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CONSERVATIVE AND SUCCESSFUL TREATMENT OF TEMPOROMANDIBULAR DYSFUNCTION IN A PRIVATE RURAL PRACTICE

Robert O. Uppgaard, D.D.S.

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Address for reprint requests: Robert O. Uppgaard, D.D.S. 524 Kingwood Brainerd, MN 56401

ABSTRACT: This clinical study of 382 patients with temporomandibular dysfunction (TMD) details how successful treatment can be achieved in a rural area without the support and services of specialized TMD clinics. Successful treatment is within the scope of the general dentist, provided the practitioner understands the patient's total problem and treatment options. The study spanned a 10-year period, including follow-up at one, five, and eight-year intervals.

Dr. Robert O. Uppgaard *received his D.D.S. degree from the University of Minnesota in 1953. He spent the next six years as a part-time instructor there as he pursued two years of postgraduate study in oral pathology. He continued his education through postgraduate C.E. courses, as well as many TMJ orthodontic/orthopedic three-day workshops. He returned to the staff (1978-1980) as a part-time assistant professor, serving in a trouble-shooting capacity for TMD patients. He is a member of Omicron Kappa Upsilon and a fellow of the Academy of General Dentistry. His practice is limited to TMJ and craniofacial pain and myofascial pain of the head and neck.*

The general dentist is in a unique position to identify, diagnose, and treat patients experiencing what is commonly identified as temporomandibular dysfunction (TMD). Often the dentist or physician is the first to see patients with symptoms of TMD. Most patients can be managed by general dentists if the dentist understands the patient's problem and has the willingness to work with the patient if the treatment is available. This is especially important in rural areas where the services of specialized TMD clinics are not available.

The following report is a 10-year study of 382 patients who were treated for TMD. This is a clinical study; a control group was not used.

Records were kept on the patients' chief complaints, additional symptoms, range of motion, stress evaluation,[1,2] contributing factors[3–8] (**Table 1**), previous treatment, diagnoses, types of appliances used (if any), age, evaluation of specific trigger points,[9–12] follow-up, and/or referral. A telephone follow-up was attempted on all patients at one, five, and eight-year intervals.

The value of such research is in expanding the focus from strictly traditional dental consideration. The research allowed the author to use the expertise of many practitioners both inside and outside the dental community without prejudice.[7,8,13–19]

The basic considerations in evaluating the results were whether the patient was helped and how the patient felt one to eight years later. If the patient was helped, what treatment modalities were effective in attaining a solution to the patient's problem?

Results of Patient Follow-Up

Of the 382 patients treated, none needed to be referred for temporomandibular joint (TMJ) surgery. Eighty-six percent of the patients treated for TMD had additional

Table 1
Contributing Factors

Behavioral	Clenching
	Nail biting
	Gum chewing
	Sleep habits
	Excessive caffeine or alcohol
	Postural habits (phone habits)
	Low exercise level
Social	Disability
	Litigation
	Secondary gain
	Financial problems
	History of physical/sexual abuse
Cognitive	Thoughts and attitudes that are counter-productive to successful management, i.e., general confusion/senility
	Low motivation
	Poor compliance
	A long list of receiving differing opinions
	Lack of confidence in doctors
Emotional	Depression
	Apathy
	Frustration
	Anger
	Anxiety
	Hate
	Nervousness
Biologic	Skeletal discrepancies, i.e., posture
	Occlusal discrepancies
	Loss of posterior teeth
	Nutritional inadequacies
	Forward head posture
Environmental	Weather
	Air and water pollutants
	Allergies
	Food additives
	Vibrations
	Chronic sounds
	Improper lighting

cervical and shoulder muscle involvement. Clearly, successful treatment would have been highly unlikely without the dentist's understanding of the relationship of the total body to the TMJ, as well as the roles of posture, referred pain, faulty work habits, muscle overloading, and previous injuries.

Eighty-five percent of the patients completed treatment, 6% were referred to physicians for medical consideration,[16] 4% were referred to other TMJ clinics or offices, 3% did not follow through with the recommended treatment plan, and 2% were diagnosed as not having TMJ-related problems.

Of the total number of patients, 51% were reached by phone, with the follow-up time varying from one to eight years. A special effort was made to follow up six patients who had been scheduled for surgery, as well as other equally challenging cases. There was absolutely no evidence of deterioration throughout that time. With short-term follow-up, 34% of the patients completed treatment, but had moved or could not be reached for long-term follow-up.

For 32 of the TMD patients, whiplash was the precipitating factor.

The breakdown by age of these TMD patients is as follows: 10 to 19 years old, 12%; 20 to 29 years old, 19.5%; 30 to 39 years old, 35%; 40 to 49 years old, 19.5%; 50 to 59 years old, 6%; 60 years and older, 8%. Of the total number of patients, 79% were female; 21% were male.

Defining Conservative Treatment

Conservative treatment of TMD hinges on successful diagnosis and management of patients while avoiding surgery. Conservative treatment requires understanding the total patient, not just the TMJ. This involves evaluating posture, referred pain, oral habits, and the muscles of the body as they relate to the TMJ. Compensatory adaptive tooth positions that occurred while the disk was displaced must be undone. Posterior open bites must be corrected so teeth occlude without a splint, in harmony with the newly reduced joint.[20]

Stress is usually a factor. However, stress does not cause pain or TMJ problems directly.[2] Behavioral habits that put continual strain on the muscles or joints, however, can result in enough repeated trauma to cause muscle (and sometimes joint) pain. It should be noted that recurring pain is usually due to another stressful event or regression to faulty habits.

Conservative treatment seeks to develop the patients' awareness of their problems, so that they can participate in the treatment plan and take charge of their program for lifelong success.

Guidelines for Management of TMD Patients

Note the sequence of appointments and procedures.

I. Telephone Contact

The receptionist should obtain the name, address (home and office), phone numbers, name of the referring doctor, and the nature of the problem (written in the exact words of the patient, including any pertinent comments). If symptoms are severe, the patient is given an appointment immediately. When possible, a comprehensive medical/dental history questionnaire is sent in advance of the first appointment.

Table 2

Symptoms Most Frequently Reported Are the Following:	
Clenching _____	Numbness in fingers _____
Difficulty opening _____	Dizziness _____
Difficulty closing _____	Fatigue _____
Jaw locks open _____	Nervousness _____
Jaw locks shut _____	Depression _____
Swallowing problems _____	Headaches _____
Muscle spasms _____	Sinus problems _____
Muscle soreness _____	Backaches _____
Arthritis _____	Difficulty sleeping _____
Ringing in ears _____	Cold hands/feet _____
Hearing difficulty _____	Tearing eyes for no reason _____
Frequent earaches _____	Pressure behind eyes _____

II. Comprehensive Consultation Appointment

At least 30 minutes are used for discussion of the questionnaire, going over each question carefully, emphasizing the chief complaint, taking notes, and observing and listening to the patient.[11] It is essential that this be done before any clinical examination or x-rays are taken, as the patients sometimes do not understand the questions or may give additional clues spontaneously. **Table 2** shows the symptoms most frequently reported.[4,21]

The clinical examination should include all of the following: (1) Identification of all trigger points that may be referring pain to the TMJ or to other areas of the head by palpation of head/neck/shoulder muscles;[5,22-24] (2) Oral examination—the condition of tissues, missing teeth, occlusal characteristics, first contact, range of motion measurements, deflection as well as deviation patterns, stethoscopic sounds (opening and closing clicks of crepitus), and passive and resistive muscle testing.

All pain (head to toe) should be charted on body forms (**Figure 1**)[20,25] on the medical/dental questionnaire. A tentative diagnosis and treatment plan can then be established. Specific exercises[26-28] and behavioral modification are usually prescribed at this stage and supportive referrals are made, as necessary.

Patient Awareness Component. Successful treatment depends on the patient's understanding of their problem and the role the patients must play in attaining wellness by participating in the treatment plan. This can be accomplished by visual aides,[28,29] not only for the head and neck, but also for the total body.[20,25] The patients must clearly understand that their lifestyles affect their symptoms in many ways. Work habits, stress, posture, muscle overloading, and referred pain all have an impact.[6,9-12]

Supportive Therapies. Larger TMD clinics[20,28] often retain the services of psychologists,[2] physical therapists,[22] and others.[17] In rural areas these services are mostly unavailable. However, the dentist can prescribe an appropriate program for a patient by providing visual aids, exercises for muscular relaxation (passive stretch) and ways of managing stress.

Up to this point in the comprehensive consultation appointment, no x-rays have been taken or study models completed. The reason is that a significant number of patients should not be further treated for TMD if symptoms indicate that postural faults or oral habits are contributing to their pain.

Some patients are given a set of exercises that relate to their problem to do at home, along with patient-awareness materials. Usually a two-week period of time will be sufficient to determine if further treatment is required.[13,15]

All patients are taken off any pain-relieving drugs[6] in order to gain an accurate assessment of the pain pathways before treatment begins.

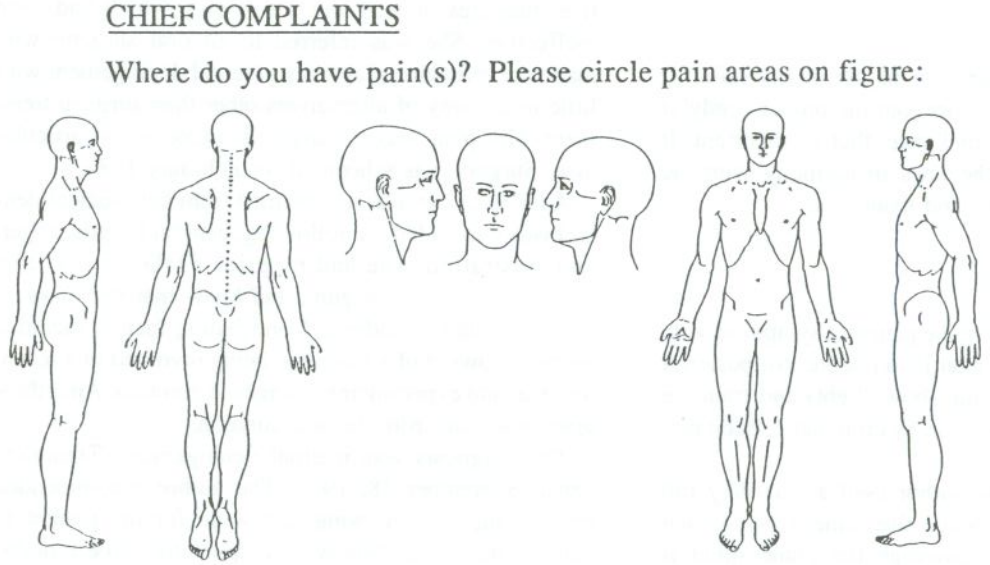

Figure 1
The medical/dental questionnaire body forms on which patients chart all pain from head to toe.

Clinical Studies. If treatment is indicated, face-bow mounted diagnostic models and transcranial radiographs are taken. The author consistently uses transcranial radiographs[30,31] to support the diagnosis. Usually a stabilization or functional appliance is placed at the next appointment.

Treatment Plan. A tentative treatment plan for TMD is agreed on and encompasses any or all of the following.

Phase I—The Comfort Phase (Medical): study models, transcranial radiographs, orthotic appliances, exercises, stress reduction techniques, diet evaluation[7,8] or referrals to specialized services available in the community such as physical, medical, chiropractic or psychological therapy.

Phase II—The Stabilization Phase (Dental): The stabilization stage is a treatment plan based on the patient's needs. Compensatory adaptation tooth positions that occurred while the disk was displaced must be undone. Posterior open bites (i.e., unstable dental occlusions) must be corrected to make teeth occlude in the newly reduced joint. This could involve functional appliances,[32,33] overlay partials, a denture, proper restorative measures to include occlusal equilibration, if indicated, to correct malocclusion, and/or behavioral modification prescribed exercises.

This phase should never be started until phase I is completed, except in cases where functional orthopedic appliances can accelerate treatment and serve in lieu of another orthotic.

III. Second Appointment

The diagnosis and treatment plan have been established. An intraoral appliance has been indicated. Which appliance should you use?

Considerations

Complications can occur with the use of any splint. It is not necessarily the appliance, but the proper condylar position obtained by the appliance, that is important. It is important to line up the jaws in harmony with the patient's muscles, tendons, and ligaments.

Phase I Goal

The first goal is to relieve the patient's symptoms with the splint and the second goal is to restore lost posterior vertical dimension (no matter how slight) and train the patient to maintain this position by eliminating habit patterns that intrude teeth.

Until 15 years ago, the author used a maxillary full arch stabilization splint. Since that time a mandibular posterior bilateral partial coverage flat plane splint is usually relied on. Patients find them more comfortable and can eat and talk better. They are easier to adjust. The author recommends that only the lingual tips of the upper first molars should touch the flat surface of the lower appliance.

Balancing the Appliance

Patients should be seated upright and asked to put their lips together, take a deep breath, and let it out, swallow and lightly touch the splint. Then they are asked which side touches first.

Take time to firmly re-establish the treatment plan and relaxation exercises. The treatment usually takes two to six months and needs to be monitored frequently at first, later as needed.

There are relatively few complicated exceptions.[34,35] Whiplash will usually require monitoring for about two years. It involves cervical involvement and torn ligaments and treatment should be coordinated with a physical therapist. Whiplash was the precipitating factor for 32 of the patients in this study. If the patient is wearing a cervical collar, some form of splint is usually required. The patient should be asked how they feel each time they present for treatment. Any improvements should be noted, as well as any remaining symptoms.[18]

The following two case studies illustrate the thesis that patients can be successfully treated by the general dentist.

Case Report I

A 34-year-old white female presented to the author seeking a fourth opinion for her chief complaint, a TMJ problem with pain in her face, cheek, and TMJ. Her family physician had prescribed Naprosyn and conservative measures of heat and a soft diet, which had been ineffective. She was referred to an oral surgeon who made the following diagnosis: internal derangement with little in the way of alternatives other than surgical treatment. His plan was to surgically remove the articular disk. Surgery was scheduled for February 1982.

Additional complaints obtained from her medical/dental history included the following: general fatigue, anger, and frustration. She had no prior TMD history. She clenched and chewed gum, and knew that stress was a factor she had to address. Contributing factors included being the owner of a business, being involved in a recent divorce, and experiencing changes in emotion. An arthrogram was sent from the oral surgeon.

The diagnosis was internal derangement. Treatment began September 18, 1981. The author recommended eliminating gum chewing and ways for the patient to manage her stress. She wore a splint for three months, then discontinued wearing it on her own. She was seen

in the author's office for three appointments during the first month only.

A follow-up call on August 18, 1982, revealed that all symptoms were completely gone. A follow-up letter on February 4, 1988, indicated a positive progress report.

Case Report II

The second case reported a 28-year-old white female seeking a third opinion for her chief complaints, pain and grating noises in her right joint. The first oral surgeon seen had recommended TMJ surgery. The second oral surgeon seen had referred the patient to the author for an opinion.

The patient's additional complaints included easy fatigue, cold hands and feet, bite felt off, difficulty opening her mouth, difficulty chewing, and pain in the ears and throat.

The muscles that were tender to palpation included the TMJ lateral to joint, lateral and medial pterygoid, mylohyoid, trapezius on the right side, and the sternocleidomastoid bilaterally.

Transcranial radiographs revealed bilateral posterior displacement of the condyles and flattening of the articular surface of the right condyle.

Contributing factors included job stress and grinding of the teeth. The diagnoses were internal derangement, myofascial pain of the head and neck, and osteoarthritis.

Treatment was begun on March 31, 1984, and involved 14 appointments. The MORA was the splint of choice and relaxation techniques included (1) 2, 2, 3 finger jaw opening exercises, (2) neck stretches, and (3) Rocabado's "rest position of the tongue" to break the clenching habit. This treatment stresses tongue up—lips together—cheeks relaxed—breathe through the nose from the diaphragm. The treatment time could have been shortened if the author had used a functional orthopedic appliance instead of a splint. The treatment was completed December 3, 1985.

A follow-up phone call was made on May 2, 1990, and revealed that the patient felt wonderful, there were no joint noises, and she was doing quite well.

Summary

Successful treatment of TMD is within the scope of the general dentist, providing the practitioner has an understanding of the patient's total problem, the treatment options, and a willingness to work with the patient. Documentation and use of a participatory treatment plan are essential to successful treatment.

In addition to the symptoms associated with internal derangement of the TMJ, cervical and shoulder muscles are usually involved and must be identified as part of the treatment plan. The dentist must understand the relationship of the total body to the TMJ. The role of posture, referred pain, faulty work habits, muscle overloading, previous injuries, and life experiences must be addressed for successful treatment.

This study of 382 patients spanned a 10-year period including follow-up. Management of occlusally related problems should take into account that:

1. Splints may placate or relieve symptoms, but not necessarily provide a cure.
2. The success of conservative management strongly depends on expanding on the chief complaint, the patient's awareness of the total problem, and the patient's participation in a wellness program.
3. A comprehensive medical/dental history and thorough oral, head, and neck examinations are essential for a proper diagnosis. The history must contain full body images (head to toe) for the patient to identify all areas of pain.
4. Therapists must have the management skills to treat the diagnosis.

Results of the study indicated that:

1. No patients needed surgery.
2. 86% of the diagnoses were both internal derangement, and myofascial pain of the head and neck. (Note: 35% were found to have osteoarthritis, which is not a factor, as tissues will respond to proper treatment.)
3. Whiplash was the precipitating factor for 32 patients.
4. The breakdown of TMD by ages showed a range of 10 to 77 years, with the greatest concentration being between the ages of 20 and 50.
5. The breakdown of TMD by sex revealed that 79% were female and 21% were male.

Using multiple disciplines and nontraditional, as well as traditional modalities, allows for greater flexibility in finding a successful plan. TMD specialists are successfully using innovative techniques not recognized by many teaching institutions. It is time that recognition and credence are given to a multidisciplinary approach to TMD.

Dentistry has been a leader in teaching prevention for over 40 years, and now has an opportunity to lead in the area of TMD.

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