

Chapter 7

Employing the T-Scan/BioEMG III Synchronized Technologies to Diagnose and Treat Chronic Occluso-Muscle Disorder

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ABSTRACT

This chapter discusses chronic occluso-muscle disorder, which is a myogenous subset of temporomandibular disorder (TMD) symptoms resultant from occlusally activated muscle hyperactivity. It also describes the computer-guided occluso-muscle disorder treatment known as disclusion time reduction (DTR), that studies repeatedly show reduces many common muscular temporomandibular disorder symptoms. T-Scan-based research since 1991 has determined that a significant etiologic component of occluso-muscle disorder is prolonged (in time) occlusal surface friction shared between opposing posterior teeth during mandibular excursions, that occurs in both normal chewing function and during parafunction. This friction results in prolonged compressions of the periodontal ligament (PDL) fibers of the involved teeth, which when in excursive opposing occlusal contact, also experience pulpal flexure that leads to pulpal neural activation, which together with the periodontal ligament compressions, trigger excess muscle contractions within the masticatory muscles. It is this unique neuroanatomy that incites and perpetuates many chronic muscular TMD symptomatology, that can be readily resolved in patients that meet the diagnostic criteria for DTR candidacy, using the ICAGD coronoplasty that is performed in the maximum intercuspal position (MIP), without employing treatment splints, deprogrammers, appliances, orthotics, or mandibular repositioning. Additionally, this chapter will highlight the newest disclusion time reduction therapy (DTR) studies that support the clinical implementation of this highly effective measured occlusal treatment for occluso-muscle disorder.

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INTRODUCTION

Chronic Occluso-muscle Disorder (Dawson, 1989a) is a myogenous subset of Temporomandibular Disorder symptoms that afflicts the masticatory musculature with chronic pain, headaches and dysfunction. The associated muscle hyperactivity is a primary source of the frequently observed and highly similar group of symptoms that suffering patients commonly describe (Glickman, 1979a; Dawson, 1989a):

- Chronic facial pain, chronic temporal headaches, frequent clenching and grinding of the teeth, morning jaw pain, eye strain, earaches, chewing fatigue, chewing muscle and tooth pain, temperature sensitive teeth, and mild clicking and popping of the Temporomandibular Joints.

Muscle hyperactivity etiologies previously cited within the literature are Bruxism (Clayton, Kotowicz, & Zahler, 1971; Dawson, 1989b), clenching habits (Bertram, Rudisch, Bodner, & Emshoff, 2002), mal-occlusion (Mohlin, et. al., 2004), Trigeminal Neuralgia (Zakrzewska & McMillan, 2011), and occlusal interferences (Glickman, 1979b; Baba, Yugami, Yaka, & Ai, 2001).

Longstanding advocated treatments for chronic masticatory muscle hyperactivity have attempted to treat the symptomatology (Herman, Schiffman, Look, & Rindal, 2002) without addressing an underlying non-physiologic occlusal surface friction problem, that has been shown to be etiologic for the hyperactivity (Williamson and Lundquist 1983; Kerstein & Wight, 1991; Kerstein, 1995; Kerstein, Chapman, & Klein, 1997; Kerstein & Radke 2006; Kerstein & Radke, 2012). Despite the number of studies that have demonstrated an occlusal surface friction/masticatory muscle hyperactivity relationship to symptom appearance and frequency, an occlusal etiology as being causative for chronic Occluso-muscle Disorder symptoms, has not yet been widely accepted within the differing disciplines of Dental Medicine. In the traditional approaches to treating Occluso-muscle Disorder symptoms, the occlusion has been considered a limited component of the etiology, in favor of emotional and psychological factors, where it has been suggested that treatments be reversible and non-invasive to the teeth and oral structures.

Appliance therapy (Bertram, Rudisch, Bodner, & Emshoff, 2002) is the most frequently employed treatment. The main effects an intraoral appliance creates that can improve Occluso-muscle Disorder symptomatology are:

- The appliance interferes with the function of the teeth by limiting frequent tooth interdigitation and fictional occlusal surface excursive contact that occurs during parafunction and swallowing. This buffers the physiologic occlusal friction problem that is etiologic for the hyperactivity, by not letting teeth frictionally engage when the appliance is in place
- The appliance opens the vertical dimension, repositions the mandible in a chosen new anteroposterior and mediolateral position, and unloads the Temporomandibular Joint structures by moving the condyle vertically down and slightly out of the glenoid fossa.

Appliance therapy is often combined with muscle relaxant, pain, and anti-inflammatory medications, physical therapy to the jaw musculature (McNeely, Armijo, Olivo, & Magee, 2006), trans-cutaneous electronic nerve stimulation (TENS) (Alvarez-Arenal, Junquera, Fernandez, Gonzalez, & Olay, 2002), and soft food diets. All of these treatment approaches have been reported to be somewhat helpful to the chronic Occluso-muscle Disorder patient, and are considered viable, reversible Occluso-muscle Disorder treatments. Occlusal adjustment procedures, if employed at all in the conventional treatment

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