

# Otolaryngic Myofascial Pain Syndromes

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It has been long recognized in the otolaryngic community that despite great effort dedicated to the physiology and pathology of the ear, nose, throat/head and neck, there are a number of symptoms, including pain in various locations about the head and neck, which cannot be explained by traditional otolaryngic principles. The tenets of myofascial dysfunction, however, as elucidated by Dr. Janet Travell, explain most of these previously unexplained symptoms; furthermore, treatment based on Dr. Travell's teachings is effective in relieving these symptoms.

## Introduction

Myofascial dysfunction is a muscle disorder characterized by trigger points, taut bands, muscle shortening, plus local and/or referred symptoms. Myofascial dysfunction develops as a result of a poorly understood predisposition in certain individuals, plus muscle abuse. The muscle abuse can be classified into overuse, underuse, misuse, and trauma categories.

Pertinent history in patients with this disorder includes: long hours sitting with poor posture, particularly in front of a computer, or long hours in a vehicle behind a steering wheel; clenching, bruxism, or dental attrition; and many hours with poor posture while sleeping, reading, or watching television. The most common type of trauma is recent or remote whiplash. There may be nutritional, metabolic, or endocrine inadequacies, such as hypothyroidism, parasitic disease, chronic infection, vitamin deficiency, or anemia. Stress also may play a role [1••,2,3,4].

The prevalence of individuals with myofascial disorders of the head and neck who are in need of treatment is estimated to be 3.6% to 7% [5•]. It is estimated that 17,800,000 work days are lost each year as a result of this problem for every 100,000,000 full-time working adults in the United States [5•]. There is a women to men ratio of 3:1 to 9:1 in those seeking care for this problem; the predominance of women seeking treatment may result from their greater health awareness [5•].

Ear, nose, and throat symptoms often are the major presenting complaint in patients with myofascial dysfunction

of the head and neck muscles [6]. These problems comprise a significant part of otolaryngic practice, and are being seen with increasing frequency. These patients may present with pain or a wide array of other ear, nose, and throat symptoms [6]. In the author's general otolaryngology practice over a period of 5 months, 106 of 257, 41%, of consecutive new patients presented with a chief complaint caused by a myofascial disorder (Table 1).

By the time these patients are referred to otolaryngologists, they typically have undergone multiple ineffective treatments over a long period of time, by a variety of medical disciplines. In the worst and most longstanding cases, there often is a history of: multiple dental extractions; multiple varying types of dental splints; multiple expensive therapies oriented toward dental occlusion or temporomandibular joint adjustments; and ineffective manual therapies by multiple practitioners who are not knowledgeable in myofascial disorders.

## Symptoms

The reader is referred to the Simons-Travell text [1••] for detailed descriptions of pain referral patterns.

## Head

Local or referred pain or tenderness anywhere about the head or neck often may be experienced. Patients may erroneously describe this as "migraine." Myofascial pain can, however, be one of the triggers of a classical migraine attack in some patients, just as food or chemical allergy/sensitivity or lack of sleep can be a trigger (see case presentation number 3). Tenderness and paresthesias of the scalp can result from temporalis myofascial dysfunction.

## Nose

Nasal pain, congestion, "obstruction," or pressure can occur, and may be associated with midfacial similar symptoms. We have done these patients a disservice in the past as they have been termed as "nasal neurotics," or described as having "paradoxical nasal obstruction." Myofascial dysfunction of the masseters and pterygoids often is the problem here.

## Sinus

Multiple bouts of so-called "sinusitis" not responsive to antibiotics and chronic/recurrent pain in the maxillary or frontal areas, attributed to the corresponding sinuses, can occur. An occasional patient has undergone ineffective

**Table 1. Breakdown of various presenting symptoms of myofascial dysfunction in 106 patients**

| Symptom                                  | Patients with symptom, n* | Patients with symptom, % |
|--|---------------------------|--------------------------|
| Facial or sinus pain                     | 43                        | 41                       |
| Ear pain                                 | 39                        | 37                       |
| Hearing loss; ear blockage; ear fullness | 22                        | 21                       |
| Dizziness                                | 19                        | 18                       |
| Neck pain                                | 17                        | 16                       |
| Tinnitus                                 | 15                        | 14                       |
| Headache                                 | 14                        | 13                       |
| Throat discomfort                        | 11                        | 10                       |
| Pain in teeth/gums                       | 2                         | 2                        |
| External ear canal paresthesia           | 2                         | 2                        |
| Nasal congestion                         | 1                         | 1                        |
| Facial paresthesia                       | 1                         | 1                        |

\*Many patients presented with more than one symptom.

endoscopic sinus surgery in an attempt to relieve the pain, based on an abnormal CT scan of the sinuses. The otolaryngic community is coming to the consensus that positive CT scans of the paranasal sinuses do not correlate well with the discomfort in the area of the sinuses and that sinus surgery to relieve chronic sinus area pain based on radiologic studies alone has a poor prognosis for relief of that discomfort [7].

Symptoms referable to the paranasal sinuses typically are from myofascial involvement of the masseters, pterygoids, zygomaticus, and sternocleidomastoids.

### Ears

Patients may experience pain, clogging, foreign body sensation, "blocked" ears, hyperacusis, hypoacusis, hearing loss, tinnitus, or dizziness. All otolaryngic studies are normal, including the audiometric evaluation. These symptoms typically are caused by problems with the pterygoids, masseters, or the clavicular division of the sternocleidomastoid.

There has been considerable attention to the so-called otomandibular syndrome as a mechanism to explain aural discomfort and a variety of other ear symptoms seen with myofascial dysfunction referable to the ear. Since masticatory muscle myofascial problems often are associated with the previously noted ear symptoms, and both the tensor veli palatini and masticatory muscles are innervated by the fifth cranial nerve, this theory assumes that with masticatory muscle dysfunction there also is simultaneous dysfunction of the tensor veli palatini. In that scenario, the tensor veli palatini, not operating correctly, will not allow the eustachian tube to adequately aerate the middle ear, and the resultant inadequate aeration is responsible for a variety of ear symptoms.

The tympanogram, however, which is a sensitive and reliable test for middle ear aeration, is normal in all of these cases. Accordingly, this discredits the otomandibular theory. The audiogram and MRI of the internal auditory canals also are normal in these patients. This supports a site of dysfunction medial to the middle ear in these patients.

### Eyes

Patients can experience pain or pressure in or behind the eyes, visual blurring and light sensitivity (with normal visual acuity and normal ophthalmologic examination), reddening of the conjunctiva, and tearing. The muscles involved are primarily the frontalis, the superior portion of the orbicularis oculi, and the sternocleidomastoid.

### Throat/neck

Symptoms include local or generalized chronic/recurrent discomfort; chronic/recurrent sore throat; chronic/recurrent "tonsillitis"; dysphagia; odynophagia; a burning sensation; throat "congestion"; throat "drainage"; and voice irregularities. Patients may complain of lumps or "glands" in the neck, which are in fact muscles in severe myofascial spasm. The muscles most commonly involved are the pterygoids, anterior neck muscles, and the digastrics.

### Mouth

Patients may experience pain or a burning sensation of the mouth. The pterygoids, digastrics, and mylohyoids usually are involved in these patients. (The mechanism of this burning sensation and other paresthesias of myofascial origin about the head and neck are unknown; however, these symptoms clear along with resolution of the underlying myofascial dysfunction).

### Teeth/gums

Pain can be referred to the teeth and/or gums; this usually is caused by myofascial involvement of the pterygoids and masseters. These patients often present with a long history of multiple dental procedures directed unsuccessfully toward alleviating the pain; extractions and root canal procedures are commonplace, especially on the maxillary molar teeth.

### Salivary glands

These patients present with a long history of chronic and recurrent pain in the area of the parotid or submaxillary glands, presenting with a misdiagnosis of parotitis or submaxillary

sialadenitis. Multiple trials of antibiotics have been without help. Pain which worsens with chewing and swallowing is characteristic of both myofascial dysfunction of the digastrics and masseters as well as being a characteristic of obstructive affections of these two salivary glands; this can confuse the clinical picture and delay correct diagnosis. Careful examination, however, reveals normal salivary glands, but exquisitely tender masseters lying deep to the parotid, or tender digastrics lying deep and adjacent to the submaxillary glands.

### Examination

Muscle examination reveals taut bands, trigger points, muscle shortening with attendant limited range of motion, and muscle tenderness [1••,3]. (Myofascial symptoms may fluctuate. If the examination is done on a day when the patient is asymptomatic, the muscle findings, and especially the muscle tenderness, may be diminished. Accordingly, it is important before muscle examination to ask the patient to rate the severity of his symptoms at that particular time).

### Therapy

There has long been misplaced attention toward describing myofascial problems of the head and neck by the misnomers "TMJ" (temporomandibular joint syndrome) or "TMD" (temporomandibular joint dysfunction), with attendant misdirected attention to the temporomandibular joint. Also, there has been undue attention to dental occlusal irregularities as a cause of this problem [2,5•,8]. In the author's series of 106 consecutive patients presenting with ear, nose, throat, head/neck symptoms of myofascial origin, no patient had a temporomandibular joint derangement or occlusal irregularity causing the symptoms. The symptoms all were entirely caused by myofascial dysfunction. Myofascial dysfunction of the head and neck and masticatory muscles is a muscle disorder and is only very rarely related to a dental occlusion or temporomandibular joint problem. Accordingly, therapeutic efforts oriented toward a supposed temporomandibular joint or a dental occlusion etiology of this disorder are only rarely effective.

Additionally, there has been a great deal of interest in temporomandibular joint noises and deviation of the mandible upon opening the mouth. These noises or mandible deviations occur in up to 50% of nonpatient, asymptomatic populations and few of these individuals progress to symptomatic status [5•]. Temporomandibular noises on occasion, however, may be secondary to myofascial spasm of the masticatory muscles, rather than an indication of primary joint pathology (see case presentations 4 and 5). Temporomandibular joint noises are rarely important as indicators that there is a primary temporomandibular joint disorder, which itself is causing, or is going to cause, problems.

Although extensive attention to achieving perfect dental occlusion or exhaustive manipulations of the temporomandibular joint is not indicated, a simple flat plane

occlusal splint covering all of the maxillary or mandibular teeth is, however, often very helpful [2,5•,8,9].

Effective treatment involves educating the patient in discontinuing the precipitating and perpetuating factors: muscle abuse as a result of chronic head forward rounded shoulders posture must be corrected; muscle abuse from sitting many hours in front of (typically) a computer without breaks and with poor posture must be avoided. An at-home stretching program should be instituted. If routine screening laboratory tests—to include serum vitamin levels, a blood chemistry profile, complete blood count with indices, erythrocyte sedimentation rate, and thyroid hormone levels—are abnormal, they must be dealt with. Deactivation of trigger points should be done. Manual techniques often suffice, although mature long-standing trigger points may respond better to injection or dry needling [1••,10].

A single muscle or single muscle group may be primarily responsible for a presenting ear, nose, or throat symptom. Typically, however, multiple muscles of the masticatory, neck, and upper shoulder groups typically are all simultaneously involved with myofascial dysfunction, if to a lesser degree; all three muscle areas should be evaluated and addressed therapeutically when involved (Table 2).

Correct diagnosis and treatment by knowledgeable practitioners often result in excellent clinical outcomes in this disorder.

### Case Presentations

#### Case 1

A 55 year-old woman presented with a 15-year history of chronic bimaxillary pain, which she and multiple practitioners had attributed to sinus disease. She had undergone multiple unsuccessful medical trials. A trial of allergy shots was not helpful. Her occupation requires many hours daily sitting at a computer. She was aware that she often clenched her teeth.

Examination revealed tenderness of the neck, masticatory, and upper shoulder muscles. The complete ear, nose, and throat/head and neck examination was otherwise normal. A CT scan of the paranasal sinuses was normal (Fig. 1).

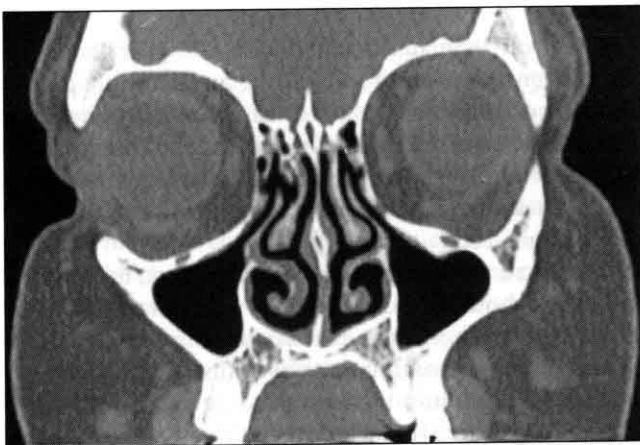
She was given information regarding precipitating and perpetuating factors (to include optimal care of her muscles while at a computer) and a home stretching program. She obtained an occlusal splint and was referred to a physical therapist who was knowledgeable in myofascial disorders. The patient noted that she was dramatically better after one therapy session. At completion of the course of physical therapy, she was completely pain free for the first time in 15 years and has remained pain free at the 6-month follow-up.

#### Case 2

A 72 year-old minister presented with a 3-month history of left-sided scalp paresthesias and tenderness. He gave a history of sitting many hours per day at his desk. Physician consultations and medications had been without help. He presented

**Table 2. Reasons for therapeutic failure**

1. Misconception that myofascial head and neck problems are caused primarily by dental occlusion problems, with attendant inordinate, ineffective, and expensive attention to obtaining perfect occlusion, with extensive orthodontic procedures, and occasionally full mouth restorations
2. Misconception that myofascial head and neck problems are primarily of temporomandibular joint origin, with extensive treatments directed toward the temporomandibular joint, rather than recognizing this as primarily a muscle disorder
3. Too much reliance upon an occlusal splint alone.  
An occlusal splint is important in most of these cases, but when things are not cleared up promptly, there is a tendency toward multiple and expensive splint adjustments, or endless trials of various types of splints. There often is neglect of the other important aspects of treatment: patient education; home stretching program; recognition and deactivation of trigger points.
4. Too much attention to therapy alone, without addressing the other important factors, such as patient education regarding: precipitating and perpetuating factors; home stretching program; occlusal splint when indicated
5. Poor patient compliance with home stretching program; avoiding precipitating and perpetuating factors; keeping appointments; wearing occlusal splint (this may be related to poor patient education efforts).
6. Trigger points are not being deactivated; physician/therapist is not correctly addressing trigger points
7. There may be a true ear, nose, or throat disorder, rather than/in addition to, a myofascial disorder.

**Figure 1.** Computed tomography scan of the paranasal sinuses.

with these symptoms to an otolaryngologist as he had been told that this was a sinus or allergy problem.

Examination revealed a head forward, rounded shoulder posture and tenderness of the upper shoulder, neck, and masticatory muscles, worse on the side ipsilateral to the discomfort. The temporalis muscle ipsilateral to the scalp discomfort was particularly tender.

Therapy consisted of an occlusal splint, information regarding muscle care while at his desk, and a stretching program. The result was complete clearing of the problem.

He noted that occasionally, with return of the scalp discomfort, he could abolish the discomfort by correcting his posture and stretching.

### Case 3

A 56 year-old registered nurse presented for evaluation of a possible sinus disorder, with an 8-year history of L-sided facial pain related to the left frontal sinus, left maxillary sinus, and left orbital area. Further history revealed that these attacks were preceded by left upper shoulder and left neck pain; the facial/"sinus" symptoms typically were followed by a full-blown left-sided migraine attack. She was evaluated by two neurology consultants; both consultations yielded a diagnosis of migraine. An MRI was normal. Zomig (AstraZeneca, Wilmington, DE) relieved the full-blown migraine attacks.

The ear, nose, and throat/head and neck examination was normal, except that with the onset of the left shoulder and neck discomfort, trigger points and taut bands were found in the left trapezius and left neck muscles. She already had an occlusal splint, which had been prescribed by her dentist after discovering dental attrition.

Stretches and trigger point deactivation were recommended. Currently, when she notes the onset of discomfort of the upper shoulder and neck, manual therapy directed toward trigger point deactivation aborts the impending migraine attacks.

In this case, what presented as a possible sinus disorder was in fact a myofascial disorder, triggering migraine attacks.

### Case 4

This 45 year-old male was referred with a 2-week history of severe right facial pain, unresponsive to antibiotics. A diagnosis of parotitis had been entertained, but antibiotics appropriate for that disorder had been ineffective. He also gave a history of jaw popping while chewing.

Examination revealed tenderness of the upper shoulder, neck, and masticatory muscles and exquisite tenderness of the ipsilateral masseter corresponding to the location of the facial pain. Deep palpation of the masseter reproduced the presenting typical pain.

He was given an occlusal splint, and instructed in a stretching program and physical therapy emphasizing trigger point deactivation. He quickly responded to this. The popping noises in his jaw ceased.

This is a case of myofascial dysfunction presenting as a case of atypical facial pain or atypical parotitis.

### Case 5

This 30 year-old female presented with a 5-year history of bilateral chronic ear pain. She had undergone multiple visits to primary care physicians and otolaryngologists, being given various diagnoses and ineffective prescriptions. She was aware of chronically clenching her teeth and gave a history of temporomandibular joint clicking.

Examination revealed bilateral tenderness of the neck, upper shoulders, and masticatory muscles, with particular

involvement of the masseters and clavicular division of the sternocleidomastoids. Her countenance was one of depression, anxiety, hostility, and skepticism.

The trigger points of the masseters and sternocleidomastoids were injected bilaterally, followed by a stretch of these muscles. The pain dramatically and immediately ceased. This was the first time in 5 years that she had been pain free. In addition, the TM joint clicking sounds disappeared and she was able to open her mouth more widely.

She was given an occlusal splint and physical therapy was scheduled. When seen back at 1 week, her countenance had dramatically changed to that of a pleasant, friendly, outgoing person. She stated that one of her friends had noticed this and asked, "What have you done for yourself?"

This patient had the typical "mask of pain" as referred to by Dr. Lawrence Funt (Funt, personal communication). The "mask of pain" refers to frown lines and to a sallow, ashen, change in the skin, which may occur in the most longstanding cases of facial pain from myofascial involvement.

Although on her follow-up visit at 1 week, she was still symptom-free from the injections alone, long-term relief depends on completing a course of physical therapy, a home stretching program, and avoidance of clenching and other precipitating and perpetuating factors.

In this case, as in case 4, the temporomandibular joint clicking/popping was secondary to the condyle being jammed forcefully against the fossa and articular cartilage by the myofascial spasm of the occlusal masticatory muscles. Myofascial release relieved the discomfort and abolished the joint noises; these sounds were secondary to the myofascial dysfunction, not an indication that a primary temporomandibular joint disorder was responsible for these patients' symptoms.

## Conclusions

Since head and neck symptoms are frequently due to myofascial disorders, physicians in all disciplines concerned with disorders of the head and neck should become familiar with the diagnosis and treatment of this problem. This capability requires development of tactile skills which cannot be learned from the literature alone. Just as a surgical resident must learn manual technical skills at the side of an experienced surgeon, the clinician endeavoring to learn myofascial diagnostic manual skills must do this in a hands-on setting, at the side of a knowledgeable instructor who can demonstrate shortened muscles, taut bands, trigger points, and twitch responses [11••]. There are a number of workshops and seminars dedicated to this across the country [11••].

Symptoms of discomfort referable to the ear, nose, and throat which are not of true ear, nose, and throat origin are frequently seen, and are usually due to myofascial dysfunction.

TMJ syndrome and temporomandibular dysfunction, TMD, are poor terms to describe what is actually myofascial dysfunction of muscles of the head and neck. These terms are inaccurate and confusing and should be discontinued when referring to this disorder. The use of these terms should be

limited to the extremely rare case of primary temporomandibular joint pathology. Accordingly, since this is primarily a muscle disorder, diagnostic and therapeutic efforts should not be focused on the temporomandibular joint or on intermaxillary occlusal irregularities, but on diagnosis and treatment of the muscle/myofascial disorder.

Treatment outcome is determined by patient compliance, correct diagnosis, and correct treatment and is influenced by the duration of the problem and the number of muscle groups involved. Effective treatment must include recognition and deactivation of trigger points by a practitioner truly skilled in myofascial disorders.

In minor cases of short duration, habit modification alone, an occlusal splint alone, or therapy alone may individually yield good results. The more chronic and complicated cases, however, require all three therapeutic modalities.

Particularly in these advanced cases, patient compliance is a must; in order to achieve patient compliance, considerable effort should be directed toward patient education. Patients must be encouraged that the proposed treatment program, as opposed to previous therapies they may have been through, has real promise and is worth their time and energy, both of which are required in the difficult case.

In our enthusiasm to diagnose and treat myofascial disorders, we first must rule out other, often serious problems. In the case of ear, nose, throat, and sinus symptoms, true disorders of these areas must first be considered. There should be a low threshold for ancillary studies and ancillary consultations.

Myofascial disorders of the head and neck muscles are being seen with increasing frequency, probably because of our increasingly sedentary lifestyle. Significant medical resources are being expended on this problem, often on useless diagnostic and therapeutic modalities.

After years of discomfort, misdiagnoses, and ineffective therapies, some of these patients may understandably present with depression, skepticism, anxiety, and hostility. We should not allow this disagreeable presenting profile to dissuade us from fully evaluating these patients. With proper diagnosis and treatment, they often become some of our most gratifying and appreciative patients.

## References and Recommended Reading

Papers of particular interest, published recently, have been highlighted as:

- Of importance
- Of major importance

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This seminar series is the premier workshop series dealing with myofascial disorders.