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## *e-Journal*

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## Original Articles

## Reprints & Abstracts

Mathematical modeling of the so called Allis test: A field study in orthopedic confusion

**Robert Cooperstein, Michael Haneline and Morgan Young**

*Chiropractic & Osteopathy* 2007, **15:3** doi:10.1186/1746-1340-15-3

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Abstract (provisional)

The complete article is available as a [provisional PDF](#). The fully formatted PDF and HTML versions are in production.

## Background

Chiropractors use a variety of supine and prone leg checking procedures. Some, including the Allis test, purport to distinguish anatomic from functional leg length inequality. Although the reliability and to a lesser extent the validity of some leg checking procedures has been assessed, little is known on the Allis test. The present study mathematically models the test under a variety of hypothetical clinical conditions. In our search for historical and clinical information on the Allis test, nomenclatural and procedural issues became apparent.

## Methods

The test is performed with the subject carefully positioned in the supine position, with the head, pelvis, and feet centered on the table. After an assessment for anatomic leg length inequality, the knees are flexed to approximately 90 degrees. The examiner then sights the short leg side knee sequentially from both the foot and side of the table, noting its relative locations: both its height from the table and Y axis position. The traditional interpretation of the Allis test is that a low knee identifies a short tibia and a cephalad knee a short femur. Assuming arbitrary lengths and a tibio/femoral ratio of 1/1.26, and a hip to foot distance that placed the knee near 90 degrees, we trigonometrically calculated changes in the location of the right knee that would result

from hypothetical reductions in tibial and femoral length. We also modeled changes in the tibio/femoral ratio that did not change overall leg length, and also a change in hip location.

## Results

The knee altitude diminishes with either femoral or tibial length reduction. The knee shifts cephalad when the femoral length is reduced, and caudally when the tibial length is reduced. Changes in the femur/tibia ratio also influence knee position, as does cephalad shifting of the hip.

## Conclusions

The original Allis (aka Galeazzi) test was developed to identify gross hip deformity in pediatric patients. The extension of this test to adults suspected of having anatomical leg length inequality is problematic, and needs refinement at the least. Our modeling questions whether this test can accurately identify LLI, let alone distinguish a short tibia from a short femur.

### **Reliability Analysis for Radiographic Measurement of Limb Length Discrepancy: Full-Length Standing Anteroposterior Radiograph Versus Scanogram.**

#### **Lower Limb**

Journal of Pediatric Orthopaedics. 27(1):46-50, January/February 2007.

*Sabharwal, Sanjeev MD \*; Zhao, Caixia MD \*; McKeon, John MD \*; Melaghari, Todd MD \*; Blacksin, Marcia MD +; Wenekor, Cornelia MD +*

#### **Abstract:**

Patients with limb length discrepancy (LLD) often have associated angular deformities requiring a standing full-length radiograph of the lower limb in addition to a scanogram. The purpose of our study was to determine the intraobserver and interobserver reliability of measuring LLD with both techniques, using computed radiography. The LLD was measured on 70 supine scanograms and standing anteroposterior radiographs of the lower extremity by 5 blinded observers on 2 separate occasions. Intraclass correlation coefficient (ICC) and mean absolute difference (in millimeters) was calculated to assess intraobserver and interobserver reliability and found to be excellent for both radiographic techniques. Intraobserver ICC and mean absolute difference was 0.975 to 0.995 and 1.5 to 2.6 mm for scanogram and 0.939 to 0.996 and 1.5 to 4.6 mm for the standing radiograph, respectively. Repeated measurements for both radiographic studies were within 5 mm of the first measurement greater than 90% and within 10 mm greater than 95% of times. Interobserver ICC and mean absolute difference was 0.979 and 2.6 mm for scanogram and 0.968 and 3.0 mm for the standing radiograph. The reliability was excellent irrespective of age, sex, and underlying diagnosis other than Blount disease, which had good reliability. A standing anteroposterior radiograph of the lower extremity should be the imaging modality of choice when evaluating patients with limb length inequality who may have angular deformities because it allows a comprehensive evaluation of the extremity and is as reliable as a scanogram for measuring LLD. This approach may decrease the radiation exposure and financial burden involved in assessing patients with unequal limb lengths.

#### Limited Success for Lumbar Epidural Steroid Injections in Stenosis

#### **Jacquelyn Beals, PhD**

February 16, 2007 (San Diego) — The efficacy of lumbar epidural steroid injection (LESI) in treating stenosis varies with the severity of the disease, calling into question the cost-effectiveness of using LESI in severe and

multiple-level moderate stenosis.

Frederick Parke Oldenburg, MD, from the Department of Orthopaedics, Case Western University School of Medicine and University Hospitals in Cleveland, Ohio, presented these findings here at the 2007 annual meeting of the American Academy of Orthopaedic Surgeons. Dr. Oldenburg said that a relationship between the severity of stenosis and the efficacy of LESI had not previously been established. In addition, the cost-effectiveness of LESI with respect to avoiding surgery was unknown.

Of 299 patients in this retrospective study, most had mild stenosis and no need for surgery.

Dr. Oldenburg told Medscape that the study also included patients who were not good operative candidates. "I think that [using LESI to treat] patients with mild stenosis who are poor operative candidates is a good option. Unfortunately, the chances of LESI being beneficial for patients with severe stenosis are far less."

The study classified patients as having mild, moderate, or severe stenosis by measuring the most stenotic level in MRIs of the spinal canal. Failure of LESI was defined by the patient's need for surgical decompression. To determine cost-effectiveness, the study examined the "rate at which surgery must be avoided" in patients who received LESI.

"LESI costs about \$2200, while lumbar decompression costs \$17,000," Dr. Oldenburg told the audience during his presentation. To be cost-effective, surgery must be avoided at least 13% of the time in patients treated with LESI.

The average time from LESI until a patient needed surgical decompression was 1.4 months in severe stenosis, 4.7 months in moderate stenosis, and 51.3 months in mild stenosis. The failure rate is higher when stenosis is present at multiple levels. The study found that LESI is cost-effective only for the group with mild stenosis.

Although he believes that LESI is not cost-effective for stenosis, Dr. Oldenburg often still recommends LESI. He told Medscape, "The patient needs to feel that they have exhausted all nonoperative options before going on to something more involved and invasive." However, both patient and physician must be aware that LESI has very limited long-term success, especially for severe or multiple-level moderate stenosis, he said.

Tony Tannoury, MD, from the Department of Orthopaedic Surgery at Boston Medical Center, and assistant professor of orthopaedic surgery at Boston University School of Medicine in Massachusetts, who attended the presentation, said he thought that all stenosis patients could benefit from epidural steroid injections. He told Medscape that a "very elegant study" presented last year at AAOS showed no correlation between the efficacy of LESI and the degree of stenosis. "It makes sense that patients with severe stenosis most likely will need surgery," he said. "But I still try to give them a trial injection. It's unpredictable who it is or is not going to work on."

Dr. Tannoury described the development of stenosis. "We know that stenosis is in the making for 40 or 50 years, but a patient develops the pain over 6 weeks or 6 months. The goal is not to take a patient back 40 years — that's what decompression surgery does. But LESI can take the patient back a week or two prior to when the symptoms started. That's the purpose of the injection."

Dr. Oldenburg disclosed no relevant financial relationships.

## Case History

### Clinical Case Report

**Title:**

Iatrogenic trigeminal neuropathy with resultant atypical facial fasciculation of the zygomaticomandibularis: chiropractic and dental co-management.

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**CASE REPORT:**

**Demographics:**

Age: 36 year-old  
Gender: female  
Height: 5' 10"  
Weight: 260#  
Occupation: chiropractic student

**History Information:**

**Chief Complaint:**

The patient sought care for a continuous fasciculation (at a frequency 300 -500 times per minute) of one of the muscles of mastication, later identified specifically as the *zygomaticomandibularis*.

**Date of Onset:**

August 15, 1995 and September 3, 1995

**Mode/mechanism of Onset:**

Three weeks after an initial forceful blunt trauma to the left TMJ, she yawned and experienced an acute episode of an opening anterior discal dislocation. More than 90 minutes passed before a reduction was attempted. In the process of reducing the joint lock, further trauma may have occurred within the TMJ. This produced an unknown neurological problem; specifically jaw tremors or fasciculations.

**Location of Pain:**

Unlike other TMD syndromes she rarely experienced any specific pain hence there were no pain descriptions, radiations, VAS documentation etc. The most significant issue was the fasciculations.

**Frequency of Symptoms:**

Immediately post reduction a jaw tremor or fasciculation began and had persisted virtually uninterrupted (24 hours per day, 7 days a week for more than 3 years) barring temporary treatment procedures (specific chiropractic adjustment and local anesthetics) to shut it down. The frequency of the tremors remained the same although the amplitude increased and decreased over time.

**Progression of Symptoms:**

She stated she was able to localize a 'jack-hammering effect' in her face, bilaterally, particularly under the zygomatic arch. She stated that these tremors continued during sleep (as was verified by observers). Periodically the patient would experience lateral side-to-side head movements as well that would at times

spread to involve the others parts of the body including both lower extremities. She also noted that vocalization was frequently affected and/or almost incomprehensible.

#### Family History:

Her family history did not reveal any evidence of neurological dysfunction, particularly fasciculation, tremor or abnormal involuntary movements.

#### Occupational History:

She had previously worked as an elementary school teacher.

#### Lifestyle Habits:

She did not drink or smoke. She had never been hospitalized nor had prior surgeries. She had taken no regularly prescribed medications prior to this trauma.

#### **Physical Examination:**

If she were examined with the tremors in 'shutdown mode', the following was noted on one occasion.

She was alert, oriented, and had with normal blood pressure (122/80) with a pulse rate of 102. Stance and gait were normal and the Romberg test was negative. Tandem gait was performed well. Cranial nerve examination revealed no abnormalities. The optic discs were well visualized and appeared normal. Motor examination revealed normal muscle bulk and tone throughout. Stretch reflexes were generally 2+ symmetrically throughout and the plantar responses were flexor bilaterally. Sensory examination revealed no abnormality to pin prick, touch and vibration. Finger-to-nose testing was done well and alternative motions rates were normal bilaterally.

When the tremors were in 'active mode', the following changes were noted.

There was an 8 cycle per second vertical mandibular tremor that was persistently present. At the same time, there was a rapid alternating side-to-side head movement at about two (2) cycles per second. A voice tremor was heard when attempting to hold a long note. The speech was characterized by a severe stuttering with an inability to completely verbalize a single word. At other times, the speech appeared normal. When the feet were suspended from an examining table, they swung back and forth rhythmically, alternately moving in the opposite direction from one another.

#### **Treatment:**

The patient was assessed over the course of almost 3 years by a total of 55 health care professionals including acupuncturists, chiropractors, dental surgeons, dentists, EENT specialists, internists, massage therapists, naturopaths, neurologists, oral surgeons, orthodontists, psychologists, radiologists and speech pathologists.

Since the initial presentation, she had received the following treatments and/or assessments: massage therapy to the muscles of mastication; physiotherapy such as ultrasound, electric muscle stimulation, Russian stimulation, ice and moist heat; electrical and needle acupuncture; proprioceptive neuromuscular facilitation exercises to the muscles; trigger point therapy; specific chiropractic adjustments to the TMJ, cervical and thoracic spine; herbal supplements; over the counter NSAID's; Medications: Naprosyn, Klonopin, Tegretol, Neurontin, Baclofen; iontophoresis; oxygen therapy 6 l/min; visual and auditory exercises; 10 dental splints/appliances of varying sizes and material (acrylic / rubber); orthodontic brackets (12 in total) and her mouth was wired shut for 10 weeks with 24 gauge wire; 5 series of cervical and TMJ x-rays, full spine x-rays, 2 sets of panoramic and 1 periapical set of dental x-rays, pulp testing of each tooth; axiographs of the TMJ; 2 full EMG studies of the muscles of mastication; TMJ tomograms; TMJ MRI's and skull cervical MRI's; video fluoroscopy of the cervical spine; cranial doppler studies; auditory and visual evoke potentials; blood Studies –

Biochem Profile, CBC, thyroid function; urinalysis; superficial and profound analgesia with xylocaine, carbaine, mercaine; radio frequency thermoneurolysis. The only treatments that had been successful in stopping the fasciculation for more than a few hours were a specific chiropractic adjustment, anesthetic injections and radiofrequency thermoneurolysis (lesioning) procedures.

It has been suggested that other procedures could have been attempted over the course of treatment. The following is a brief indication of the rationale and/or results: herbal supplements produced no change; the medications given (which were directed at CNS suppression) appeared to be ineffective; physiotherapy (electric muscle stimulation and Russian stimulation) actually intensified the fasciculations whereas the iontophoresis seemed to aggravate the various 'levels' of the tremors; oxygen hopefully strengthened the hypoxia in the cell membrane fragility and auditory/visual tests helped to stimulate the pathways but follow-up tests were inconclusive; electrical acupuncture seemed to produce some 'sedative' effects; dental splints seemed to help initially on virtually each occasion, but the fasciculation seemed to re-route around the splint and the patient would vibrate with the splints in or out; orthodontic braces with wiring held her jaw in a retrusive position and seemed to help but the fasciculations still did not cease. Eventually even the strongest gauge wires would break, the brackets loosened her teeth and the subsequent motion started to reposition the teeth.

It was only through trial and error that it was discovered that holding the patient's jaw in a particular position (posterior **seeding**) could cause a temporary cessation in the fasciculations. This was believed to be due to minimizing the stretch on the muscle stretch receptor fibers. Since this was both impractical and physically demanding to do, attempts were made to duplicate the effects that this pressure and/or traction would have provided. The adjustive procedure was also somewhat non-traditional and it not normally utilized or recommended for TMD. Through palpation of the TMJ, we determined the relative positioning of the condyloid process compared to the articular eminence of the temporal bone. The chiropractic adjustments were along this line of correction to effect the necessary change. The effects of the adjustments were only able to temporarily shutdown the fasciculations but for only a limited time (maximum was 96 hours).

Specific chiropractic adjustments allowed for the activities of normal living, as much as was possible. The patient was placed in a seated position with the buttocks as far backwards as possible. The feet were placed flat on the floor with the heels extending outward; the hands in the lap with the palms up to help relax the cervical/shoulder musculature. The doctor stood behind the patient favoring the right side. The contact hand was the right hand. The contact point was the inferior aspect of the thenar eminence of the right hand with elbow pointing inferiorly to the patient's chest. The segmental contact point was the inferior aspect of the mandible approximately 3 cm lateral to the right of midline of the chin, stabilizing with the left hand. The stabilization point was the inferior aspect of the thenar eminence of the left hand with elbow pointing inferiorly to the patient's chest with fingers directed cephalically with 2-4<sup>th</sup> digit finger pads covering left TMJ. The segmental stabilization point was the inferior aspect of the mandible approximately 3 cm lateral to the left of midline of the chin.

The doctor placed the finger tips of the stabilizing left hand on the patient's TMJ. The left thenar was placed on the inferior aspect of the mandible where a slight anterior to posterior pressure was applied on the chin to straighten the central incisors of the teeth to midline. The contact hand was placed on the right inferior aspect of the mandible. With the jaw opened approximately 35 mm (1.75") and the patient resisted the inferior to superior pressure with an applied thrust towards the left TMJ, i.e. the appropriate position for the mandibular seating. The thrust was anterior to posterior, inferior to superior and lateral to medial (right to left).

The patient had received numerous injections of local anesthetics, via nerve block, which were repetitively given to try to find the correct injection site. In a nerve block, anesthetic is injected into the extraneural or paraneural spaces, providing complete anesthesia in the region supplied by that nerve, distal to the site of injection. Anesthesia begins with sympathetic blockade. Patients then experience a loss of pain, temperature sensation, proprioception, and touch and pressure sensation; motor paralysis is the final stage. The modern anesthetics can prolong their action when given with epinephrine (a vasoconstrictor). It is widely accepted that there is no absolute contraindication to the administration of anesthetic agents. There however exist some conditions where it is not advisable to give the full concentration of the drug. Hypertension and allergic reaction are conditions where epinephrine is not included in the anesthetic solution. The patient had been assessed and

these complications were ruled out prior to the prolonged use of these anesthetics. Marcaine was chosen because of its longer effects especially when combined with the epinephrine. Marcaine was given in the vicinity of the zygomatic arch (between the second and third molar) to diffuse cephalad towards the maxillary sinus. Once the anesthetic effects were manifested, the shutdown would last 6-8 hours, depending upon the strength and frequency of the injections.

The final reparative process was the radiofrequency thermoneurolysis procedure. The radiofrequency thermoneurolysis is employed in the most recalcitrant cases. It was intended to be a 'destruction or dissolution of nerve tissue, done as a permanent measure for the interruption of impulses at a motor point'. This was accomplished via a cauterization process of nerve endings and resulted in permanent scarring and/or neuroma development. Generally the neurolysis procedure is not normally done on a neuromuscular junction, especially to a muscle of mastication. The procedure is normally done to alleviate pain but in this case the patient did not experience significant pain; it was the motor component only that required cauterization. Although the patient required 3 neurolysis procedures (suspected due to regeneration of the nerve endings around the cauterization site), she has remained fasciculation free over the past 7 years.

### **Etiology:**

The most significant challenges were to accurately identify the source of the problem in a patient with bizarre symptoms in conceivably "unknown" diagnostic territory, seek professionals to coordinate their efforts to coordinate the development of a plan or management protocol to reduce, eliminate and/or repair the problem, and to utilize approaches and/or somewhat unorthodox methods to reach the desired conclusion. There had been controversy, as recent as 1995, dealing with a previously unidentified muscle of mastication, isolated utilizing the Visible Man Project. It was given the name *zygomaticomandibularis* (previously believed to be part of the medial belly of the temporalis) because it originates from the maxillary surface of the sphenoid bone and inserts on the temporal crest (internal oblique line) of the mandible. The vascularization and innervation of the muscle still remains completely delineated. There was neither clinical literature nor empirical data on signs and symptoms of how an injury to the muscle could manifest that the way it did. With the new discovery of the muscle and with only recent verification, finding a means that could isolate some of the effects of trauma to this muscle confirms that it could act independently from the temporalis for example.

The etiology of the fasciculation was believed to be attributed as a post traumatic trigeminal neuropathy involving the motor root of the mandibular division to the zygomaticomandibularis muscle. It was suspected to be an avulsion of the neurolemma from the neuromuscular junction of the muscle that precipitated the uncontrollable fasciculation activity. As the stretch receptors were stimulated, via opening the mouth more than 25 mm (as required with eating, vocalization, being chilled, yawning etc), there was a firing at the neuromuscular junction. The normal inhibitory or resting impulses were not received at the neuron level and the effects of the inhibition did not occur.

### **Pathophysiology:**

There are various causes of jaw fasciculations. Some symptoms suggestive of a neurological cause of fasciculations include wasting of muscle tissue, weakness, paresthesia etc. Neurological illnesses where fasciculations are seen include chronic denervation of muscle due to disc compression of nerve exiting the spinal cord, amyotrophic lateral sclerosis (ALS or Lou Gehrig's Disease), spinal muscular atrophy, muscular dystrophy or some form of myopathy. In this particular case there was no asymmetrical muscle weakness, atrophy nor pain.

The customary medical approach to fasciculation treatments focuses on medications that intend to reduce the symptoms. The customary prescriptions include Klonopin (clonazepam, a type of tranquilizer that produces CNS depression) and Tegretol (carbamazepine, an anticonvulsant that decreases CNS impulses associated with pain). Klonopin is useful alone or an adjunct in the treatment of akinetic and myoclonic seizures. The patient completed the prescribed drug regime for 3-4 months as well as had the dosage varied to attempt to reestablish

the efficacy. Neurontin is indicated for the management of neuralgia. Baclofen is useful for the alleviation of signs and symptoms of spasticity (clonus and muscular rigidity). Naprosyn (Naproxen) is indicated for the relief of mild to moderate pain

### **Conclusions:**

Although numerous approaches were attempted, the only treatments that had any specific effect on the fasciculation frequency and intensity were a non-traditional chiropractic adjustment to the temporomandibular joint (TMJ), nerve blocks via anesthetic injections and a subsequent experimental dental procedure involving radio frequency thermoneurolysis (lesioning).

It is customary to recommend a more gentle technique for TMD (such as Activator - generally considered appropriate for the conservative treatment of adhered anteriorly dislocated disc). In this particular case, however, the Activator was minimally effective. The utilization of a more forceful anterior-posterior seating of the mandibular condyle into the articular fossa was necessary.

A nerve block anesthesia was used directly adjacent to the neuromuscular junction to supply a more effective response. Epinephrine was added to prolong the duration of the anesthesia.

The radiofrequency thermoneurolysis procedure involved a radiofrequency current (500 MHz). The radiofrequency current, consisting of alternating current electricity, was guided directly to the peripheral nerve supply to the zygomaticomandibularis muscle via a catheter. This had the effect of selectively destroying the small nerve fibers via cauterization. Generally this procedure was deemed as a last resort because of the amount of tissue cauterization. However, it was a thermoneurolysis procedure that was conclusive in terminating the fasciculations.

There was usefulness for chiropractic where it is not expected in that it was not anticipated when the patient came through that door that I could find any way to help the condition. The adjustment would make it possible for the patient to be in shutdown mode, somewhat while the dentist did examinations, molds, injections, etc. With the adjustments it also allowed health professionals to see her pre and post (both phases) and its effects could be immediately monitored. The dental analgesics were 'too long' to be of benefit for assessment. The adjustment was quick and easy. It could be applied to many different environments and stages of tremors and it was generally believed to be less traumatic to the tissues than continued injections of analgesics, even though the author was aware of further microtrauma to the retrodiscal tissue and capsular ligaments and muscle fibrils. The patient response was monitored relatively easy in that there was complete cessation of fasciculations when effectively or successfully applied. Otherwise there was the full-blown tremor.

To the recollection of the author, there have been no further occurrences and/or exacerbations in the fasciculations since the third neurolysis procedure. The patient has continued to receive chiropractic and 'normal' dental care without complications since that time.

This study could be considered important, at least at this point in time, since only theoretical details were known about the 'new' muscles; the identity had be confirmed by secondary studies, but physiological function and clinical significant wasn't known or at least delineated. This helped to enhance our understanding in that the neurolysis procedure was experimental at best and had never been done to a muscle of mastication like this. As recent as August 2005 it was still considered 'experimental' by the FDA because it had not been approved for a specific ICD-9 code and therefore payment for the services would not be accepted by any insurance carriers.

It is not feasible to suspect that injuries to this particular muscle would create the same clinical picture in other patients. This paper is merely to describe a case with bizarre manifestations that are believed attributable to the zygomaticomandibularis. It represented the challenges in having no prior guidelines upon which to proceed to care for a patient with an unidentifiable problem. Since more details about this muscle are still under review and research it is difficult to speculate further.

Although there were numerous recommendations for a psychological component, the patient was assessed for a behavior component to her problem beyond a pronounced dependency upon her caregivers. This was understandable considering the nature and duration of the disability and the dramatic changes once care was given.



There have been various studies that have found that chiropractic can be effective in its ability to assist the various TMD symptomatology via correcting for biomechanical aberrancies or postural distortions. However, it is generally accepted that neither dental occlusal problems nor chronic TMJ derangements can be changed by chiropractic care alone. The purpose this case report is to describe a case involving the merits of interdisciplinary case management of a patient with bizarre, continuous atypical facial fasciculations. It was the cooperative and integrative approach that provided the setting for the delineation and subsequent treatments for this particular case presentation.

## REFERENCES:

- Alcantara J, Plaughter G, Klemp DD, Salem C; Chiropractic care of a patient with temporomandibular disorder and atlas subluxation, *Journal of Manipulative and Physiological Therapeutics* - January 2002 (Vol. 25, Issue 1, Pages 63-70)
- Author not available, Dorland's Illustrated Medical Dictionary, The MerckSource, Merck & Co., Inc, A.D.A.M. Encyclopedia
- Brown CR. Ernest syndrome: Insertion tendinosis of the stylomandibular ligament. *Pract Periodontics Aesthet Dent*. 1996 volume 8(8) page 762.
- Chinappi, AS, Getzoff H; The dental-chiropractic cotreatment of structural disorders of the jaw and temporomandibular joint dysfunction. *Journal of Manipulative Physiological Therapeutics*, September 1998, volume 18 (7) pages 476-481
- Cole, SV, Smith, JE: Frequency of occurrence of zygomaticomandibularis muscle: a recently described structure, *Journal of Craniomandibular Practice*, October 1997; volume 15(4) pages 310-313
- DeVocht JW, Long CR, Zeitler DL, Schaeffer W. Chiropractic treatment of temporomandibular disorders using the activator adjusting instrument: a prospective case series. *Journal of Manipulative and Physiological Therapeutics* 2003 volume 26, pages 421-425.
- Dunn, G.F., Hack, G.D., Robbins W.L., Koritzer, R.T.: Anatomical Observation of a Craniomandibular Muscle Originating from the Skull Base: The Zygomaticomandibularis, *Journal of Craniomandibular Practice*, April 1996; volume 14(2) pages 97-103
- DuPont JS Jr.: Panoramic imaging of the stylohyoid complex in patients with suspected Ernest or Eagle's syndrome. *Journal of Craniomandibular Practice*, 1998 volume 16(1) pages 60-63.
- Gillespie, B: Assessment and treatment of TMJ muscles, fascia, ligaments and associated structures, *Journal of Cranio-Mandibular Practice* 1990 volume 83(6) pages 51-54
- Gordon, Claire: *Diagnosis and co-management of temporomandibular joint disorders: a case study*, *The British Journal of Chiropractic*, April 1999, Volume 3 (2) pages 40-43**
- Greenaum, MG., Young, MA., Frank, JM : Attenuation of facial muscle spasticity with intramuscular neurolysis, *Archives Physical Medicine & Rehabilitation*, February 1993 volume 74(2); pages 217-219
- Kerr, J., Ratiu, P., Sellberg M.: Volume Rendering of the Visible Human Data for an Anatomical Virtual Environment, *Health Care in the Information Age*. (eds) S. Weghorst, H. Sieburg, K. Morgan, IOS Press Washington, D.C., 1996, pages 352-370

Myers, LJ: Newly described muscle attachments to the anterior head of the articular disk of the temporomandibular joint; *Journal of the American Dental Association* September 1988, volume 117(3) pages 437-439

Saghafi, D., Curl, DD: Chiropractic manipulation of anteriorly displaced temporomandibular disc with adhesion. *Journal of Manipulative Physiological Therapeutics*, February 1995, volume 18 (2), pages 98-104,

Shankland, WE II: Temporomandibular disorders: standard treatment options, *General Dentistry*, July/August 2004, pages 349-356

Shankland, WE II, Negulesco, JA, O'Brian: The "pre-anterior" belly of the temporalis muscle: a preliminary study of a newly described muscle, *Journal of Craniomandibular Practice*, April 1996 volume 14(2): pages 106-112

Shankland WE II: Ernest syndrome as a consequence of stylomandibular ligament injury: A report of 68 patients. *Journal of Prosthetic Dentistry*, 1987 volume 57(4) pages 501-506.

Wilk SJ. Surgical management of refractory craniomandibular pain using radiofrequency thermolysis: A report of thirty patients. *Journal of Craniomandibular Practice*, 1994 volume 12(2) pages 93-99.

## Clinical Pearl

## Review of the Literature

**By Warren Jahn**

### ***Strength and Endurance Exercises Decrease Chronic Neck Pain***

December 15, 2006 — An effective dose of specific strength and endurance exercises decreases chronic neck pain in female office workers, according to the results of a randomized trial reported in the December issue of *Medicine & Science in Sports & Exercise*. *Med Sci Sports Exerc.* 2006;38:2068-2074

"Chronic neck pain, a reduced range of motion of the cervical spine, and weakened neck-muscle force are more common among women than men, and they are related to impairments, functional limitations, and disability," write Riku Nikander, of the UKK Institute for Health Promotion Research in Tampere, Finland, and colleagues. "The purpose of this study was to examine the dose-response relationship of specific strength- and endurance-training regimes for the cervical muscles that have been shown to be effective among women with chronic neck pain and disability."

Investigators randomized 180 female office workers with chronic neck pain and disability to 1 of 3 groups: strength training, endurance training, or control. Age range was 25 to 53 years. Both training groups participated in a 12-day rehabilitation period, during which they received instructions for specific exercises from an experienced physical therapist. They were then instructed to perform specific exercises at home for 12 months. A training diary and a 1-month all-time recall questionnaire were used to measure physical activity, and all activities were converted into metabolic equivalents (METs).

An effective training dose for decreasing neck pain was more than 8.75 MET-hours per week of specific neck, shoulder, and upper extremity training. One MET-hour of training per week was associated with a 0.8-mm decrease in neck pain on a visual analog scale and a 0.5-mm decrease on a disability index. Both strength and

endurance training were associated with decreased perceived neck pain and disability, and these decreases correlated positively with the amount of specific training.

Study limitations include possible errors in the estimation of exercise intensity.

"This study revealed that the described specific exercise protocols were associated with decreases in chronic neck pain and disability," the authors write. "The effective dose of training was feasible and safe to perform among female office workers."

**Editorial comments:** Neck pain and low back pain constitute the most common musculoskeletal complaints in a chiropractic orthopedist's office. Chronic neck pain is more common in women than in men and is frequently the result of multiple causes, including physical strain and psychosocial stress. The duration and intensity of training correlated positively with improved study outcomes. This study found the the mean visual analog scale scores in the strength-training, endurance-training, and control groups as 18, 23, and 42, respectively. The mean respective disability scores were 12, 16, and 26.

Strength and endurance training were equally beneficial in terms of their effect on neck pain and disability. Although it has been demonstrated that high-intensity strength training improves chronic neck pain, the record of less intensive training is mixed. Participants with the highest levels of neck pain at baseline benefited the most from either active intervention.

*Cervical spinal cord neurapraxia in the setting of Klippel–Feil anomaly: a diagnostic and therapeutic challenge*

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*Abstract*

**Study design:**

Case report.

**Setting:**

Temple University Children's Medical Center in USA.

**Objectives:**

To report a patient whose recurrent and transient episodes of quadriplegia mimicked cervical cord neurapraxia. Cervical spine neuroimaging revealed congenital intersegmental fusion of C5 through C7 (consistent with Klippel–Feil anomaly), corresponding abnormal spinal cord signals on T2-weighted images and enhancing

focal lesion opposite the C4 vertebral body. A posterior cervical decompression at C4–C5 and lateral mass fixation was performed, and the episodic quadriplegia has not recurred.

**Conclusion:**

Understanding of the biomechanics of Klippel–Feil anomaly may facilitate prompt referral for surgical management and avoidance of permanent disability.

**Editorial comments:** Klippel–Feil anomaly (blocked vertebrae) may be a potential risk for neurological deficit and advanced imaging may be necessary prior to manipulative techniques. The chiropractic orthopedist should consider advanced imaging (CT scan for bony evaluation) and serial neurological monitoring as part of their treatment plan with similar radiographic findings and/or neurological deficit.

## Current Events

### President’s Message

American College of Chiropractic Orthopedists (ACCO Spring Convention will be held at the Wigwam Resort in Phoenix, Arizona April 27-29, 2007. This is a call for papers to be presented. Details are on the website.

### Call for Graduate Instructors/Professors

Chiropractic Orthopedics is looking for interested doctors to teach in an advanced degree program. Master of Science: Physical Medicine and Rehabilitation (MSc: PM&R)

Instructors/professors from different specialties and disciplines are also asked to apply. If you have any specific area of expertise please indicate the area(s).

Please send a copy of your curriculum vitae and teaching portfolio to:

Dr. Jerry Wildenauer  
Executive Director  
Academy of Chiropractic Orthopedists  
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## Attribution

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