

Temporomandibular disorders (TMD) were defined as musculoskeletal pain or dysfunction in the masticatory system usually aggravated by chewing or jaw function, but independent of local disease involving the teeth, mouth, or other tissues (Clark, Seligman, Solberg & Pullinger, 1989). Typical symptoms reported by TMD patients include myalgia, reflected in limitations of mandibular movements, temporomandibular joint (TMJ) pain, crepitus disorders of mandibular mobility and arthritic problems (Dubner, Sessle & Storey, 1978; Yemm, 1979). A related problem is nocturnal bruxism, the forceful grinding or clenching of the teeth during sleep. The rhythmic chewing-like bruxing movements often result in audible gashing noises as well as prolonged periods of isometric contraction of the masticatory muscles (Fuchs, 1975). Abnormal wear to the teeth is the most often mentioned clinical sign of both acute and chronic bruxism (Nadler, 1966). Some of the periodontal damage documented in bruxism includes recession and inflammation of the gum (Moore, 1956) and resorption of the alveolar bone (Scandrett & Ervin, 1973). Damage to the TMJ (Glickman, 1972), hypertrophy of the masseter

Temporomandibular disorders (TMD) are presented as pathologies that must be conceptualized from both a dental/mechanical as well as a psychological perspective. Abnormal jaw muscle activity is seen as a potential outcome of psychological stress and as a physiological marker of possible emotional problems. The paper suggests a modular multimodal approach that involves the application of behavioral medicine symptom-focused principles first, and the use of a psychodynamic treatment parameter if underlying psychological conflicts are suspected of maintaining TMD symptomatology. The use of hypnosis in TMD is demonstrated with two cases. One responded well to a hypobehavioral treatment and the other required hypodynamic interventions. The importance of routine psychological evaluation and interdisciplinary collaboration for maximization of treatment efficacy with TMD patients is discussed.

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ter (Glaros & Rao, 1977) and a variety of facial pains and headache (Schwartz & Chayes, 1968) are some of the other known signs and symptoms related to bruxism. This disorder is associated with diurnal activity as well; dysfunctional diurnal habits include not only clenching or grinding of teeth, but also posturing habits, nail biting and lip or cheek biting. Rao and Glaros (1979) demonstrated that experimentally induced stress can result in masticatory hyperactivity. Jaw and facial muscle hyperactivity may also be associated with nonverbal communication. Katz and Rugh (1986) claimed that jaw clenching is a frequent expression of anger or fear in certain cultures. Epidemiological studies have indicated that although less than 10% of the adult population in Western industrialized societies are aware of these disorders, the prevalence of one or more of the aforementioned symptoms ranges from 28-86% (Solberg, 1983).

Rugh and Solberg (1976) proposed a multifactorial etiopathological theory for TMD to include functional (bruxism), structural (occlusion) and psychological (anxiety, tension) factors. While there seems to be agreement with regard to the influence of psychosocial factors in TMD, some etiological models disagree about the specific variables that are thought to be involved. It is widely agreed, however, that except for problems induced by external trauma or by degenerative arthritic conditions, stress is a common etiological variable influencing TMD (Solberg, 1986; McCreary, Glenn, Merril, Flack & Oakley, 1991; De Leeuw, Steenks, Ros, Bosman, Winnubst & Scholte, 1994). Several investigators found that bruxers tend to be (1) interpersonally and expressively aloof, (2) inhibited, (3) hard driving, (4) dissatisfied with their lives, and (5) apprehensively worried and guilt ridden (Lebrun & Lelonde, 1986; Cannistraci & Friedrich, 1987; Hicks & Chancellor, 1987; Fischer & O'Toole, 1993). The psychological approach to TMD regards the strain imposed by these patients on their temporomandibular area as a physiological response to emotional distress. This perhaps is similar to other chronic muscle pain disorders associated with increases in electromyogenic activity.

Assessment

While the literature on behavioral medicine is rich with symptom-alleviating interventions, this paper will propose a hypnotherapeutic perspective that considers a variety of treatment options depending on the specific causes assessed to be contributing to the temporomandibular problem in question. A comprehensive evaluation of the patient is warranted because while stress reactions can be responses to environmental, circumstantial or life-style factors, they can also mask more serious psychological disorders that may respond better to psychotherapy (or psychopharmacotherapy) than to symptom-focused behavioral medicine methods.

Behavioral medicine assessment

The basic principle of assessment in behavioral medicine is to redefine the symptoms in observable and measurable terms (Keeffe & Blumenthal, 1982). A patient with masti-

catory pain, for example, might be asked to help collect data that would enable the clinician to analyze muscle tension, the pain experience, and maladaptive jaw posturing, and then develop objective means for measuring them such as EMG activity or quantifiable pain reports. These measures are then utilized, usually in a self-monitoring fashion, in order to learn its function in the patient's life and how the pain is experienced. The patient and the therapist can later track the emerging symptom-fluctuation pattern and then discover those factors which influence the experienced pain level. Identified patterns of pain can help the clinician to develop hypotheses about the causality and maintenance of the presenting syndrome. It should be emphasized that this assessment phase would seem more valid when applied to TMD of muscular origin. Less is known about the psychological factors associated with arthrogenic disorders.

When pain is a significant component of the TMD, coping strategies for pain control need to be assessed as well. Melzack and Perry (1975) proposed a method whereby the patient is asked to establish a pain baseline for pinching. A new pain coping strategy is introduced in each successive trial of pinching. The patient is then asked to compare by means of a rating scale the baseline pain with the pain experienced after applying the coping strategy. Several discrete categories of pain-coping strategies have been suggested, among them avoidance or distraction, alleviation, alteration of the pain experience and awareness of the pain (Scott & Barber, 1977; Turk, Melchenbaum & Genest, 1983). The strategies that are experienced by the patient as most effective can then be chosen for the hypobehavioral intervention.

Hypodynamic assessment

Brown and Fromm (1987) proposed that in behavioral medicine the clinician should be alert for indications of major mental illness, substance or alcohol abuse, character pathology, posttraumatic stress syndromes, depression and so forth. They advised that the clinician should use the case history as a mean of developing a dynamic formulation of the primary conflicts and maladaptive patterns of relationships in the course of the patient's life. It is important to ascertain whether or not the TMD functions as part of a wider system's conflict. Chronic pain, for instance, may function to maintain equilibrium within a relationship, may represent masked hostility towards a therapist or may elicit repetitions of care-giving behaviors similar to those the patient had been exposed to in childhood. When TMD symptoms are related to psychodynamic or system conflicts, behavioral treatment may not be efficient. Case 2 presented later in this paper will illustrate hypodynamic principles applied to a TMD patient. Among other things, this case study will also demonstrate the use of hypnosis within the context of psychotherapy for the purpose of uncovering an underlying conflict that has manifested itself in temporomandibular symptomatology. In dynamic hypnotherapy, also called brief hypnoanalytically oriented psychotherapy (Brown & Fromm, 1987), the uncovering techniques represent an ongoing assessment process interwoven into the psychologically curative process. A thorough account of dynamic hypnotherapy

diagnostic techniques is beyond the scope of the paper. A brief outline of representative uncovering and hypnoprojective methods would be in line because they can produce information that reveals unconscious meaning and motivation.

Theater or Television Technique: In the Theater Technique (Wolberg, 1948) the patient is encouraged to project the unconscious meaning of the symptom into an imagined play's unfolding action. In the Television Technique, each channel can symbolically represent a different aspect of the patients' problem. This technique can also allow switching back to a relaxing program and other control options.

Cloud Technique: The patient is asked to imagine him/herself looking at the shifting images of clouds and to report his/her perceptions and the relationship between the imagined cloud designs and the problem he/she is working on.

Hypnotic Dreams: Ferenczi (1926) described hypnotic dreams as a convenient type of "forced fantasy" by which the clinician can directly inquire into unconscious processes in response to suggestions to dream in trance (De Benedetis, 1996; Sacerdote, 1978).

Automatic Writing: Mühl (1952) was one of the pioneers of this techniques. In it, the hypnotist introduces the idea that the hand can be the dissociated spokesman of the unconscious, without conscious awareness of either the act of writing or the ideas being expressed.

Revivification and Age Regression: In this method, the hypnotherapist structures the suggestions so as to explore experiences of different developmental ages sometimes by reliving the past experience in a compelling way in order to learn how these experiences have contributed to the current problem (Check & LeCron, 1968; Sheehan & McConkey, 1982).

Affect Bridge: In this method evoked strong affect associated with the problem is used as a bridge to a time earlier in the life of the patient when he/she felt exactly the same (Watkins, 1971).

Treatment

The hypnotherapeutic approach

Since stress has been identified as a basic contributor in the etiology of TMD, effective stress reduction techniques must be instituted for a lasting result. These methods must not only reduce myogenic tension and perceived pain, but need to address the problem of inattentive parafunctional habits that maintain TM symptomatology too. Several reports exist attesting to the clinical effectiveness of relaxation techniques in both chronic and acute TMD patients (Gessel & Alderman, 1971; Reading & Raw, 1976; Sam, McGrath & Brook, 1984). Some evidence exists that patients with TMD may have greater difficulty in relaxing the muscles of mastication than individuals who do not have this condition (Moller, Sheik-Ol-Eslam & Lous, 1971). One method clinicians have implemented in an effort to increase awareness to parafunctional habits and enhance relaxation capacities in TMD patients was biofeedback (Berry & Wilmot,

1977; Dohmann & Laskin, 1978; Gale, 1979; Kardachni & Clarke, 1977; Rugh & Johnson, 1981; Pierce & Gale, 1988). The research from this area indicates that both nocturnal binary biofeedback and diurnal analog feedback can be effective treatments for TMD. A major challenge in TMD remains the correction of maladjusted jaw activities. The jaw clenching- muscle cramping pain cycle can be reduced or eliminated by slightly opening the mouth. Inserting the tongue between the posterior teeth generally tends to act as an accurate measure of interocclusal distance, and serves as a reminder of unconscious mandibular closure. Suggesting to the patient that whenever he/she clenches his/her jaw he/she will automatically insert his/her tongue between his/her teeth averts the initialing stage in the muscular tension-pain cycle (Graham, 1974; Neiberger, 1971; Senter, 1971). When pain is involved, the patient is taught to utilize in trance the pain-coping strategies found to be most effective for him/her. Brown and Fromm (1987) recommend a gradual development of the patient's sense of self-efficacy and hope. As it is easier for people to affect pain distress than pain intensity it is thus recommended to address pain distress first. A stepwise approach is advisable in order to help with the often difficult transition from their successful performance when guided by the hypnotist to self-hypnosis. Initial self-hypnosis sessions are conducted in the office; first practices at home should be reported to the clinician in a prearranged phone call. An aid to self-hypnosis could be an audiotaped hypnotic session that could be prepared for home practice.

Illustrative case 1: A hypnotherapeutic intervention

History: This patient was a 21 year-old single undergraduate student. She was referred to me by her dentist because of severe bruxism and intense chronic headache. Complete head x-rays revealed no intracapsular TMJ damage but all her molars displayed abnormal wear. The patient indicated to her dentist that her college roommate had remarked that she audibly ground her teeth at night. The patient was also aware that she tended to clench her jaw during the day. Her dentist decided to refer her for psychological help after the patient disclosed she had been extremely tense because her boyfriend, an infantry officer, was on active duty on the volatile Lebanese border. The patient also reported she had started to suffer from examination stress and indicated that her bruxing behavior clearly increased in intensity during her term exam period and during the period from the moment she heard on the radio of border hostilities to the time she received a reassuring phone call from her boyfriend informing her that he was well.

She was the first-born daughter in a family of four persons. Her parents were described as warm and caring. She admitted them for their professional achievements and pursued her legal education in the hope of following in her father's footsteps as a successful criminal defense attorney. A mental status examination revealed no personality disorder. She met DSM-IV criteria for Adjustment Disorder with Anxiety and for Psychological Factors Affecting Medical Condition (stress affecting bruxism). Her MMPI-2 profile was a 17 revealing apprehensive brooding and concern for her health.

Treatment: The patient was provided with information about the psychological factors affecting bruxism and the rationale for a multicomponential stress-management treatment program. Her study habits were reviewed and tips were given for the enhancement of her learning efficiency. A hypnosis tape had been prepared for her to be used each time she sat down to study for her exams. Some of the suggestions on the tape were: "When you open your eyes, you will be able to concentrate on your studies. You will be able to concentrate to such a degree that you will absorb the material like a sponge taking up water, making an indelible mark in your mind, so you will be able to recall the material very easily during the exam. You will indeed find out that the moment you enter the examination room and pick up your paper you will become completely calm and relaxed and the learned material will become readily available for each question."

The patient had been taught autorelaxation and was encouraged to practice the skill on a daily basis. Several sessions were dedicated to the corrections of her bruxing behavior. Following the behavioral rehearsals at the clinic these post-hypnotic suggestions (partially adopted from Golan, 1989) were given: "You have now acquired some very helpful skills for the management of your stress. Whenever you find yourself in one of those tension producing situations, such as waiting for your boyfriend's phone-call or a difficult examination, you will notice that your jaws tend to clench. However, it will no longer be necessary to tighten your cheek muscles or grind your teeth. You will find yourself pressing your right index finger to your thumb instead, exactly as you practiced in the clinic, and no longer use your teeth. Any time your teeth accidentally touch when you are not eating, your lower jaw will immediately drop. Even when your lips are shut your teeth will stay slightly apart. Your tongue will remember to verify the accurate distance between your jaws by periodically inserting itself between your posterior teeth. This will help your muscles to become loose, soft, relaxed ... This will prevent your muscles from cramping and will enable you to enjoy a sense of comfort and well-being. At night you will be able to continue your relaxation into sleep. Throughout your sleep your teeth will stay apart. Any time your jaws press against each other you will awake, your lower jaw will drop, and you will immediately fall sound asleep realizing that your subconscious mind is protecting you."

The patient responded well to suggestions for pain alleviation. She was given suggestions to apply in trance an imagined analgesic ointment that would create numbness. This technique was recommended to be used only as an adjunct intervention. The patient was seen for ten weekly sessions before she reported she felt symptom-free. She was still well and had maintained her gains at a follow-up visit five weeks later.

Illustrative case 2: A hypnotherapeutic intervention

History: This patient (B) was a 69-year-old man who was also diagnosed as suffering from bruxism with both diurnal and nocturnal activity with no known anatomical causes. Grinding, clenching and biting damage was identified on his teeth and on internal

soft tissues. He suggested severe facial pain radiating from his temporomandibular joints, at times causing total incapacitation that required complete bed rest. Although no intracapsular TMJ pathology was found, severe mandibular hypomobility affected his speech and caused significant difficulties in eating. Continued intense nocturnal masseter hyperactivity created serious damage to a series of prescribed dental splints, which had to be periodically replaced. After 4 years of intensive craniomandibular care with minimal improvement this patient was referred to me for psychological consultation.

B, a professor emeritus of mathematics, retired from the university at age 65 and dedicated most of his time to scientific writing. Intense headaches and facial pain interfered with his academic endeavors and contributed to the development of significant psychological distress. During the 3 years preceding his therapy with me he had developed onset insomnia and reported low energy and poor concentration, which added to his scholastic difficulties. By the time I saw him he was suffering from low self-esteem and was skeptical about ever recovering from his torment. This patient met DSM-IV criteria for Dysdymic Disorder. His MMPI-2 scores were 21 "70" reflecting considerable depression, social introversion and intense pessimistic worrying concerning his health.

Born in Budapest, B was an only child. His father, a physician, and his mother, a theater actress, were both murdered during the Holocaust. He managed to evade transportation to the death camps and hid, undetected, in the basement of a bombed-out restaurant until the end of the war, feeding mostly on a large supply of dry beans he had found. In 1948 he emigrated to Israel, where he was immediately mobilized into the newly formed Israel Defense Forces. He participated in several bloody battles, and saw many of his comrades fall. In 1949 he commenced his university studies, during that year he met his future wife, a Holocaust survivor herself, and married her. The patient dedicated his life to scholarship in mathematics, leading a stable but emotionally detached marital life. He reported having been both physically and emotionally healthy until his retirement.

Treatment: The clear temporal relationship between the onset of B's craniomandibular and emotional distress and his retirement intrigued him. However, he was unable to find any conceivable connection between the events. Although the patient seemed fairly interested in a psychotherapeutic exploration of this issue, he indicated he was too consumed by his physical discomfort to apportion any attention resources to traditional "talk therapy". The patient agreed to a psychiatric consultation and was prescribed 20 mg Fluoxetine, one capsule daily, to which he responded well. After three weeks he regained his former level of energy, his mood improved and he seemed more optimistic about his chances of recovery. The first four sessions with me were dedicated to the implementation of a few hypnotic pain reduction techniques, similar to those described by Crasilek (1995). The chronicity of pain of this still motivated but low-spirited, patient encouraged me to strive for speedy symptom alleviation. The adopted approach involved training in rapid successive trials of several diversified methods of hypnotic inductions used consecutively within one psychotherapeutic session. The pro-

cedure involved (1) covert hypnotic muscle relaxation, (2) displacement of the temporomandibular pain to the right thumb, (3) glove anaesthesia, (4) transference of the glove anaesthesia to sensitive facial areas. A special hypnotic session was tape-recorded in order to facilitate daily practice. On this tape specific post-hypnotic suggestions were given for optimal interocclusal distance. In the fifth and sixth sessions the patient was taught self-hypnosis, and its efficacy in the management of pain was demonstrated. The patient subsequently reported a noticeable improvement in his pain experience but bruxism and considerable TMJ discomfort persisted. Ensuing sessions adopted a more traditional psychotherapeutic format. In one of them B reported a dream in which he was on trial in military court for treason. The procedure took place amid a smoldering battlefield scattered with bodies and burning vehicles. The dream ended as he was found guilty and summarily prepared for execution by a Nazi SS firing squad. The patient had no insight into the dream but felt it was very significant. I decided to explore this lead further because the dream seemed to have tapped a few themes associated with his troubled past during the 1940s. French and Fromm (1986) demonstrated that dreams are reactions to, and expressions of, a current conflict. The past, they claimed, if present in the dream is usually reactivated in the here-and-now situation. Elsewhere, Fromm and French (1974) posited that every dream contains one or more successful or unsuccessful attempts to solve the conflict. What B's current conflict was, and how it was related to the themes in the dream and to his temporomandibular symptomatology, were the psychological questions I felt needed to be resolved.

Hypnodynamic techniques can help facilitate and improve working with dreams. These techniques are of choice, particularly in the behavioral medicine context, where a burning physical problem is central in the patients' motivation for psychological help. In an attempt to resolve the encoded messages in B's dream, he was hypnotized and asked to re-dream his dream (Sacredote, 1978). Encouragement was given to the patient's subconscious mind to utilize a different manifest content. I also suggested that B would be better able to understand the symbolism of both the original and subsequent dreams. In his hypnotically induced dream B reported driving his car. He was considerably younger and his wife and children were riding along with him. Suddenly, he realized that he had to jump out of the car because it was going to crash. He woke up terrified and whispered: "I killed them." The ensuing sessions focused on two sets of tragic and guilt-ridden memories that were emerging. Both involved a powerful survivor guilt: one associated with the demise of his own family in the death camps and the other related to his fallen comrades in Israel's War of Independence. Sessions 8-12 were dedicated to the processing of his guilt. The patient admitted that guilt was also troubling him currently and stated that he could not justify such a "useless existence" as he had been leading since his retirement. Psychotherapy proceeded for three more months until it was mutually terminated. However, from the 12th session B reported a complete resolution of his temporomandibular symptomatology. At a 6-month follow-up B was still feeling well and reported enjoying a generally stable and balanced mood.

Discussion

Hypnosis itself is not a therapy but an adjunct to some form of medical treatment or psychotherapy. This paper demonstrated applications of hypnosis in behavioral medicine as an adjunct to behavioral (case 1) and short-term psychodynamic (case 2) therapies. Temporomandibular disorders cannot be conceptualized solely as a generalized or an environmentally specific stress, nor can such problems be approached with treatments derived from an etiological perspective that is primarily dental and mechanical (Somer, 1991). Although both nocturnal biofeedback and maxillary occlusal EMG splint therapies have been demonstrated to decrease severity of bruxism, controlled clinical reports generally indicate a lack of long-term treatment effect and serious relapses soon after treatment (Pierce & Gale, 1988; Rugh & Solberg, 1975). The cases presented here and elsewhere (Somer, 1991) underscore the role of psychological factors in TMD and the importance of a routine psychological evaluation of every TMD patient. Patients approaching craniomandibular experts for help can reasonably be expected to suffer from considerable physical discomfort. They can also be expected to be somatizers, that is, persons who tend to become physically symptomatic under psychological stress. These two factors call for psychological interventions that are quick acting and effective. For this reason, hypnosis can often be considered an adjunct treatment of choice. The clinician, however, must design a treatment plan that matches the particular needs of the patient. Highly hypnotizable patients who hold their dentist in very high esteem might respond dramatically to direct suggestions for symptom relief. The majority of patients, however, would need some enhancement of their stress management skills, specifically tailored to their individual life circumstances. Case 1 is an illustration of a systematic short-term protocol of hypnobehavioral methods that produced long-lasting improvement in TMD symptomatology. Brown and Fromm (1987) recommended that all initial hypnotherapeutic sessions in behavioral medicine should routinely entail direct suggestions and posthypnotic suggestions for symptom relief. They believe that up to 20% of patients (the high-hypnotizable) will respond favorably and will not need further intervention. For those who do not respond they recommend an individually tailored protocol of hypnobehavioral treatment. Case 2 is an example of a type of patient whose deep-seated psychological problems prevented a thorough recovery even after he received both psychopharmacological and hypnobehavioral intervention. Commenting on dental bruxism almost a quarter of a century ago, Nadler (1973) insisted that although behavioral interventions are often an essential component of successful treatment of bruxism, patients' stress sometimes is fuelled by underlying emotional problems. Such patients fail to fully respond to straightforward hypnobehavioral methods and reach, exactly like B, a treatment plateau. Patients such as B require an approach that will help them uncover unconscious conflicts associated with the symptoms. When the patient's symptoms are suspected to be maintained by a pathological interpersonal system, family therapy might be indicated. When the patient's symptomatology further persists Ericksonian hypnotherapy aimed at alte-

ring habitual frames of reference, beliefs and illness behaviors, might be the alternative treatment of choice.

This paper described relatively advanced hypnotherapeutic interventions with TMD patients. The boundary between a multimodal dental medicine intervention and a highly specialized psychotherapeutic treatment becomes blurred. Craniomandibular experts should be able to identify their own strengths and limitations as far as clinical hypnosis is concerned. Clearly some of the psychotherapeutic interventions suggested in this paper require extensive prior training and even licensure in psychotherapy. It is my opinion that since TMD is psychosomatic in nature (that is to say that it involves both physiological as well as psychological etiologies), all TMD patients should routinely undergo psychological screening in order to determine how the psychologist and the dentist may work cooperatively to produce maximally effective treatments.

References

Berry, D.C., & Wilmot, G. (1977). The use of biofeedback technique in the treatment of mandibular dysfunction pain: A preliminary report on the Myotron 220. *Journal of Oral Rehabilitation*, 4, 255-260.

Brown, D.P., & Fromm, E. (1987). Hypnosis and behavioral medicine. Hillsdale, NJ: Lawrence Erlbaum.

Cannistraci, A., & Friedrich, J.A. (1987). A multidimensional approach to bruxism and TMD. *New York State Dental Journal*, 53(8), 31-34.

Cheek, D.B., & LeCron, L.M. (1968). *Clinical hypnotherapy*. New York: Grune & Stratton.

Clark, G.T., Seligman, D.A., Solberg, W.K., & Pullinger, A.G. (1989). Guidelines for the examination and diagnosis of temporomandibular disorders. *Journal of Craniomandibular Disorders - Facial Oral Pain*, 3(1), 7-14.

Crastineck, H.B. (1995). The use of the Crastineck Bombardment Technique in problems of intractable organic pain. *American Journal of Clinical Hypnosis*, 37(4), 255-266.

De Benedictis, G. (1996). The healing dream. The therapeutic use of dreams in hypnosis. In B. Peter, B. Trenkle, C. Kinzel, C. Duffner, & A. Iost-Peter (Eds.), *Munich Lectures on Hypnosis and Psychotherapy* (pp.69-78). Hypnosis International Monographs 2. Munich: M.E.G.-Stiftung.

De Leeuw, J.R.J., Steenks, M.H., Ros, W.J.G., Bosman, F., Winnubst, J.A.M., & Scholte, A.M. (1994). Psychosocial aspects of craniomandibular dysfunction. An assessment of clinical and community findings. *Journal of Oral Rehabilitation*, 21, 127-143.

Dohmann, R.J., & Laskin, D.M. (1978). An evaluation of electromyographic biofeedback in the treatment of myofascial pain-dysfunction syndrome. *Journal of the American Dental Association*, 96, 656-662.

Dubner, R., Sessle, B.J., & Storey, A.T. (1978). The neural basis of oral and facial function. New York: Plenum.

Fereneci, S. (1926). On forced fantasies. In *Further contributions to the theory and technique of psychoanalysis* (pp. 68-77). London: Hogarth Press.

Fischer, W.F., & O'Toole, E.T. (1993). Personality characteristics of chronic bruxers. *Behavioral Medicine*, 19(2), 82-86.

French, T.M., & Fromm, E. (1986). *Dream interpretation: A new approach*. Classics in Psychoanalysis: Monograph Series No. 5. New York: International Universities Press.

Fromm, E., & French, T.M. (1974). Formation and evaluation of hypotheses in dream interpretation. In R.E. Woods, & H.B. Greenhouse (Eds.), *The new world of dreams* (pp. 271-283). New York: Macmillan.

Fuchs, P. (1975). The muscular activity of the chewing apparatus during sleep. *Journal of Oral*

Rehabilitation, 2(1), 35-48.

Hicks, R.A., & Chancellor, C. (1987). Nocturnal bruxism and Type A behavior in college students. *Psychological Reports*, 60(10), 1211-1214.

Gale, E.N. (1979). Biofeedback for TMJ pain. In B.D. Ingehoff & W.D. McCutcheon (Eds.), *Clinical research in behavioral dentistry* (pp. 83-93). Morgantown, WV: West Virginia University.

Gessel, A.H., & Alderman, M.M. (1971). Management of myofascial pain dysfunction syndrome of the temporomandibular joint by tension control training. *Psychomatics*, 12, 302-309.

Glaros, A.G., & Rao, S.M. (1977). Bruxism: A critical review. *Psychological Bulletin*, 84(4), 767-781.

Glickman, I. (1972). *Clinical periodontology* (4th edition). Philadelphia: Saunders.

Golan, H.P. (1989). Temporomandibular joint disease treated with hypnosis. *American Journal of Clinical Hypnosis*, 31(4), 269-274.

Graham, G. (1974). Hypnoanalysis in dental practice. *American Journal of Clinical Hypnosis*, 16, 178-187.

Kardachi, B.J., & Clarke, N.G. (1977). The use of biofeedback to control bruxism. *Journal of Periodontology*, 48, 639-642.

Katz, J.O., & Rugh, J.D. (1986). Psychophysiological aspects of oral disorders. *Annals of Behavioral Medicine*, 8(4), 3-9.

Keefe, F.J., & Blumenthal, J.A. (1982). Assessment strategies in behavioral medicine. New York: Grune & Stratton.

Lebrun, M., & Lelonde, P. (1986). Le bruxisme, "symptome levan" d'un problem bio-psychosocial. *Union Medicale Canadien*. June, 421-424.

McCreary, C.P., Glenn, C.P., Merrill, R.L., Flack, V., & Oakley, M.E. (1991). Psychosocial distress and diagnostic subgroups of temporomandibular disorder patients. *Pain*, 44(1), 29.

Meizack, R., & Perry, C. (1973). Self-regulation of pain: The use of alpha-feedback and hypnotic training for the control of chronic pain. *Experimental Neurology*, 46, 452-469.

Moller, E., Sheik-Of-Eslam, A., & Lous, I. (1971). Deliberate relaxation of the temporal and masseter muscles in subjects with functional disorders of the chewing apparatus. *Scandinavian Journal of Dental Research*, 79, 478-482.

Moore, D.S. (1956). Bruxism, diagnosis and treatment. *Journal of the Canadian Dental Association*, 22(3), 583-590.

Mühls, A. (1952). Automatic writing and hypnosis. In L.M. LeCron (Ed.), *Experimental hypnosis* (pp. 426-438). New York: Macmillan.

Nadler, S.C. (1966). The effects of bruxism. *Journal of Periodontology*, 37(3), 311-318.

Nadler, S.C. (1973). Factors about dental bruxism. *New York Journal of Dentistry*, 43, 153-154.

Neiburger, E.J. (1971). A syllabus on hypnosis and a handbook of therapeutic suggestion (p. 118). Chicago: American Society of Clinical Hypnosis Education and Research Foundation.

Pierce, C.J., & Gale, E.N. (1988). A comparison of different treatments for nocturnal bruxism. *Journal of Dental Research*, 67(3), 597-601.

Rao, S.M., & Glaros, A. G. (1979). Electromyographic correlates of experimentally induced stress in diurnal bruxists and normals. *Journal of Dental Research*, 58(9), 1872-1878.

Reading, A., & Raw, M. (1976). The treatment of mandibular dysfunction pain. *British Dental Journal*, 140, 201-205.

Rugh, J.D., & Solberg, W.K. (1975). Electromyographic studies of bruxist behavior before and during treatment. *Journal of the California Dental Association*, 3, 56-59.

Rugh, J.D., & Solberg, W.K. (1976). Psychological implications in temporomandibular pain and dysfunction. *Oral Sciences Reviews*, 1(1), 3-30.

Rugh, J.D., & Johnson, R.W. (1981). Temporal analysis of nocturnal bruxism during EMG feedback. *Journal of Periodontology*, 52, 263-265.

Sacredote, P. (1978). Induced dreams: About the theory and therapeutic applications of dreams hypnotically induced. Brooklyn, NY: Theo Gaus.

Scandrett, F.R., & Ervin, T.H. (1973). Occlusion and preventive dentistry. *Journal of the Ameri-*

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 can Dental Association, 87(4), 1231-1233.
- Schwartz, L., & Chaves, C.M. (1968). Facial pain and mandibular dysfunction. Philadelphia: Saunders.
- Scott, D.S., & Barber, T.X. (1977). Cognitive control of pain: Effects of multiple cognitive strategies. *Psychological Record*, 2, 373-383.
- Secer, I.L. (1971). A syllabus on hypnosis and a handbook of therapeutic suggestions. Chicago: American Society of Clinical Hypnosis Education and Research Foundation.
- Sheehan, P.W., & McConkey, K.M. (1982). Hypnosis and experience: The exploration of phenomena and process. Hillsdale, NJ: Lawrence Erlbaum.
- Somer, E. (1991). Hypnotherapy in the treatment of the chronic nocturnal use of a dental splint prescribed for bruxism. *The International Journal of Clinical and Experimental Hypnosis*, 39, 145-154.
- Solberg, W.K. (1983). Epidemiology, incidence and prevalence of temporomandibular disorders: A review. In D.M. Laskin, W. Greenfield, F.N. Fale, et al. (Eds.), *The president's conference on the examinations, diagnosis and management of temporomandibular disorders* (pp. 30-39). Chicago: American Dental Association.
- Solberg, D.K. (1986). Temporomandibular disorders: background and the clinical problems. *British Dental Journal*, 160(2), 157.
- Stam, H.J., McGrath, P.A., & Brooke, R.L. (1984). The treatment of temporomandibular joint syndrome through control of anxiety. *Journal of Behavior Therapy and Experimental Psychology*, 15, 41-45.
- Turk, D.C., Meibenhauim, D., & Genest, M. (1983). Pain and behavioral medicine: A cognitive behavioral perspective. New York: Guilford.
- Wolberg, L.R. (1948). *Medical hypnosis*. Vols. I & II. New York: Grune & Stratton.
- Watkins, J.G. (1971). The affect bridge: A hypnanalytic technique. *International Journal of Clinical and Experimental Hypnosis*, 19, 21-27.
- Yemm, R. (1979). Neurophysiologic studies of temporomandibular joint dysfunction. In G.A. Zarb, & G.F. Carlsson, (Eds.), *Temporomandibular joint: function and dysfunction*. Copenhagen: Munksgaard.

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