Therapeutic Insight

By John F. Barnes, PT

Cervical and TMJ-Masticatory Muscle Interrelationships

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In the evaluation of patients with head/neck, facial, and TMJ pain, there is a high statistical correlation between cervical dysfunction, muscle contraction and temporomandibular joint dysfunction. My observation of patients seen at our medical center, particularly involving a high number of patients with past history of trauma, is one of co-existing problems which need simultaneous treatment. Over the years, I have been finding 87.5% of our "TMJ" referred patients also have cervical-somatic dysfunction and need appropriate therapeutic referral.

It should not be surprising that such a high statistical correlation exists, as there is,a close anatomic and neuro-muscular relationship between the jaw/masticatory muscle function and cervical function. From a coronal view on an X-ray, the lateral axis of jaw rotation as it moves from left to right, goes through the medial and lateral pole of the condyle backward toward a central axis point around the odontoid process of cervical #2. Very often, the cervical muscles are called upon to be primary jaw openers when there is a disc-lock or anterior disc displacement within the temporomandibular joint. When there is excessive cervical flexion or extension, the infrahyoid musculature is stretched, having direct effects on the larynx and throat.

When there is a cervical injury, the muscles of mastication became secondarily involved. This is because the jaw opens from the mandibular depressors and also by way of accessory as well as direct cervical musculature involvement. The jaw can open by posterior cervical muscles contracting, pulling the occipital area of the skull posteriorly, thus "opening" the skull when a jaw is displaced. The jaw reciprocally becomes secondarily involved as well as the masticatory musculature when there is a primary cervical pain, strain, or direct traumatic injury. In whiplash cases, it is well known that the temporomandibular joint is involved in both the acceleration as well as deceleration phases of injury-- with subsequent complications of joint hematoma, ligament and disc tears, displacement and sprain.

One major consideration for joint treatment in addition to various PT and pain control modalities should be consideration of a neuromuscular jaw repositioning splint appliance. These are laboratory processed, based on orthopedic plaster casts made of the maxillary and mandibular arches and an accurate jaw-to-jaw repositioning tansfer; the splint is inserted and balanced in the mouth fitting over the maxilla or mandible. Their purpose is to rebalance the neuromusculature to a more stress-free environment, allowing normal meniscus-disc placement, and to help generate soft tissue-ligament repair.

Neurologically, the trigeminal nerve nucleus extends down to the level below the bones to the cervical III level and has spill-over neurologic effects to the mid-cervicals. Also, the cervical sympathetic plexus and its associated ganglia extend forward to the jaw and as far as the lacrimal glands around the eye. Thus, we have spill-over symptoms into the face and jaw from primary cervical traumatic involvement. With these sensitive physiologic mechanisms, orthopedic craniocervical-mandibular therapies can often have dramatic effects on the patient's rehabilitation and overall health improvement.

With a patient having excessive forward head posture, the jaw is usually retruded. As repositioning of the jaw is done via splint therapy, the head adapts to a more neutral position supported with posture re-training and Physical and Manipulative Therapy. When axial repositioning is done, consideration of bite changes must be done or therapy may not last, and vice versa. The dentist

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and physical therapist must communicate well regarding the patient's course of mutual treatment.

A team approach to managing patients with TMJ disorders and craniofacial pain is essential if the maximum recovery is to be anticipated and affected.

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I have had the opportunity to teach with Dr. Smith at the Philadelphia College of Osteopathic Medicine for over eight years. I have been impressed with his forward thinking and his emphasis on the multi-disciplinary approach, understanding the interrelationships of the various structures of the body and receiving and treating temporomandibular dysfunction as a whole body phenomena.

For those interested in learning more about the latest advances in temporomandibular pain and dysfunction, Dr. Smith will be presenting:

The 1988 Orlando International TMJ Symposium
at the Grosvenor Resort
Walt Disney World Village
Lake Buena Vista, FL
March 27-13, 1988

The symposium will feature an internationally acclaimed multi-disciplinary facility. For more information, call Dr. Stephen Smith, D.M.D. at the Philadelphia College of Osteopathic Medicine at (215) 581-6500.

Three of the world's leading authorities on craniomandibular dysfunction have contributed their views and expertise to my "Therapeutic Insight" column recently. A clear and concise message is being presented in their own individual styles:

- The necessity of a multi-faceted approach.
- The importance of PT intervention.
- Evaluating and treating the fascial system via Myofascial Release.
- Evaluating and treating the whole body intellectually, emotionally and structurally.

Dr. Stephen Smith's findings that "87.5% of TMJ and are in need of appropriate therapeutic referral" is significant.

How many of you are receiving referrals from dentists and physicians treating TMJ dysfunction, for treatment of the TMJ and cervical areas?

How many of you are referring your patients with cervical dysfunction that are not responding to treatment to an appropriately trained dentist or physician for evaluation of possible TMJ involvement?

With a statistic of that magnitude it appears the cross referrals for a proper multi-disciplinary approach should occur the majority of the time.

Do they?

The high incidence of cervical involvement in TMJ dysfunction becomes clear when one understands the neurological effects of the trigeminal nerve in the mandibular and maxillary areas, the myofascial elements and facial structures continuing on down below the level of the pons to C3 and below.

Then we open up our focus and view the importance of the supporting structures of the only bilateral joint of our body, the TMJ mechanism. The pelvis must be balanced three dimensionally in space, otherwise imbalances will be reflected by changing the position of the shoulder girdle in space. This will have a profound effect on the myofascial spans in the posterior and anterior cervical areas and the supra and infrahyoid structures.

The cervical sympathetic plexus and ganglia are imbedded in the pre-cervical fascia. The fascia is capable of exerting enormous pressure on nerves, blood vessels, muscles and the osseous structures when restricted. So as Dr. Smith stated, many spill-over symptoms in the face and jaw can occur from dysfunction, restrictions and imbalances from below.

Compression of the occipital condyles due to local trauma, occlusal discrepancies, forward head position, restrictions of the myofascial tissues and/or dural tube from pelvic imbalance or by length discrepancies are very common.

In an upcoming issue of the *Physical Therapy Forum*, I will describe a very effective treatment for the occipital condylar area. I believe we should routinely evaluate and treat the occipital condyles and associated cervical structures with patients complaining of TMJ dysfunction and routinely evaluate and treat the cranio-mandibular apparatus with our patients complaining of cervical pain and dysfunction.

We in the Physical Therapy profession, working with the temporomandibular specialists, can provide consistently effective results in the relief of pain and the restoration of function.

John F. Barnes, PT

Please send your suggestions, case histories, and questions to John F. Barnes, PT, "Therapeutic Insight," c/o Physical Therapy Forum/Occupational Therapy Forum, 251 W. DeKalb Pike, Suite A-115, King of Prussia, PA 19406.