



## A FREEDOM ALTERNATIVE TO THE CONSEQUENCES OF BRUXING

DIGITAL COPY DENTURE FABRICATION  
FOR A BRUXING/CLENCHING PATIENT

*Be a Superhero to Your Patient*

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### INTRODUCTION

Often, we encounter patients who exhibit bruxing/clenching habits, which can cause premature wear of the denture teeth. Treating this condition is difficult and frustrating as treatment options can be uncomfortable or expensive if dentures require replacement more frequently. An opportunity arose to challenge me to consider an alternative treatment option and craft a digital copy denture to address possible premature wearing of a denture due to suspected bruxing. The combination of traditional experience with emerging digital technology provided inspiration to 'get out of one's own way' and, ergo, challenge professional complacency. This article explores the treatment option of how to manage the consequences of bruxing/clenching, not the causes associated and how to prevent them.

### PATIENT CASE

An existing patient to the office presented for a recall appointment with an approximate two-and-a-half (2.5) year old complete upper denture to natural lower dentition. Having been a patient for many years, she has exhibited bruxing/clenching tendencies, which have been present for decades. Many treatment options during her life have been explored with limited or no success. These treatments have included hard and soft maxillary and mandibular splints, meditation, medications, and hypnosis. The patient has learned trigger points which influence her bruxing and has also accepted the premature wearing of the denture teeth and, ergo, more frequent denture replacement. She must always wear the denture at night for temporomandibular

joint support. Considering her condition, the existing denture was crafted with VITA Excell Anteriors and Lingoform Posteriors. These teeth were chosen for esthetics, material durability (acrylic-glass), and Freedom in Centric design. A more detailed explanation is to follow. Although the denture was performing well during her recall appointment, slight premature wear was noted, and discussions began on pre-emptive options. Prior to her becoming a patient, her previous dentures had been crafted from acrylic teeth, were well worn within a few years and fractured often. The current VITA product used in her denture was performing well and much better than acrylic teeth have. Since the option was now available, the decision was made to craft a digital copy of the existing denture, which she would wear at night or in trigger point situations. The thought was

to have the copy denture bear the brunt of the consequences of bruxing/clenching and not the 'good' denture. The existing denture was scanned using 3Shape and a copy made from Dentca tooth shade printable resin. This material was chosen with the expectation that it would be more durable than acrylic.

### TREATMENT PLAN

In drafting the treatment plan, the copy denture would not be enhanced as the current denture was performing well. It functioned, fit, was comfortable, had not fractured, and was not causing any issues to the supporting structures as in previous dentures. The copy denture was to be worn and night or in trigger point situations.

### BACKGROUND INFORMATION AND THEORY

**Existing denture teeth:** Standard denture available and used in most dentures are either functional, 10, 20, or 30-degree variety with working and balancing cusp concept. However, the teeth are locked into a centric position and have no freedom in centric. Yes, they work and balance, but there is no 'wobble-room' in centric. In cases of single dentures, these denture teeth are ground into the natural teeth to achieve maximum contact and overlap and have no freedom in centric.

**Freedom in Centric:** Freedom in centric is defined as "A flat area in the central fossae upon which opposing cusps contact, which permits a degree of freedom (0.5-1 mm) in eccentric movements uninfluenced by tooth inclines (Schuyler CH. Freedom in Centric. Dent Clin North Am. 1969;13:681-686.)." All natural dentition have this concept, yet only a very few specific denture teeth available have it incorporated.

**Why Freedom in Centric is Important in Dentures:** This concept is important as denture teeth have no nerves. As such, a patient cannot feel when the teeth occlude or if they occlude properly. The important fact to remember is that there is food between the teeth during chewing, and it is not possible to achieve perfect centric contact each and every time like we can achieve on an articulator during fabrication. What compounds the issue is that dentures

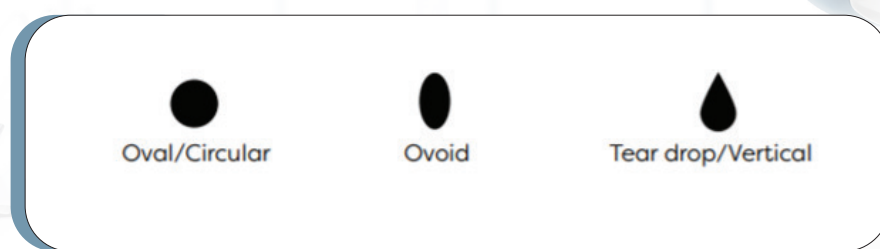


Figure 1

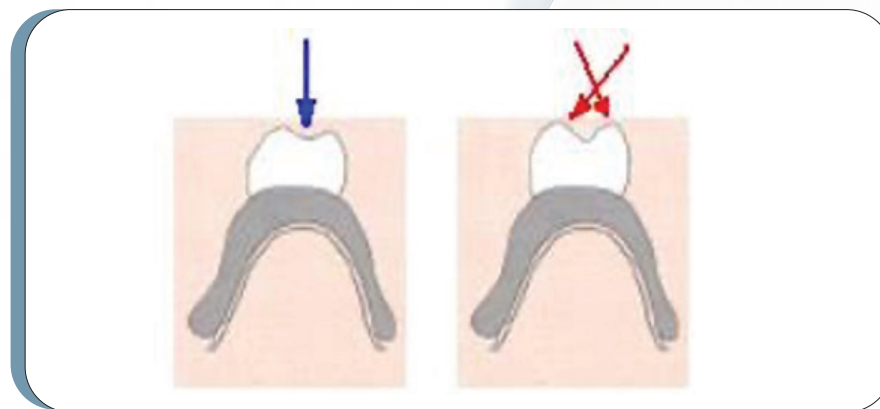


Figure 2

“ IN DRAFTING THE **TREATMENT PLAN**, THE COPY DENTURE WOULD NOT BE ENHANCED AS THE CURRENT DENTURE WAS **PERFORMING WELL**.

are subject to moving as they fit against soft tissue. Combine these points, and it is not conceivable to think a denture patient can achieve perfect centric each time. This provides a reason as to why natural dentition has freedom in centric, even though we can feel our teeth, as it is not possible to achieve perfect centric each time we chew. With this in mind, the concern is the working cusps hitting the corresponding guiding planes and sliding into position. The hit and slide aspect is a source of denture issues and ill fit. When present, because the patient cannot directly feel it, they will try to grind away the offending contact exasperating the bruxing/clenching condition. This is also often misdiagnosed. Freedom in Centric thus provides stability to dentures.

**Why Freedom in Centric was Important in this Treatment:** In considering the upper denture rests against soft tissue and opposes a more rigid natural dentition, it is subject to dislodging forces. Combine this with the patient's neurological impulse

to brux/clench; functional occlusion becomes paramount. Functional in that there are no hit and slide contacts occurring within function to act as a trigger for bruxing/clenching. Freedom in Centric was incorporated into the current denture to eliminate the occlusion as a trigger cause. Part of the reasoning was that the denture should 'do no harm.' The theory concept of this occlusion is that the teeth do not appear 'knuckle tight' as one would usually expect. It was of open concept, free in centric, and free within function.

**The Patient Chew Cycle:** A patient chews in a teardrop pattern, and is unique to each individual. Some patterns are more horizontal, others more vertical. See Figure 1.

The cusps, especially the non-working cusps of buccal and lingual lower, must not interfere while functioning within the chewing cycle of the patient. If there is interference, the cusps hit and then slide into position. As discussed previously, this hit and slide cannot be felt by the patient. See figure 2.



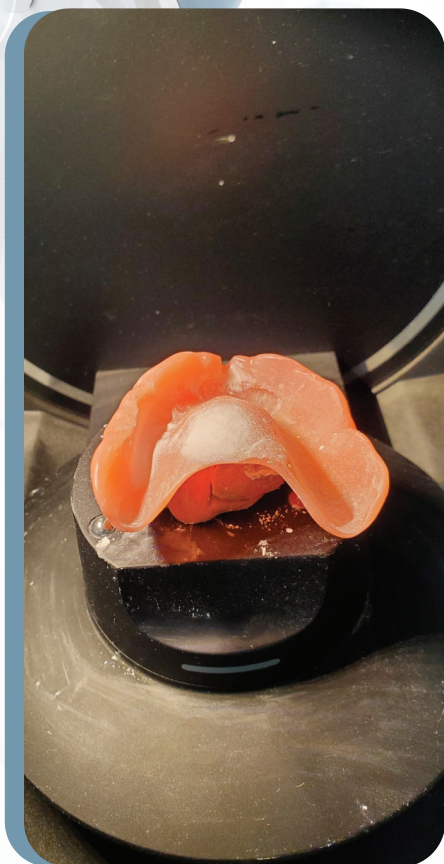


Figure 3: The denture within the scanner

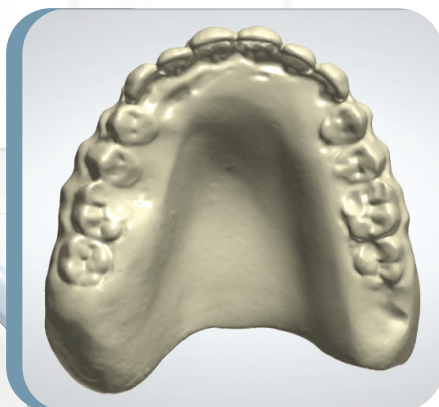


Figure 4: Scan

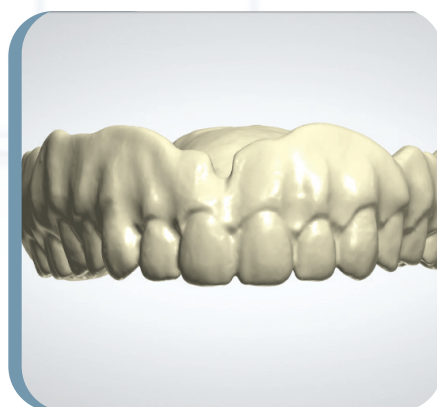


Figure 5: Scan

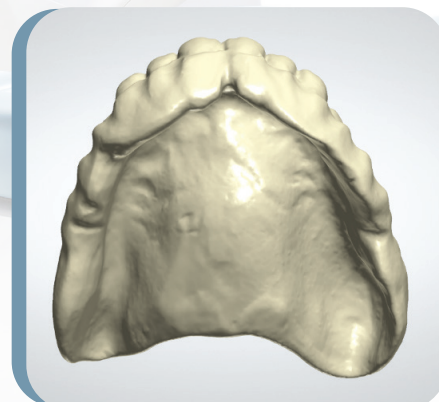


Figure 6: Scan



Figure 7: The existing and copy denture



Figure 8: The existing and copy denture



Figure 9: The existing and copy denture

### THE DIGITAL DESIGN

The existing denture was scanned and then designed using 3Shape.

The copy denture was inserted and checked. As it was a replica of the existing, no refinements were necessary. Upon follow-up two, four, and eight weeks post-insertion, the patient was wearing the copy denture as instructed, and no discomfort was reported.

### KEY TAKE-AWAY POINTS

- Freedom in Centric designed occlusion, regardless of fabrication or platform used, provides denture stability and flexibility.
- The hit and slide on the guiding planes of cusps is the primary cause of common denture issues.
- Managing the hit and slide contacts provides a stable fit and, in this

situation, control of bruxing/ clenching. The denture is not acting as a trigger or causing bruxing/ clenching as the patient is not trying to grind away an interfering contact.

- A "Freedom in Centric" copy denture is proving useful as a positive and affordable treatment option in bruxing/ clenching patients.

## CONCLUSION

Patients often look to us to be their superheroes. In some situations, this can be a daunting task given treatment modalities. The combination of traditional experience with emerging digital technology provided inspiration to 'get out of one's own way' and, ergo, challenge professional complacency. This article explored a 'new' and trending treatment option for managing the consequences of bruxing/clenching. Freedom in Centric is the ability to move within centric contact, thus not locking in a 'bite.' This phenomenon is only incorporated in a few denture teeth and allows for flexibility in setup arrangements to suit patient requirements. Understanding this theory provided confidence to explore this digital copy denture treatment plan. We, as denture professionals, do not slap teeth together as we strive to be a superhero to our patients. The type of teeth you use matters in traditional or digital fabrication as we strive to 'do no harm,' so please seek out and consider Freedom in Centric posterior teeth. "Freedom is Good!"

Marc wishes to thank his patient, VITA, Aurum Lab Calgary, and Jason Atwood from core3d Calgary. 🦷

“ **FREEDOM IN CENTRIC** WAS INCORPORATED INTO THE **CURRENT DENTURE** TO ELIMINATE THE **OCCCLUSION** AS A TRIGGER CAUSE. PART OF THE REASONING IS THAT THE DENTURE SHOULD **DO NO HARM**.

**Marc Wagenseil** is a licensed denturist and dental technician with 35 years of direct patient care. He is a specialist in the field of oral biology, including the prosthetics that function within. A key opinion leader and subject matter expert, Mr. Wagenseil has lectured extensively on oral biology, anatomy, biological chewing function, biomechanics, and prosthetic (implant and digital supported) design and fabrication, providing hands-on, in-depth education internationally. As the owner of Heritage Denture Centre and Heritage Dental Lab in Edmonton, AB, Canada, he has spent his career focusing on how dentures integrate in the mouth and body and inspires a unique awareness of occlusion and professional growth. Mr. Wagenseil also provides professional consulting services on dental prosthetics and treatment services related to improving technical, marketing, and education activities.