Why Occlusal Wear is Commonly Ignored

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In a restorative practice there often is a large percentage of patients that require complex reconstructive dentistry because of advanced attritional wear. The reality is that most of those patients could have prevented the destruction of their occlusal surfaces if their dentist had been aware of the causes of wear and were observant of early signs when further progressive damage could have been prevented. Yes... attritional wear is almost always preventable.

Causes of Wear

There are several causes of wear. The most common belief is that wear is caused by bruxism, especially if the person is under stress. This is a very narrow viewpoint that completely misses the most essential factor that is required for attritional wear to occur. That is the presence of tooth inclines that interfere with mandibular border paths. These interfering tooth surfaces may be on either anterior teeth or posterior teeth but posterior interferences are, by far, the most common. Anterior tooth interferences are almost always caused by erroneous dental treatment that constricts the envelope of function or interferes with centric relation.

Before discussing wear problems in more detail, we should clarify that attritional wear occurs when teeth wear against each other without benefit of an abrasive between them. Attritional wear requires teeth to be in the way of how the jaw moves.

We must recognize that chemical wear can also be a causative factor that may be unrelated to occlusal interferences. And we must also observe when abrasive wear is accelerated by occlusal interferences.

It is impossible to understand either the cause or the prevention of attritional wear without first understanding the biomechanics of mandibular function including the role of centric relation and anterior guidance. An examination is incomplete if it does not look for occlusal interferences plus observing any signs of wear or instability related to those interferences.
Causes of Attritional Wear on Front Teeth

1. **Posterior Interferences:** When you see wear on the lingual surfaces of the upper anterior teeth, the first place to look is for incline interferences on the posterior teeth... by far the most common cause of anterior wear. It occurs as the mandible is forced forward from centric relation as the jaw closes into posterior tooth inclines that drive the lower anterior teeth into the upper anterior teeth. Eliminating the posterior deflective inclines allows the jaw to close back into maximum intercuspation in centric relation without being forced forward into heavy anterior contact. It is an all too common mistake to grind on heavy anterior contact without first checking to see if the problem is caused by posterior incline interferences.

2. **Restriction of the envelope of function:** The anterior guidance is critical to long term stability of the entire dentition. I’d have to copy the entire text from several chapters in my book to do it justice because an understanding of anterior guidance is dependant on first understanding *centric relation* (the starting point for anterior guidance). Other critical factors include the *neutral zone* that dictates the position and inclination of the anterior teeth; *functional smile design* that shows how to precisely determine incisal edge positions which must be achieved before the *envelope of function* can be determined so the *anterior guidance* can be worked out in perfect harmony.

Treating Anterior Teeth

Two things you must know for predictable success in treating anterior teeth are:

1. **Incisal edges too far lingually** interfere with the envelope of function. This is a serious mistake that almost without exception leads to instability via excessive wear, hypermobility, or migration of anterior teeth. The two most common causes of restricted anterior guidance are 1. improper orthodontics or 2. improperly contoured anterior restorations. We just do not see a restriction of the envelope of function occur without help from a dentist. One exception can be a traumatic injury.

2. **Incisal edges too far labially:** This is not as problematical as restriction, but it still creates problems of stability by interfering with the neutral zone, the lip closure path, phonetics, and esthetics. The upper incisal edges should contact the *inner* vermillion border of the lower lip during “f” sounds for best function and for the most natural smile.

If there is not contact of anterior teeth in CR, you can’t achieve *immediate* disclusion of posterior teeth during excursions. So the anterior teeth should ideally contact simultaneously, and with equal intensity with the posterior teeth when the jaw closes to maximum interocclusal contact in centric relation.
WHY THE ANTERIOR END POINT OF A SLIDE FROM CR WEARS MORE THAN THE SITE OF THE POSTERIOR INTERFERENCE

If a posterior tooth incline interferes with complete seating of the condyle-disk assemblies into CR, the protective sensory system around and within the interfering tooth activates the lateral pterygoid muscle to move the jaw around the interference (a slide). If there were no such protective mechanisms the interfering posterior tooth would get 100% of jaw closing force during every closure. The hit and slide is a trade-off that the anterior teeth at the end of the slide pay for because they are caught in a wedge. They adapt to the forced contact by moving out of the way, getting loose, or by being worn away. None of the options are as good as correcting the occlusion to equal intensity CR contact for both posterior and anterior teeth.

THE FORMULA FOR A PERFECTED OCCLUSION

A perfected occlusion has equal intensity, simultaneous contact of all teeth in centric relation. The moment the jaw moves forward, left, or right from CR, all the posterior teeth are immediately separated by the anterior guidance. This (posterior disclusion) is part of the magnificent design of the masticatory system that shuts off most of the elevator muscles as the lateral pterygoid muscles contract to move the jaw from CR. This posterior disclusion, in combination with a perfected anterior guidance; reduces muscle loading of the TMJs and reduces the potential horizontal forces on the anterior teeth. But it is also the absolute answer to solving occlusal wear because the posterior teeth cannot rub. Thus they cannot wear even if the patient bruxes. They can only touch contact in CR. Any and all jaw movement from CR separates all posterior contact. The simple formula for a perfect occlusion is therefore: lines in front, dots in back.

This formula becomes the goal of occlusal treatment, whether orthodontic, restorative, or equilibration. I have treated thousands of patients with this treatment goal and I’ve been able to observe them for many years of comfort and stability. It is completely predictable and is backed up with strong research in EMG, jaw tracking, and patient satisfaction.

The results prove the importance of understanding centric relation, and the rationale for perfecting the anterior guidance so it can immediately disclude all posterior teeth when the jaw moves from CR. It is also critically important to perfect the anterior guidance so it does not wear out. If properly contoured, we see little or no wear, even over many years, because there does not seem to be any tendency to rub on an anterior guidance that does not restrict jaw movement.

If you wish to develop a more useful understanding of why a complete knowledge of occlusal principles is so essential for predictable success in everyday dentistry, we’d be happy to hear from you. I think you’d find it to be a very exciting educational endeavor.

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