



# A Simple & Functional Conservative Treatment

## Occlusal Risk Diagnosis of a Constricted Chewing Pattern

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### Abstract

Determining occlusal risk is an essential step in managing treatment with predictability and success. The three parameters of occlusion as defined by Dr. John Kois are the position of the joint, the way the teeth fit together in the posterior, and the pathway or guidance of the teeth in the front.<sup>1</sup> Identifying a patient's clinical issues is just one aspect of treatment. It is important to ask patients certain key questions to help determine the diagnosis. The case discussed here focuses on the occlusal risk diagnosis of a constricted chewing pattern and a simple, conservative treatment option.

**Key Words:** constricted chewing pattern, risk assessment, occlusal parameters, functional diagnosis, minimally invasive

## How a system appears and how it actually functions can be completely different.

### Introduction

Some patients present with what appears to be ideal occlusion, yet they have discomfort, or even pain. How a system appears and how it actually functions can be completely different. As clinicians, we are faced with how to alter a system that looks correct in order to make it function correctly. We also have the challenge of treating these patients with minimally invasive dentistry to achieve the desired results.<sup>2</sup> A constricted chewing pattern is one in which some or all of the front teeth are positioned in the envelope of function. Patients with this problem adapt either by wearing down their front teeth (which presents clinically as thinning of/chipping to the incisors), or by using their muscles to position the jaw more distally to avoid tooth contact, which presents as sore muscles or joint pain.

Anterior tooth wear may be stable (i.e., adaptation is complete), or the adaptation may still be occurring. By asking patients some of the following questions, the clinician can confirm an occlusal diagnosis of constricted chewing pattern and whether the system is actively breaking down:

- Do your jaw muscles get tired after speaking for long periods of time?
- Do you have difficulty chewing gum, carrots, nuts, bagels, baguettes, protein bars, or other hard, dry foods?

A “Yes” response tells the clinician that the process is still active, but a “No” requires further investigation to determine whether the patient has learned to avoid certain foods (e.g., no longer chewing gum because it hurts their jaw muscles; or no longer eating meat—not because of dietary requirements or beliefs, but because chewing meat is simply too difficult or uncomfortable) as a form of adaptation.<sup>3</sup>

Treating a constricted chewing pattern means allowing enough freedom in the anterior for the envelope of function. The chewing envelope can be evaluated by sitting the patient up and having him or her chew on a piece of gum with 200- $\mu$  articulating paper. All streaks to the linguals of the maxillary centrals/laterals and facials of the lower mandibular centrals/incisors are areas of interference in the envelope of function. If the constriction is very small it can sometimes be handled by adjusting the inclines of the anterior teeth, but often it requires significant alteration to allow the room to function. Creating that room between the anterior teeth involves either

- moving the maxillary anterior teeth more facially
- moving the mandibular teeth more lingually
- opening the vertical dimension of occlusion.

Factors such as length of treatment time, cost, and invasiveness all play a role in determining the treatment.<sup>4-5</sup>

### Case Presentation

A 40-year-old female presented with chief complaints of temporomandibular (TMJ) pain and difficulty with eating certain foods. She had learned to eat very slowly and carefully and had modified her diet accordingly for many years. The patient had received orthodontic treatment as a teenager that included extractions of the maxillary first premolars with space closure.

Clinical examination revealed slight wear on the linguals of the maxillary anterior and facials of the mandibular anterior teeth. There was lack of wear on the posteriors, which suggested the patient’s inability to chew on her back teeth, and most of the friction was occurring on the anterior teeth. This observation, combined with her muscle symptoms suggested a constricted chewing pattern. The overall treatment goal was to decrease the risk of further attrition and change the functional relationship of the anterior teeth with minimal biomechanical risks.

The following steps outline how a constricted chewing pattern was corrected with a simple and conservative treatment.

The patient’s medical history was non-contributory. Her dental history revealed no restorations and her periodontium was healthy. Her maxillary first premolars had been extracted when she was a teenager; this had created an arch discrepancy. Her immediate concern was the TMJ pain she experienced daily.



The patient had a Class I canine and Class II molar relationship as a result of previous premolar extractions. Due to over-retraction of the maxillary anteriors during the space closure, the patient had limited space in the anterior to freely function without interfering restriction. She had learned to avoid the friction in the anterior by posturing her jaw back, but this created muscle fatigue and pain. This observation, in conjunction with the retroclined position of the upper centrals and the attrition as evidenced by contact pattern of the anterior teeth, suggested a constricted chewing pattern.



Creating room in the anterior was accomplished with orthodontics. The goal was to position the teeth to accommodate minimally invasive restorations of ideal height-to-width ratios, change the functional relationship of the anterior teeth, and decrease the risk of further attrition. It was decided to move the maxillary anterior teeth more facially to gain that room. An alternative choice of treatment without orthodontics would necessitate opening the vertical dimension with restorations. This would involve less treatment time but the amount and cost of dentistry would be significantly greater.<sup>6</sup>



Orthodontic treatment was completed after 14 months. Spacing was not ideal but the functional relationship of the anterior teeth had been altered to achieve a functional envelope free of constriction and the patient was comfortable and eager to move forward with treatment. The centrals, laterals, and canines were all narrow in width, with the laterals having the most significant height-to-width discrepancy.<sup>7</sup> The position of the teeth could now accommodate restorations of more ideal tooth contours.<sup>7-9</sup>



Shade selection was done to evaluate both dentin and enamel replacement. Most of the composite would replace enamel but some dentin shades had to be used to prevent show-through of the negative space.<sup>10-12</sup>



Final direct composite bonding to interproximals of teeth #6-11 was accomplished. With limited orthodontics and no-preparation direct composite bonding, the final outcome was esthetic and natural-looking while resolving a debilitating issue that the patient thought could never be cured.



## Summary

Making an occlusal diagnosis and understanding how to utilize specific parameters allows for a predictable treatment protocol. In constricted chewing patterns the position of the joint may be the problem at hand, but treating the case requires knowledge of how the teeth fit together in the posterior segment of the mouth and the pathway for guiding the system from the outside in. This can be done only after first determining the patient's dento-facial esthetics.<sup>13-15</sup> Understanding these principles allows the treatment options to be easily presented to the patient based upon what their specific desires may be.

## References

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