering and deserve a supportive and reinforcing environment to successfully affect their behavior change.

The bottom line message to the patient is that further occlusal adjustments or dental interventions will not yield favorable results and may in fact worsen their symptoms. They need to understand that only by taking control through the application of self-management physical medicine and cognitive-behavioral modalities will they be able to improve their symptoms and enhance the quality of their lives. Not all patients are going to respond to treatment, depending on the severity of their disorder and co-morbid physical and psychological conditions, but working with a clinical health psychologist using CBT can optimize the outcome. It is imperative for the dentist to partner with a clinical health psychologist who has expertise with CBT when deciding to treat a patient with OD.

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