



THE SIGNIFICANCE OF OCCLUSION IN RESTORATIVE DENTISTRY

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ABSTRACT

In this time of fast-moving change in restorative techniques and products, all operative dentists should raise their consciousness of occlusal principles. Occlusal forces set limits on the selection of materials and often prescribe the design features needed for a successful outcome. With structurally or periodontally compromised teeth, the occlusal planning to minimize nonaxial forces lies at the heart of the restoration. Virtually all restorative dentistry is affected by the occlusal forces of the teeth in function. Clinicians who ignore them place their restorations in jeopardy and their peace of mind at risk.

All occlusal therapy relates ultimately to the hinge position of the mandible. By consensus, the optimum hinge position is centric relation, the most anterosu-perior position of the condyles in the glenoid fossae, articulating against the eminences, with the disks properly interposed. Also by consensus, the optimum occlusal scheme is mutual protection, in which the posterior teeth contact simultaneously and equally in centric occlusion, the canines disclude the posterior teeth in lateral excursions, and the anterior teeth disclude the posterior teeth in protrusion.

Whenever CR cannot be used as the starting point of occlusal treatment, or when sufficient canine support is lacking, the clinician may have to prescribe a treatment condylar position other than CR or modify the occlusal scheme. Mutual protection occlusion is the simplest to develop and CR is the simplest starting point. Departures from these ideals create added complexities for the dentist. The greater the number of excursive contacts in the occlusal scheme, the more involved the equilibration of those contacts. A treatment condylar position other than CR may not be repeatable when needed, and two studies suggest that it may change over time. Without a stable, repeatable foundation supporting it, the occlusion may be in jeopardy.

The removal of occlusal interferences, although not warranted as a routine prophylactic measure, is indicated under certain conditions. When beginning a significant amount of occlusal treatment, the clinicians may remove closing interference to achieve CR at the desired vertical dimension. They may remove excursive interferences that they do not want to perpetuate in

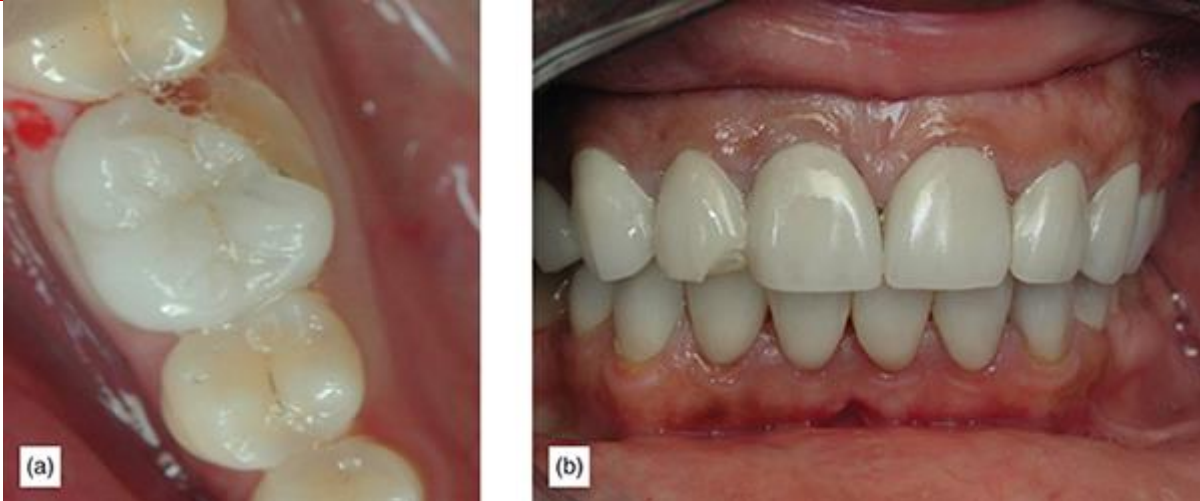
the new scheme. Selective removal may alleviate the signs of trauma from occlusion. There may be periodontal justification for axializing and equilibrating occlusal forces. Nonaxial forces on teeth with cervical erosion should be reduced as a means of limiting further erosion and protecting cervical restorations. When occlusal disharmony has been shown to reactivate a TMD, an equilibration or a more extensive rehabilitation may be necessary in the second phase of TMD treatment. In the symptomatic phase of a TMD, however, only reversible measures are appropriate.



The Occlusal Relationship to the Success of Restorative Dentistry

Ceramic restorations are at increased risk when the patient suffers from traumatic occlusion in combination with parafunctional activity (occlusal disease). In fact, durability studies indicate decreased durability of ceramic restorations in patients with parafunctional habits (Fig. 12.1a,b) [1]. The reality of the shorter lifespan of a ceramic restoration must be mitigated by the fact that all restorations and restored teeth, including metal-ceramic and gold crowns, will have a shorter lifespan and other problems when the patient has a significant traumatic injury, occlusion and parafunctional activity (Fig. 12.2a, b) [2].

Due to the fear of broken restorations, partial-covered ceramic restorations are contraindicated for many, suggesting the use of more aggressive procedures such as full crowns of any type, including full zirconia crowns [3,4,5,6]. Ultimately, parafunctional activity combined with traumatic occlusion (occlusal disease) is the cause of restorative failure [7], and good occlusal management can lead to success even in difficult cases (Fig. 12.3a-h).



Understanding the great importance of occlusion and occlusal management improves the quality of dentistry, and the health of patients because:

- It allows better differential diagnosis in complicated cases, because undiagnosed occlusal problems are responsible for many catastrophic treatment decisions and results.
- It encourages healthier dentistry, more supragingival minimally invasive dentistry, because the fear of fractured restorations forces the dentist to cut crowns, rather than using partial coverage.
- It permits better, more comprehensive treatment for patients. Fear of fractures or failure prevents the dentist from undertaking single-tooth dentistry and encourages them to shy away from more comprehensive cases.
- Ultimately, it provides a healthier dental life for patients with occlusal disease. Early diagnosis and minimally invasive management permits patients to have a more satisfying, healthier dental life.

Attention to occlusion goes beyond restorative success, as occlusion is one of the leading causes of tooth loss and is also one of the three main enemies of human dentition, alongside caries and periodontal disease [8]. An excellent example is shown in the comparative photographs in [Figures 12.6](#) and [12.7](#) of two patients, both in their early thirties, which show the devastating effect of occlusal disease. The patients are of similar age, both with good home care, free of caries and periodontal disease, but one has normal-looking dentition and the other has fractures, chips, abfractions and excessive incisal wear. There are similar examples in every practice. In this way, patients' dentition is compromised by occlusal disease, and it must be treated. Dentistry's goal is to help patients to keep their teeth for life, and occlusal disease can compromise this goal, inasmuch as caries and periodontal disease. Excessive incisal wear, fractures and other signs of occlusal disease are not an inevitable result of aging ([Figure 12.8](#)).



Occlusion: Untreated Enemy

Occlusion and the treatment of occlusal diseases are vital to dentistry. This is because everything the dentist does affects the patient's occlusion, and in turn, everything the dentist does affects the patient's occlusion (Fig. 12.9). Despite this, millions of patients with severe occlusive diseases remain untreated [9]. The main obstacle to the treatment of occlusal diseases is the patient's complete disinterest in occlusion and refusal to accept grinding, clenching or the

need to wear a night guard. The question arises: whose fault is it that patients are so ignorant of the very negative consequences of occlusal diseases? Yes, the dental community. The problem is that the patient is not explained that occlusal disease is not just wear and tear. However, there are other, deeper and more damaging signs and symptoms hidden beneath the visible wear and tear. Another major barrier to the implementation of occlusal diagnosis and treatment is the misconception that extensive rehabilitation is the best way to treat worn dentition. The idea that function follows form provokes complete rehabilitation. Occlusal treatment can and should be minimally invasive.



Diagnosis Using the Seven Signs and Symptoms of Occlusal Disease

Regardless of what we choose to call occlusal problems, it is paramount to have a simple, methodical and fast way of diagnosing occlusal problems. Traditionally, diagnosing occlusal problems has been via a mounted cast and extensive interviews. It is virtually impossible and impractical for most dental practices to mount a cast on each patient, and it has been an obstacle in the implementation of routine occlusal diagnosis. Diagnosis of occlusal disease should not be limited to patients with severely damaged teeth, nor should the ability to diagnose be limited to certain dentists. Early diagnosis can prevent many problems from occurring ([Figure 12.11](#)) or worsening, so it is vital that dentists have a simple way of quickly and efficiently implementing occlusal examination and diagnosis into their routine examinations.



Figure 12.11 Eighteen-year-old patient with occlusal disease.

The Occlusal Disease Management System [7,13] is incremental, based on severity, and incorporates patients' willingness to accept diagnosis and treatment. It allows even the busiest of dentists to incorporate occlusal diagnosis and therapy for every patient, as it only takes 3 minutes to do a simple occlusal diagnosis. Knowing the seven signs and symptoms of occlusal disease (Box 12.1) is part of the first stage, aiding in diagnosis [14]. Every patient in the practice must have an occlusal examination as part of a comprehensive examination, as well as at periodic examinations; this is Stage 1. Stage 2 is reserved for patients with moderate to severe signs and symptoms or those who wish esthetic rehabilitations or are in need of extensive restorative dentistry and are motivated to pay for a complete occlusal analysis with mounted casts (see Chapter 13). Stage 3 is when the patient is diagnosed with true joint disease or TMD, which usually means referral to a specialist or treatment if the clinician is trained to treat those cases.

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