The Omohyoideus Myofascial Pain Syndrome: Report of Four Patients

*Abstract*

Pain in the shoulder, neck, arm, and hand, and in the scapular, supraclavicular, mandibular, and temporal regions may be caused by the omohyoideus myofascial pain syndrome. This may be primary, caused by vomiting or by other intense use of the muscle, or it may be secondary, occurring as a result of rheumatoid myositis, ankylosing spondylitis, nonankylosing rheumatoid spondylitis, gouty myositis, or other disorders. The syndrome can be successfully treated by gently injecting the inferior belly of the omohyoideus muscle and the secondary trigger points with a combination of medications that will break the pain/spasm cycle.

Michael R. Rask, M.D.

*Michael R. Rask, M. D.*

After receiving his M.D. degree from the University of Oregon Medical School in 1955, Dr. Rask completed his internship at Kings County Hospital in Brooklyn and later returned to Oregon for his orthopedic residency. He is currently in private practice in Las Vegas, Nevada, specializing in neurological orthopedic surgery.

Dr. Rask belongs to a number of regional and national medical societies, including the American Academy of Neurological and Orthopaedic Surgeons, the American Federation for Medical Accreditation, and the Neurological and Orthopaedic Institute. Dr. Rask is chairman of the Board of Neurological and Orthopaedic Surgeons and editor-in-chief of The Journal of Neurological and Orthopaedic Surgery. He is also chairman of the Neurological Orthopaedic Institute.

Dr. Rask has published nearly 200 articles in numerous major medical journals, and he has also presented a number of lectures and scientific exhibits at major scientific meetings.
The Omohyoides Myofascial Pain Syndrome: Report of Four Patients

By Michael R. Rask, M.D.

Abundant material has been written about the thoracic inlet (or outlet) syndrome, the scalenus anticus muscle syndrome, the scalenus medius or posterior muscle syndromes, and cervical disk disease, but no attention has been paid to a painful and not infrequent muscle syndrome that has come to my notice over the years. The inferior belly of the omohyoides muscle can cause a painful and disabling cervical-glenoappendicular disorder. This article will discuss four cases of this disorder, give some notes on the problem's etiology, and suggest a method for conservative treatment.

Patient One

This 54-year-old businessman had injured his lower back many years ago while lifting heavy objects. His L4-5 disk was damaged, and he had received no conservative therapy. After two unsuccessful lumbar laminectomies done by two different neurosurgeons, the patient developed severe and relentless cauda equina claudication (without intermittency). The patient responded well to the conservative therapeutic program I generally use for postoperative arachnoiditis.1 (This consists of intravenous Colchicine, sodium salicylate, calcium gluconate, oral Colchicine and Anturane,2 and trigger point injections with Marcaine,3 Sarapin,4 and gamma globulin.3)

After this conservative therapy, the patient returned home without much lower back or lower limb pain. However, he later became ill with influenza, and while he was vomiting, he had a sudden onset of severe pain in the neck and left shoulder. After several days of intense discomfort, the patient also began having severe, unrelenting left-sided temporoparietal headache. The patient went to several practitioners in his hometown, who conducted numerous radiographic and electrical tests. These clinicians simply told him that it was related to his previous unsuccessful lower spine surgery.

When I first examined the patient for this painful cervical condition in July, 1983, he was unable to extend or rotate his head and neck to the right without experiencing severe pain in the left supravacular area. This burning pain radiated into the left shoulder anteriorly and into the upper left brachium/elbow regions. There was also pain in the scapular insertion of the levator scapulae superioris muscle.

Chest x-rays showed no evidence of a superior sulcus tumor, while a CT scan revealed some C5-6 disk "build-up" beneath the posterior longitudinal ligament without significant asymmetry. All other testing was negative, including laboratory procedures. (The patient did have mild adult-onset diabetes, but this was under good control with Diabinese.)

Examination of the patient's neck revealed extreme tenderness in the inferior belly of the omohyoides muscle where it traversed the upper brachial plexus (Figure 1). No lymphadenopathy was present, nor was there marked tenderness in the brachial plexus itself.

The subclavian artery pulsation could not be altered with the various arm abduction and Valsalva procedures (negative Adson's and hyperabduction tests) that I attempted. The patient also had tenderness in the anterior bicipital groove of the left shoulder, in the scapular insertion of the levator scapulae superioris tendon, in the belly of the brachioradialis muscle, and in the midbelly of the temporalis muscle (just above the zygomatic arch).

I found no sensory deficit (for light touch, temperature, or pinwheel pain) and no deep-tendon reflex deficit in the limbs. Nor was there muscle weakness anywhere in the upper left limb.

Manipulating the inferior belly of the patient's left omohyoides muscle re-created the severe neck, shoulder, and arm pain and headache. I carefully injected this muscle belly with Marcaine (bupivacaine hydrochloride 0.5%), gamma globulin, and Sarapin, using a 30 gauge ½ inch atrumatic, disposable needle. This completely relieved the patient's pain.

On two subsequent occasions, I injected the secondary trigger points (in the bicipital groove and the scapular insertion of the levator scapulae superioris muscle), the muscle belly of the brachioradialis (at the left elbow), and the trigger point in the temporalis muscle in a similar manner. The patient was then able to return to his home with no pain and with no limitations to the movement in his shoulder and neck. His headache was also gone. Six months later I saw this patient again and found him to be totally asymptomatic.

Patient Two

This 49-year-old teacher developed food poisoning after eating some tainted fish. He became violently ill and was wretching and vomiting. Toward the end of the vomiting attack, he had a sudden burning pain in the right side of his neck and in his right shoulder blade, and aching in the right mandibular region. This pain persisted for three weeks. Buffered aspirin seemed to relieve the pain slightly. The patient found that turning his head to the left caused the pain in his neck and shoulder to become more intense. The pain also seemed worse in the morning.

When I examined this patient three weeks after the onset of the syndrome, he had no sensory, motor, or deep-tendon reflex deficits. Radiographs of his neck showed no disk narrowing, and a chest x-ray showed no pathology there.

The inferior belly of the patient's omohyoides muscle was extremely tender to palpation, and the brachial plexus was slightly tender. There was also some tenderness at the cervical insertions of the lower three heads of the levator scapulae superioris muscle on the right side. The patient also had tenderness deep in the right levator scapulae superioris bursa on the inner upper aspect of the right scapula, and there was slight temporalis muscle tenderness above the zygomatic arch. Hyperextending the patient's head and turning it to the left (positive Spurling's test) aggravated his discomfort. (In Spurling's test for cervical radiculopathy, the pain and paresthesia can be reproduced by vertical compression of the head upon the neck. The neck may be extended, flexed, or bent laterally.)

I treated this patient by injecting the inferior belly of the right omohyoides muscle with 2 cc's of 0.5% Marcaine, ½ cc gamma globulin, and 1 cc Sarapin, taking great care not to anesthetize the right phrenic nerve (see Figure 2). This completely relieved the patient's discomfort.

On the second visit, I injected the inferior belly of the omohyoides muscle again, and I also injected the trigger points in the levator scapulae superioris muscle insertions and deep in the trapezius muscle (at the insertion of the omohyoides muscle into the scapula). Three days later, the patient had no remaining symptoms.

Patient Three

After a severe rear-end collision in which her vehicle overturned, this 37-year-old secretary had developed Crohn's disease and nonankylosing rheumatoid spondylitis (NARS).6 This had occurred 12 years before I saw her.) After seven years of chronic inflammatory disease in her neck, the patient began gradually to develop pain in the right supraclavicular area, the right shoulder, and the right upper brachium. She also experienced intense spasm of the levator scapulae superioris on the right side, and she had aching in her jaw, temporalis area headache, and burning in the inner upper aspect of the right scapula. She
The phrenic nerve is in close proximity to the inferior belly of the omohyoides (retracted). Note also the proximity of the subclavian artery, the subclavian vein, the cupula of the lung, and the brachial plexus. These vital structures must not be disturbed in the injection procedure used in treatment. It is thus essential to employ atraumatic injection techniques, using a number 30 gauge ½ inch needle and injecting only small amounts of the medication mixture. Long-acting bupivacaine (Maricaine 0.5%) seems to be ideal for breaking the muscle pain/spasm cycle. (Illustration from Atlas of Orthopaedic Exposures. Toufick Nicola, M.D. Baltimore: The Williams and Wilkins Company, 1966, pg. 63. Reprinted with the permission of the Williams and Wilkins Company.)

also had slight numbness in the tips of her fingers. Non-steroidal anti-inflammatory medications afforded her only slight relief, and they often interfered with the Crohn’s gastronenteritis.

When I examined this patient, I found that she had the characteristic trigger point pain and tenderness in the inferior belly of the omohyoides muscle. There was also tenderness of the brachial plexus. Radiographs of her neck revealed no disk narrowing, and there was no evidence of ankylosing spondylitis (the basis for the diagnosis of NARS). Spurling’s test was positive for right shoulder and upper limb pain, but the patient’s cervical movements were markedly limited, due to the inflammatory stiffness of her disease. I found no real sensory change or motor weakness and no deep tendon reflex abnormality in either upper limb. Maneuvers to identify thoracic inlet (or outlet) syndrome and scalenus anterior muscle syndrome were negative.

I injected the inferior belly of the patient’s right omohyoides with ½ cc’s of 0.5% Marcaine, 1 cc Sarapin, and ½ cc gamma globulin. This completely relieved the pain in her supraclavicular region and her right shoulder and mandibular areas for two to three months.

The temporalis and levator scapulae superioris trigger points needed additional injections to give the patient greater pain relief. The usual ½ inch number 30 gauge disposable needle was used for all the injections. This helps to prevent the injection medication from escaping into the spinal nerve root dural sac and also eliminates the chance of injuring the cupula of the lung.

Patient Four

This patient is a 29-year-old concert pianist who had been in excellent health all of her life. Five months before she came to me, she was playing the piano fortissimo, when she suddenly felt an aching pain in the right cervical supraclavicular region, burning pain in the right shoulder, aching in the upper brachium, and pain in the upper inner shoulder blade. This pain waxed and waned for three months, occurring especially when she played the piano strenuously, and then it became constant. She also had some aching of her first digital web which had begun six weeks before she consulted me, and she had mandibular aching and intermittent headache. She had no numbness or tingling in her hand or upper limb. Left-sided neck movements increased her neck and arm discomfort. She had no history of neck injury.

When I examined this patient in June, 1983, I found no sensory, motor, or deep-tendon reflex deficit in her right upper limb. There was extreme tenderness in the inferior belly of the omohyoides muscle and some tenderness in the upper trunk of the brachial plexus (C5-6 roots). I found trigger points in the right bicipital groove, the brachioradialis muscle belly, the temporalis muscle belly (above the zygoma), the insertion of the levator scapulae superioris into the upper inner scapula, and the first dorsal intersosseous muscle. Moving her head to the left aggravated the patient’s pain. Cervical and chest radiographs revealed no abnormalities, and CT scans of the C4-5, C5-6, and C6-7 disks showed no damage or tumor. HLA B-27 and antinuclear antibody titers were normal.

I injected the inferior belly of the omohyoides muscle carefully with the injection technique described above, and the patient’s pain was completely relieved. I injected the other trigger points on two later occasions, and the patient returned to playing her piano fortissimo.

Anatomy of the Omohyoides Muscle

The omohyoides muscle arises from the upper margin of the scapula, near (and sometimes from) the suprascalpular ligament (see Figure 4). It attaches to the hyoid bone. The superior belly of the omohyoides is like an infrathyroid “strap” muscle, while the inferior belly of the muscle is thick and fleshy. This inferior portion of the
FIG. 3
View of the anterior neck. The omohyoides muscle is attached by a central tendon to the clavicle and first rib. The infrahyoid belly of the muscle is flat and straplike, but the inferior belly is bulky and fleshy. Primary inflammation and spasm of the inferior belly can cause neck and supraclavicular pain, burning in the shoulder and upper arm, elbow and lateral hand pain, shoulder blade pain (rhomboid and levator scapulae superioris muscles), temporalis headache, and mandibular aching. The muscle may also become inflamed secondarily as a result of disk disease, ankylosing spondylitis, nonanlyzing rheumatoid spondylitis, gouty arthritis, rheumatoid arthritis, and sprains or strains of the neck and shoulder girdle. (Illustration from Sobotta: Atlas of Human Anatomy, Helmut Ferner and Jochen Staabesand, eds. 10th English Ed. Baltimore: Urban and Schwarzenberg, 1983. Reprinted with the permission of Urban and Schwarzenberg.)

FIG. 4

Etiology of the Omohyoides Muscle Pain Syndrome

This omohyoides muscle pain disorder may be either primary or secondary. Any muscle can be the primary site for a painful contraction syndrome, and if the muscle is located in a strategic place, then the muscle pain/spasm cycle that occurs will have even more widespread results. The omohyoides is of course such a case, since the brachial plexus is located beneath it.

Because there is a great cross-over of nerve supply for the muscle (the ansa cervicalis), there can also be referred pain in similarly innervated structures. This can create seemingly unrelated symptoms such as temporalis headache, sympathetic pain in the levator scapulae superioris muscle, and inframandibular pain on the affected side. These structures share the segmental innervation of the omohyoides. In addition, since the upper trunk of the brachial plexus (C5 and C6 spinal nerve roots) is so near, contiguous inflammation from the muscle can cause the patient's neck and supraclavicular pain to progress into his or her whole upper limb. However, the trouble arises primarily from the two-bellied omohyoides muscle.

Primary isolated muscular disease may occur in the omohyoides muscle as a result of violent, intense vomiting (as in Patients 1 and 2) or violent shoulder and neck
movement (as in Patient 4). However, the syndrome can also occur secondarily, as a result of rheumatoid myositis, ankylosing spondylitis, non-ankylosing rheumatoid spondylitis (as in Patient 3), gouty myositis, cervical spine injuries, shoulder injuries, or disk damage in the region.

In addition to isolated viral inflammation of muscle or nerves, muscular inflammation may also occur as a result of joint diseases, trauma, spinal cord lesions brachial plexus neuropathy (Parsonage-Turner syndrome), polymyelitis, Guillain-Barré syndrome, polynueropathies (alcoholism, porphyria, arsenic intoxication), polyarteritis nodosa, lupus, rheumatoid arthritis, diabetes, beriberi, B12 deficiency, or other problems.6

For older patients, the clinician must also consider the possibility of polymyalgia rheumatica. (Temporal arteritis is a peculiar component of that disorder.)

**Diagnosis**

A diagnosis of primary omohyoid muscle myofascial pain syndrome should be made only after careful tactile examination of the patient's supraclavicular fossa, and after other causes for the cervical, supraclavicular, scapular, temporomandibular, and limb pain have been excluded.

One example of another cause can be seen in the patient who has Horner's syndrome (myotic pupil, ptosis of the eyelid, narrowing of the palpebral fissure, and anhidrosis and flushing of the affected side of the face) with a cloudy radiographic lesion in the cupola of the lung. These symptoms would indicate that the patient has a superior sulcus neoplasm, and we must assume this to be the case until it is proven otherwise. The clinician must search for all such possible causes of cervical disease, brachial plexus problems, and cervical spinal nerve root abnormalities and exclude them in order to arrive at the diagnosis of primary omohyoid muscle pain syndrome.

However, whether the omohyoid muscle inflammation or spasm is diagnosed as primary or secondary, the conservative therapy used is the same. Contraindications for this treatment would include a malignant infiltration of the brachial plexus (and omohyoid muscle), caries sicca, or any other treatable inflammatory condition. If any of these conditions are present, the clinician must not inject this area of the body to relieve pain.

Although the omohyoid muscle in the supraclavicular fossa will be extremely tender, there should be little, if any, sensory abnormality in the upper limb, and there should be no deep tendon reflex changes. In addition, the brachial plexus should not be more tender than the omohyoid muscle. There may also be trigger points found in the bicipital groove of the shoulder, the insertion of the deltoid into the humerus, the brachioradialis muscle belly at the elbow, the first dorsal interosseus muscle, the levator scapulae superioris muscle (both proximal and distal attachments), the rhomboid muscles, deep in the supraspinatus muscle where the omohyoid attaches to the transverse scapular ligament, the mid-cervical apophysial joints, the temporalis muscle, or even the temporomandibular joint itself.

**Treatment**

The injection treatment must be performed gently and with a technique as atraumatic as possible. I use a number 30 gauge ½ inch needle to deliver a small amount of the following mixture: ½ cc’s of bupivacaine (Marcaine 0.5%), 1 cc Sarapin, and ½ cc gamma globulin. This anesthetizes the fleshy inferior belly of the omohyoid muscle, which breaks the spasm/inflammation cycle that has caused the trouble. The simpler and gentler the technique used, the better and more effective it is for the patient.

Although it is not necessary to infiltrate the brachial plexus in primary omohyoid muscle pain syndrome, spinal nerve root blocks are quite effective in omohyoid muscle spasm that is secondary to cervical disk disease.

The clinician must also inject the secondary trigger point areas described above with the same mixture of medications and the same gentle technique. It is acceptable to use a small amount of triamcinolone acetonide with the medication mixture, but I have found that dexamethasone and other long-acting, slow-dissolving synthetic glucocorticoids are irritating and not too effective in the long run.

In addition to this injection, it often helps to give the patient prostaglandin inhibitors. I use a mixture of intravenous Colchicine, sodium salicylate, and calcium gluconate for this. Nonsteroidal oral anti-inflammatory medications such as Naprosyn* (naproxen), Clinoril*, and Tolectin* also seem to help. Narcotics, muscle relaxants, and tranquilizers such as Valium* (diazepam) should not be used in treating this painful syndrome. These drugs are habit-forming, and they do nothing to relieve the disorder.

Once the spastic muscle has been treated by injection, it is no longer necessary for the patient to rest the neck and limb.

---

*Naprosyn—Syntex Laboratories, Inc., Palo Alto, California.
*Clinoril—Merck Sharp & Dohme, West Point, Pennsylvania.
*Valium—Roche Laboratories, Division of Hoffman-LaRoche, Inc., Nutley, New Jersey.
Although I have not found surgical therapy to be necessary in treating the omohyoides myofascial pain syndrome, it is possible that a resistant and recurrent spastic muscle condition would make it necessary to divide the omohyoides muscle. If this has to be done, the muscle should be excised from the central tendon past the point where it crosses the patient's brachial plexus. At the same time, muscle and lymph nodes may be taken for biopsy.

Summary

The omohyoides myofascial pain syndrome described here can cause severe pain in the neck, shoulder, arm, elbow, and hand, and in the scapular, supraclavicular, mandibular, and temporal regions. The syndrome is due to spastic inflammation of the fleshy inferior belly of the omohyoides muscle. Once it has been determined that other more serious problems have not been the cause of the spasm and pain, the condition can be treated easily with a gentle, atraumatic injection technique.

References