

Chapter 20

Force Finishing in Dental Medicine: A Simplified Approach to Occlusal Harmony

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ABSTRACT

This chapter introduces the Force Finishing concept that is based upon the T-Scan technology. During case finishing, the aesthetic components are clinically visible and guided by the subjective analyses of the patient and the clinician. Alternatively, the case occlusal force components are invisible and do not become apparent until their adverse effects become chronic. When the force components are not properly addressed, clinicians may encounter Occlusal Force Disorder (OFD) symptomatology. Often, clinicians focus on the aesthetic finishing while placing a low priority on the occlusal Force Finishing by relying on subjective articulating paper mark interpretation and the patient's subjective "feel" with which to guide occlusal adjustments. Because articulating paper is a poor indicator of occlusal force and timing, the T-Scan technology can greatly improve the occlusal case finishing. This chapter details how to integrate the Force Finishing concept into conventional case finishing to simplify achieving occlusal force harmony in every case.

INTRODUCTION

It is now more than 100 years that both dentists and researchers have debated how to identify and define concepts of Dental Occlusion that could be practically applied in both diagnostic and therapeutic situations. Occlusion has been, and still to some extent, is a controversial discipline, as there are numerous questions related to occlusal

characteristics which have not yet been answered with scientific certainty. There are many diverse and polarized opinions regarding this subject that are seldom based on current scientific evidence, such as the etiology of Bruxism, the role of occlusion in Temporomandibular Disorders (TMD), Orthodontic treatment and its effects on TMD pain, and determining a correct mandibular position as a reference point for treatment.

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Clinicians around the world routinely perform various diagnostic and therapeutic procedures that involve Dental Occlusion (fillings, crowns, bridges, removable prosthesis, implant supported restorations, full mouth reconstruction, and orthodontics). However, there is a lack of scientific studies verifying the success of the different advocated concepts of occlusion used restoratively and during occlusal therapy. Nor are the methods to validate or the variable of an individual clinician's knowledge, clinical skills, and comfort zone with successfully treating occlusal problems. Generally, during the undergraduate education, dental students are not fully trained in Dental Occlusion. When these new graduates enter into clinical practice and begin accepting complex clinical cases to treat, many become confused with the differing theoretical recommendations and varied concepts about Dental Occlusion that are taught within academic and clinical Dental Medicine.

This chapter first discusses the many mandibular positional theories and the controversies surrounding each one, based upon their available clinical evidence. Next, the occlusal and other intraoral forces (applied stresses) are briefly discussed, that act on the Stomatognathic system during function and parafunction. Lastly, the chapter introduces the *Force Finishing* concept and its protocol to diagnose, prevent, and manage the occlusal force disorders in clinical practice.

Occlusion in Dental Medicine is a Mixture of Science and Art

The study of occlusion in Dental Medicine has two components; the science and the art. The science component of occlusion addresses how teeth fit together, and how the forces generated within the masticatory system affect the teeth and supportive structures. However, the subjective response of the patient to their occlusal "feel", and its customized management by clinicians is more of an art than a science.

Human beings are blessed with excellent adaptive capacity, hence, it is not surprising to observe that many patients adopt various occlusal schemes delivered by differing clinicians, that are based upon the clinician's knowledge, occlusal skill, and comfort rendering the occlusal treatment. Hence, in the clinical practice of occlusion, a clinician must follow some scientific basis, and use his or her artistic skills to respect the patient's ability to physiologically adapt.

A review of the literature regarding the history of Dental Occlusion suggests that occlusion can be divided into three physiologic stages (Dawson, 1989; Moffett, Johnson, & McCabe et al., 1964; Okeson, 1993; Ramfjord & Ash, 1983):

- **Normal Occlusion:** Commonly known as "physiologic" occlusion, which suggests that treatment is not required.
- **Pathologic Occlusion:** Also known as "non-physiologic", which suggests that treatment may be required.
- **Therapeutic Occlusion:** Often referred as to as an "ideal" or treatment occlusion.

Additionally, there are three treatment categories routinely employed in occlusal treatment:

- **Occlusal Maintenance:** In this category, a limited number of restorations are introduced to a physiologically acceptable original occlusal scheme.
- **Occlusal Modification:** In this category, only minor to moderate changes or improvement are made to the original occlusal scheme (minor occlusion adjustment, tooth movement, or opposing tooth restoration, or replacement), that is either physiologically acceptable, or non-physiologic and unacceptable.
- **Occlusal Re-Establishment:** In this category, major changes are required to improve a non-physiologic, unacceptable occlusal scheme. There is often a need to establish a

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