



Occlusion and Periodontal Diseases

The implications of occlusal trauma should be part of a comprehensive periodontal examination.

City Tech

Isis Marsh,^a Rosalie Forrester,^b Allison Fody^c

^aDepartment of Dental Hygiene, New York City College of Technology

^bDepartment of Dental Hygiene, Farmingdale State University,

^cDepartment of Dental Hygiene, Farmingdale State University

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Abstract

Historically, the role of occlusal trauma in periodontal diseases has been a misunderstood and controversial topic in the dental field. A thorough knowledge of the current state of evidence on the connection between occlusion and periodontal diseases is essential for dental hygienists to offer appropriate and comprehensive periodontal therapy to patients exhibiting signs of traumatic occlusion. Occlusal discrepancies that may result in trauma are often missed during routine dental examinations. Dental hygienists who can accurately identify occlusal trauma may be better suited to provide referral guidance to patients as they generally have more consistent contact with patients. This review evaluates the research between the connection of occlusion and periodontal diseases and provides therapeutic recommendations based on evidential findings of occlusal trauma in patients diagnosed with periodontal diseases.¹

Methods

Marsh, Forrester, and Fody conducted a literature review with the following goal: To demonstrate that identifying occlusal trauma as part of a comprehensive periodontal evaluation could help improve patients' periodontal health. **Methods:** Information used in this synthesis was extrapolated from various peer-reviewed literature. A review of available reference literature discovered through ScienceDirect Journals: NYCCT Collection, Pubmed, and Google Scholar provided a foundation for understanding. Results from our survey of peer-reviewed literature provided the concepts discussed in this review.

Introduction/Background

According to the United States Centers for Disease Control and Prevention, nearly half of adults older than 30 have some form of periodontal disease. Diagnosis, treatment, and management of periodontal diseases are especially beneficial during their early stages when maintaining a healthy periodontium is achievable. Identifying occlusal trauma in the earlier stages of periodontitis is key to helping reduce the potential effects of inflammatory responses and excessive occlusal forces on the supporting bone around teeth. Oral health professionals, however, often overlook occlusal discrepancies that can lead to trauma as part of their overall periodontal assessment. It should become standard practice for clinicians to document and consider the implications of occlusal trauma as part of the comprehensive periodontal examination and incorporate routine occlusal evaluations.

A cause and effect relationship between occlusal trauma and periodontal diseases has yet to be established. Ethical considerations confine research to retrospective and empirical trials rather than the prospective and longitudinal studies necessary for determining occlusion and periodontal correlation. Present theories suggest that by injuring gingival and periodontal fibers and enhancing tissue permeability, occlusal trauma serves as an aggravating factor or modifier of periodontal diseases.

Periodontal pathogens are etiological causes for periodontal inflammatory responses. The potential risk for increased bone loss and pocket depth occurs when active periodontal infection and traumatic occlusion are present at the same time. Passanezi and Sant'Ana³ examined whether occlusal discrepancies played a role in the progression of periodontal diseases. They found that people with periodontitis and occlusal discrepancies who did not undergo occlusal therapy developed a significant and rapid increase in probing depths compared to those with periodontitis and occlusal discrepancies who underwent corrective occlusal treatment in conjunction with periodontal therapy. These results suggest that the assessment and documentation of occlusal discrepancies when performing a comprehensive periodontal examination are helpful.

Chairside Occlusal Evaluation Checklist

Anteroposterior (Sagittal)	Vertical & Perimeter	Transverse (Horizontal)	Signs of Trauma & Periodontal Disease
Angle Class I Angle Class II Angle Class III	Anterior Bite Open Normal Overbite (2-4mm) Deep Overbite (≥5mm) Posterior Open	Anterior Relativity of Midlines (Nose and Chin) ___ Max shift to right ___ Max shift to left ___ Mand shift to right ___ Mand shift to left	Clinical Signs Fremitus Tooth Mobility Tooth Migration Wear facets/chipping Neuromuscular TMJ tenderness
Normal Overjet (2-4mm) Increased Overjet (≥5mm) Negative Overjet/Underbite	Crowding Mild (0-3mm) Moderate (3-6mm) Severe (≥7mm) Spacing	Posterior Crossbite Missing teeth Ectopic teeth Anomalies	Radiographic Signs Widened PDL Vertical Bone Loss Root Resorption Furcation Involvement Thickened Lamina Dura
			Periodontal Disease ___ YES ___ Stage ___ Grade ___ NO



Occlusal interference over teeth # 19 against tooth #14.²



Clinical and radiographic aspects of localized periodontal disease in tooth # 19.²



Periodontal bone defect around tooth # 19.²

Occlusal trauma, like periodontal diseases, is multifactorial. Normal occlusion helps to prevent disease, and is not only esthetically appealing but also supports proper oral functions such as mastication, speech, and balance of periodontal structures. Malocclusion occurs when teeth do not come together in normal occlusion, and is considered any deviation from the anatomically acceptable relationship of the maxillary and mandibular arch/teeth. In a random sample analysis to determine the prevalence of malocclusion among US adults, Asiri et al⁴ concluded that of the 8,804 examined, nearly 66% had at least one or more forms of malocclusion.

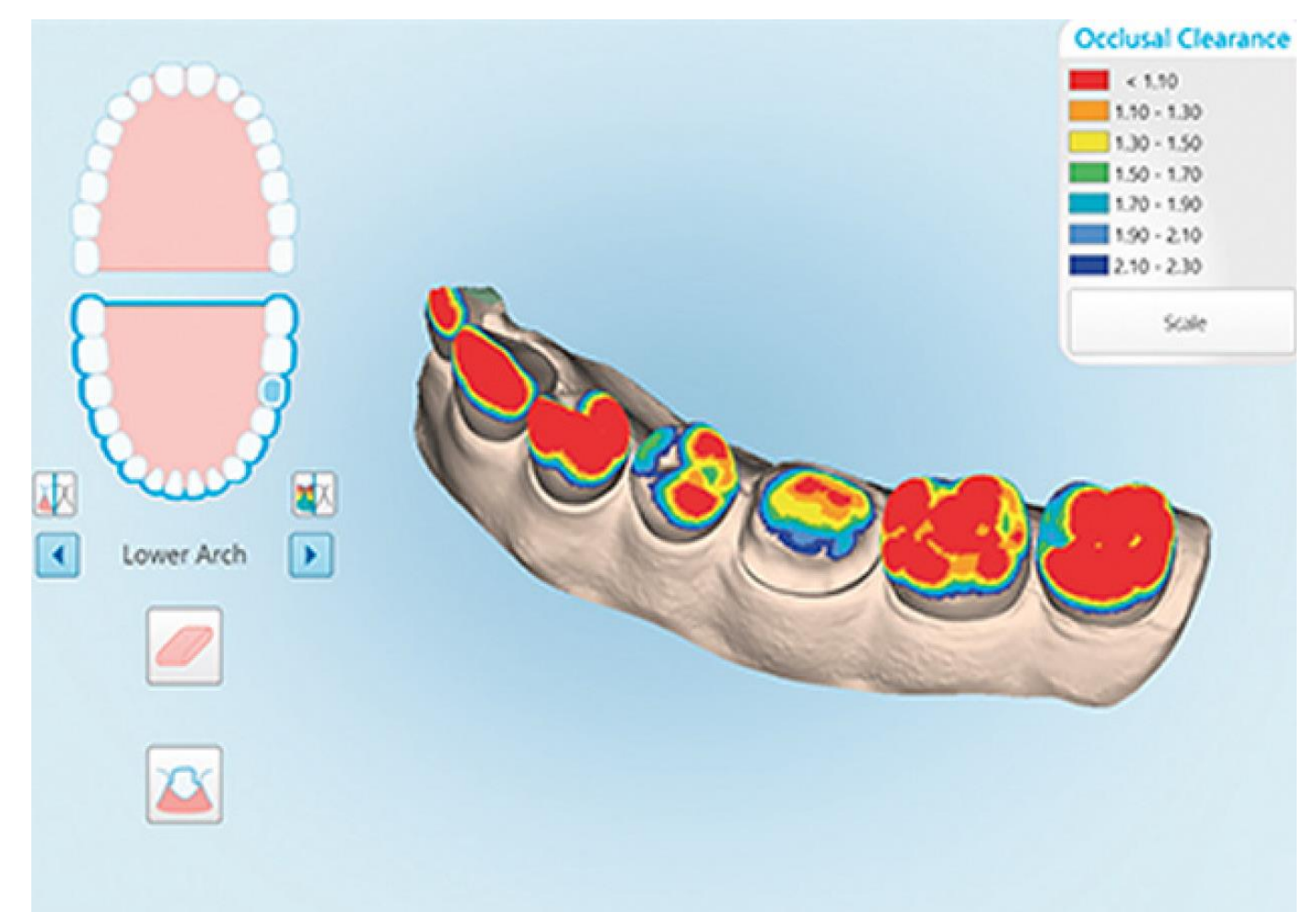
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Discussion: Therapeutic Approaches

Occlusal therapy may slow disease progression and improve the prognosis of periodontal diseases. Dental hygienists have the most consistent contact with patients and play a vital role in educating them on the various occlusal therapies for managing poor occlusal function and occlusal trauma. Occlusal equilibration, also known as occlusal adjustment, is the process of selectively grinding tooth structure to reduce traumatic forces at contact points and restore occlusal harmony. For certain occlusal discrepancies, occlusal adjustments are an effective treatment. When used in combination with adequate care, occlusal modification principles and treatment can yield beneficial results for the patient in a shorter time frame and at a lower cost than other occlusion correction treatments.

Dental hygienists can use emerging technologies, such as scanners, to assess and measure occlusal clearances, visualize the contact interaction between arches, locate abnormal occlusal stresses, and detect tooth wear or fractures.



Occlusal splints (e.g., occlusal guards, oral orthotics, and oral appliances) are removable dental appliances designed to reduce the harmful effects of traumatic forces from grinding, clenching, and other parafunctional habits. Occlusal splints can help manage fremitus and tooth mobility while improving periodontal regenerative outcomes and tooth retention. According to a longitudinal retrospective study, patients who didn't use occlusal splints and had increased tooth mobility or parafunctional habits exhibited a poorer prognosis and were twice as likely to lose their teeth than those who did. Orthodontic treatment is routinely recommended for occlusal correction but may not be accepted by the patient due to expense and long treatment time. Additional occlusal therapies include corrective, restorative dental work, orthognathic surgery, and myofunctional therapy.



Conclusion

Patients with periodontal diseases, as well as those at increased risk, will reap the greatest benefit from treatment aimed at reducing occlusal forces. Dental hygienists with more training or continuing education on identifying occlusal trauma may be better suited to provide guidance in such situations. If traumatic occlusal forces can exacerbate periodontal disease progression, then oral health professionals need to accurately assess occlusal discrepancies that could potentially compound the destructive nature of active periodontal diseases. Furthermore, while tooth mobility is one of the most common signs of occlusal trauma, it may result from periodontal inflammation alone. As such, proper diagnosis and treatment regarding the etiology of mobility can improve the prognosis of periodontal treatment.