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The Editor's Desk

Shawn M. Neff, DC, MAS, FACO
Editor-in-Chief

Welcome to the March 2018 issue of the Journal of the Academy of Chiropractic Orthopedists. Spring is slowly arriving and bringing new life and new beginnings. This issue marks the beginning of the 15th year of the journal.



The picture this month is of a cane one of my patients carved. He was kind enough to make a trip over to the hospital to share his talent with me. We at the journal and we your colleagues in the specialty as well as our patients rely on you sharing your talent with us in the form of original research and case reports. If you have an idea but need help bringing it to fruition, contact me to be paired with an experienced chiropractic researcher to coauthor.

We continue to work to remedy the issues we are having with the archives of the Journal. If you have copies of any of the archived journals which are currently corrupted, please contact me at editor@dcorthoacademy.org.

We hope that 2018 is the best year ever not only for the journal but for all of you in your personal and professional lives.

I hope you all enjoy this issue.

Sincerely,

-Shawn

Management of Low Back and Hip Pain with Leg Weakness – Choosing the Proper Technique: A Case Report

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Abstract

Objective: The purpose of this study is to report the management of a patient with insidious onset of low back pain and bilateral iliofemoral pain. There was no history of trauma reported or evidence of trauma upon examination.

Clinical Features: A 26-year-old male presented to the clinic with low back pain, bilateral iliofemoral pain, bilateral thigh weakness and pain, bilateral groin pain, and urinary incontinence.

Intervention and Outcome: The patient was treated with two separate trials of chiropractic care resulting in 20 visits over the course of 12 weeks. The chiropractic care consisted of Sacro-Occipital Technique (SOT) treatment applied to the pelvic region, but traditional spinal manipulation was also utilized during one visit. In addition to chiropractic care, the patient also participated in exercise rehabilitation for a total of 7 visits and 4 sessions of kinesiology taping to the lumbar spine.

Conclusion: This study demonstrates a favorable response to SOT of the pelvis as an alternative to traditional techniques of spinal manipulation more commonly seen in chiropractic care. It also reveals the importance of coupling spinal care with exercise rehabilitation.

Background

There are multiple ways to perform spinal manipulation. In chiropractic, the different variations are known as “techniques”. Estimates vary regarding the number of chiropractic techniques employed around the world. In a survey performed by both Australian Chiropractic Associations involving 280 doctors of chiropractic, the most common techniques used in practice were diversified, activator, flexion-distraction, and soft-tissue therapies.¹ Three techniques for the low back that are the most widely studied in research include side-posture high velocity low amplitude (HVLA) manipulation, flexion-distraction, and general mobilization.² In general, traditional chiropractic treatment focuses on manual manipulation of the spine. Sacro-Occipital Technique (SOT), another chiropractic technique, was developed in the 1920s by Dr. Major Bertrand de Jarnette³ after appreciating a reduction in pain while lying on a traditional chiropractic table with certain elements elevated. He reasoned that by applying specific biomechanical forces to the pelvis, one could resolve pelvic asymmetry. SOT differs from traditional chiropractic techniques because it does not involve manual manipulation, providing a less invasive approach to the treatment of low back pain. De Jarnette performed many experiments to identify the optimal instrument for application of SOT and ultimately selected wooden wedges, also known as “blocks”, that are to be positioned beneath the patient’s pelvis. In 1964, he published the results of his experimentation.³ SOT has since been taught at various chiropractic colleges. Several case studies have been published describing increased range of motion and improved pelvic biomechanics following utilization of SOT.⁴

It is estimated that low back pain affects 80% of people over the course of a lifetime.⁵ Due to the prevalence of this musculoskeletal complaint, research much be done to determine how best to individualize treatment for each patient. Per the American College of Physicians, spinal manipulation was strongly recommended as a form of non-pharmacologic treatment for acute, subacute, and chronic low back pain.⁶ Classification of the most common chiropractic techniques regarding varying patient presentation of low back pain is essential in providing congruent evidence-based care to the estimated 700 million people world-wide affected by low back pain at any given moment.⁷

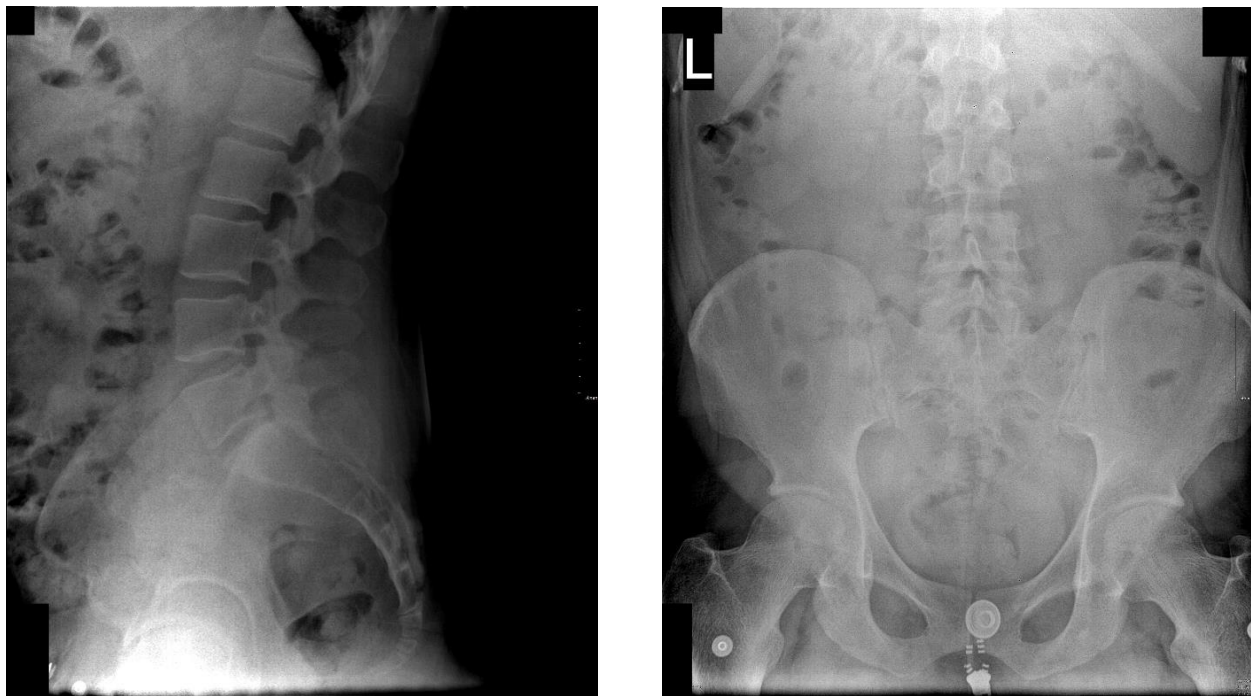
Case Presentation

A 26-year-old Asian-American male presented to a private practice clinic with chief complaints of iliofemoral pain, low back pain, lower extremity pain, foot pain, and thigh weakness, all presenting bilaterally. His symptoms began a year and a half prior to the initial appointment but had worsened over the past five months. It was then that he started to use a cane to assist with ambulation. Upon deeper questioning, the patient reported struggling with urinary incontinence that began at the start of this condition. With no known history of trauma, the patient attributed his symptoms to long hours of working on his feet at a restaurant job, rarely having a day off to

rest. The patient stated that the original pain was confined to his left iliofemoral joint but had recently begun to affect the contralateral side. In addition to the main complaints, he reported upper back pain as well as neck pain. On the Numeric Pain Rating Scale (NPRS), he rated his pain in both iliofemoral joints, low back, mid back, neck, bilateral feet, and bilateral thighs as an 8/10. The pain was temporarily relieved by massage, stretching, and ibuprofen but always returned, especially after long work days. The patient stated that the pain at the initial appointment was no different in character or intensity than it had been over the last five months. Via patient history intake, the patient reported difficulty sleeping, sitting in a chair for more than one hour, and prolonged car riding. He also reported experiencing numbness and tingling of the thighs, muscle and joint pain, and fatigue. The family medical, surgical and pharmacological histories were not pertinent to the treatment of this patient. The patient visited a primary care physician five months prior due to the exacerbation of the condition and was then diagnosed with piriformis syndrome. The patient also reported receiving several chiropractic treatments four months prior with minimal results.

Radiographic examination of the lumbar spine, both anterior-posterior and lateral lumbopelvic views were negative for serious pathology. The only finding present was facet tropism of L5/S1.

Figure 1: Radiographic Lumbar Series



The initial physical examination revealed a slightly elevated blood pressure of 134/99 mmHg with a pulse of 76 beats per minute. Grip strength was recorded at 110 lbs. on the left and 105 lbs. on the right. Significant hypertonicity and spasms were noted at the left trapezius and levator scapula, right thoracic erector spinae, and right gluteus medius and piriformis musculature. Thoracolumbar range of motion was measured using dual inclinometers. Thoracolumbar flexion was minimally decreased at 55 out of 60 degrees but provoked sharp left iliofemoral pain. Thoracolumbar extension was decreased at 17 out of 25 degrees but did not cause pain or discomfort at any location. Thoracolumbar right lateral flexion was decreased to 14 out of 25 degrees and caused sharp left iliofemoral pain. Thoracolumbar left rotation was within normal limits of 30 degrees but also provoked the left iliofemoral joint pain. All other thoracolumbar ranges of motion were non-provocative and were within normal limits. Restricted right sacro-iliac fluid motion was noted upon examination with exquisite tenderness on palpation. Palpation of the right lower posterior rib cage and right piriformis muscle provoked localized pain, as well. Muscle testing of the hip flexors, hip abductors, hip adductors, and knee flexors was a 3/5 on the right and 4/5 on the left. Muscle testing of the right lower extremity provoked right iliofemoral pain but muscle testing of the left lower extremity did not.

Both patellar and achilles deep tendon reflexes were rated 2+ bilaterally. Nachlas test was positive on the left for both thoracic and lumbar pain and negative on the right. The patient experienced difficulty bilaterally with both heel and toe walking but pain only on the left. Straight Leg Raise (SLR) was positive on the right with reproduction of low back and posterior thigh pain radiating to the heel; SLR was negative on the left. Patrick Test was positive on the left for iliofemoral pain and negative on the right. Prone Leg Extension Test was positive bilaterally for imbalanced muscle activation and caused severe pain in the left sacro-iliac joint while raising the left leg; however, the patient experienced greater difficulty elevating the right leg (without pain). Valsalva maneuver was negative for pain and discomfort.

Following this examination, the patient was diagnosed with bilateral L2-L4 radiculopathy, mechanical low back pain, sacro-iliac joint dysfunction, and muscle strain of the left hip flexor musculature.

Patient was referred for MRI evaluation. The MRI was negative and revealed a normal lumbar spine.

Figure 2: Magnetic resonance imaging of the lumbar spine



Management and Outcome

Management consisted of two trials of chiropractic care totaling 20 visits over the course of 12 weeks. After the initial visit, the patient was no longer using a cane and reported a 50% reduction in bilateral hip pain (4/10), left thigh pain and weakness (4/10), low back pain (4/10), and upper-mid back pain (4/10) as measured by NPRS. He endorsed a 12.5% reduction in right thigh pain. He also reported an 87% reduction in both neck and bilateral foot pain (2/10), as well as resolution of urinary incontinence. Chiropractic treatment included prone high velocity-low amplitude (HVLA) spinal manipulation of the thoracic spine, supine Diversified technique of the cervical spine, and passive SOT of the pelvis, a technique chosen due to the severity of the patient's pain in that area. Initially, the patient was seen for chiropractic treatment 2-3 times per week for 3 weeks. Re-evaluation was performed at the 8th visit. The second physical exam showed resolution of initial right thoracic erector spinae muscle hypertonicity and the pain

during palpation of the lower right posterior rib cage. The patient's blood pressure was 138/98 mmHg with a pulse of 64 beats per minute. The following orthopedic examinations remained positive for pain in the low back and/or hip area: Nachlas on the right, Ely on the right, Kemps on the right, and SLR on the right causing radicular symptoms down the right thigh and leg. SLR was positive on the left for low back pain only. The patient endorsed complete resolution of left lower extremity pain, left hip pain, and left lower extremity weakness. He rated his right lower extremity pain at 6/10, low back pain at 3-4/10, right hip pain at 6/10, neck pain at 1/10, and mid-back pain at 3/10 on the NPRS. The patient subjectively reported that standing and working had become easier since initiation of care, and that his gait had improved. He also reported feeling stronger, especially in the left leg, and endorsed better sleep.

At this point of care, a new chiropractic technique was chosen for the treatment of the low back and pelvis due to the improved but plateaued results in the low back and iliofemoral joints. For one visit, the HVLA drop table mechanism (Thompson technique) was utilized instead of SOT for the pelvis with instrument assisted manipulation (Activator instrumentation) utilized in the lumbar spine. The patient returned two days later having regressed to symptomatic baseline, rating his pain at 8/10 on the NPRS and endorsing a recurrence of bilateral lower extremity weakness. Patellar and achilles deep tendon reflexes were again performed and remained +2 bilaterally. The patient denied recurrence of urinary incontinence and denied any new issues with bowel function. After two additional visits with application of SOT, the patient reported 3/10 on NPRS in all areas and feeling "90% better." Pelvic SOT was continued throughout the remainder of the treatment plan. Upon resolution of the exacerbation, the patient was referred to an exercise rehabilitation specialist in the same private practice clinic for therapy involving lumbo-pelvic stabilizing exercises and stretching in addition to kinesiology taping.

Rehabilitation exercise sessions occurred once per week for 4 weeks followed by every other week for 8 weeks and included both strengthening exercises and stretches. The first phase of exercises included calf raises, donkey kicks, and standing hip abduction. The first phase of stretches included modified child's pose, runner's calf and achilles stretch, standing quadruped stretch, sitting figure 4 stretch, and the sitting hamstring stretch. After the second visit of exercise rehabilitation and two sessions of kinesiology taping of the lower back, the patient reported greater ease during exercises and less pressure on the low back during work hours. During phase two of exercise rehabilitation, new exercises and stretches were introduced including the cat/camel stretch, single leg bridges, ball squats, flutter kicks, air bicycles, crossed-leg piriformis stretch, side lunges, supine hip flexor stretch, and the knee hug stretch.

For the remaining 6 weeks, the patient was seen once per week. During the last three visits, drop table spinal manipulation of the left iliofemoral joint was also administered. By the end of this phase of care, the reported NPRS scores were as follows: 0/10 in bilateral legs and feet, 2/10 in bilateral iliofemoral joints, 1/10 in both the mid back and neck, and a 2/10 in the low back. Thoracolumbar flexion was decreased to 50/60 degrees and no longer provoked pain in the left

iliofemoral joint but merely affected tight bilateral hamstring and calf muscles. Thoracolumbar extension caused minor right iliofemoral pain and had increased to 19/25 degrees.

Thoracolumbar right lateral flexion greatly increased to 24/25 degrees and only produced mild thigh soreness. Thoracolumbar left lateral flexion was recorded at 20/25 degrees and produced mild leg soreness and slight low back pain. Thoracolumbar bilateral rotation produced no pain and were both within normal limits at 30/30 degrees. The patient's blood pressure decreased to 126/85 with a pulse of 60 beats per minute. Nachlas and Ely were negative bilaterally for pain. The patient's grip strength had increased to 125 lbs. on the left and 117 lbs. on the right. SLR was positive bilaterally for slight low back pain but no longer caused radicular symptoms. Kemps was positive bilaterally for minor low back pain. Prone leg extension was positive on the left for suboptimal muscle activation, but the patient continued to struggle to elevate the right leg more. Patellar and achilles deep tendon reflexes remained a +2 bilaterally. The patient reported NPRS scores of 2-3/10 in all previous areas. He also stated that riding in a car and sitting had also become better tolerated.

After his final visit of the second trial of care, he denied pain in any thoracolumbar range of motion. As of the time of publication, this patient continues to be seen every 2-3 weeks, as needed, for management of his low back and iliofemoral complaints, as well as his muscle weakness. He continues to perform his home exercises and stretches approximately 3-4 times per week while keeping a six-day work schedule where he is on his feet for 8 hours or more at a time.

Table 1

Range of motion exam results in degrees with reported pain exacerbation before and after treatment.

Range of Motion (Normal)	Initial Examination (Degrees)	Pain Present (Initial Exam)	Final Examination (Degrees)	Pain Present (Final Exam)
Thoracolumbar Flexion (60)	55	Left iliofemoral joint	61	None
Thoracolumbar Extension (25)	17	None	15	None
Thoracolumbar Right Lateral Flexion (25)	14	Left iliofemoral joint	22	None
Thoracolumbar Left Lateral Flexion (25)	25	None	23	None
Thoracolumbar Right Rotation (30)	30	None	30	None
Thoracolumbar Left Rotation (30)	30	Left iliofemoral joint	30	None

Discussion

This study demonstrates success in the management of low back pain and iliofemoral pain with concomitant bilateral lower extremity weakness. This course of treatment also resulted in resolution of long-lasting urinary incontinence after the initial visit. Due to bilateral leg weakness and urinary incontinence, imaging was necessary to rule out more serious pathology, such as a space occupying lesion. The MRI revealed no contraindications to spinal manipulation.

The urinary tract is controlled by a complex neurological relationship involving sympathetic and parasympathetic nerves of the autonomic nervous system.⁸ Nerves exiting from the thoracolumbar region of the spinal cord are associated with the sympathetic function of the urinary tract; parasympathetic and somatic innervation arise from the sacral segments of the spinal cord.⁹ This well-established concept of neuroanatomy provides a valid hypothesis as to how neurological interference or dysfunction at a particular spinal level could potentially cause associated visceral symptoms in a patient. There is, however, very limited research currently on the treatment of these symptoms with spinal manipulation.

Although this study produced many benefits for this patient, it is important to emphasize that further research is necessary to determine the validity of the treatment rendered. Until a larger body of evidence exists to suggest which chiropractic techniques should be provided for various patient presentations of low back pain, the results of this study may not be generalized to the overall population.

This case study suggests that not all chiropractic techniques are appropriate for all patients with low back pain. Chiropractors must be diligent and thorough during initial examination to determine the best course of treatment possible for each patient. Although other techniques, such as side posture HVLA, have been more thoroughly researched, it is important to identify which chiropractic techniques are more suitable for each patient being treated.

Limitations

Due to the uncontrolled nature of case report studies, this study had several limitations. Causation may not be determined in this study as it could, in comparison, from a randomized control trial. It is important to note that only NPRS, range of motion, and general patient subjective measures were the main identifying factors in determining patient outcomes. More objective measures, including a rated outcome assessment questionnaire such as the Back-Bournemouth Questionnaire, would have generated more validity and objective results in this study.

Consent

Written consent for this publication was obtained from the patient.

Competing Interests

The author declares no competing interests.

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Hand-arm Vibration and the Risk of Vascular and Neurological Diseases – A Systematic Review and Meta-analysis.

Tohr Nilsson, Jens Wahlstrom, Lage Burstrom

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JACO Editorial Reviewer: Steven G. Yeomans, DC, FACO

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Author's Abstract:

Background: Increased occurrence of Raynaud's phenomenon, neurosensory injury and carpal tunnel syndrome has been reported for more than 100 years in association with work with vibrating machines. The current risk prediction modelling (ISO-5349) for "Raynaud's phenomenon" is based on a few studies published 70 to 40 years ago. There are no corresponding risk prediction models for neurosensory injury or carpal tunnel syndrome, nor any systematic reviews comprising a statistical synthesis (meta-analysis) of the evidence.

Objectives: Our aim was to provide a systematic review of the literature on the association between Raynaud's phenomenon, neurosensory injuries and carpal tunnel syndrome and hand-arm vibration (HAV) exposure. Moreover the aim was to estimate the magnitude of such an association using meta-analysis.

Methods: This systematic review covers the scientific literature up to January 2016. The databases used for the literature search were PubMed and Science Direct. We found a total of 4,335 abstracts, which were read and whose validity was assessed according to pre-established criteria. 294 articles were examined in their entirety to determine whether each article met the inclusion criteria. The possible risk of bias was assessed for each article. 52 articles finally met the pre-established criteria for inclusion in the systematic review.

Results: The results show that workers who are exposed to HAV have an increased risk of vascular and neurological diseases compared to non-vibration exposed groups. The crude estimate of the risk increase is approximately 4 ± 5 fold. The estimated effect size (odds ratio) is 6.9 for the studies of Raynaud's phenomenon when including only the studies judged to have a low risk of bias. The corresponding risk of neurosensory injury is 7.4 and the equivalent of carpal tunnel syndrome is 2.9.

Conclusion: At equal exposures, neurosensory injury occurs with a 3-time factor shorter latency than Raynaud's phenomenon. Which is why preventive measures should address this vibration health hazard with greater attention.

Clinical Relevance:

JACO Editorial Summary:

- This article was written by authors from the Occupational and Environmental Medicine, Department of Public Health & Clinical Medicine, Umea University, Umea, Sweden.
- The purpose was to reevaluate the association between Raynaud's phenomenon, neurosensory injury and carpal tunnel syndrome (CTS) by providing a systematic literature review including risk of bias and, to estimate the risk exposure of vibratory tool use based on meta-analysis.
- Relevant literature published from 1945-2016 resulted in 4335 abstracts, 294 articles, with 52 making the final selection as only those including relative risk (odds ratio) were included. This was further reduced to 24 articles included to complete the meta-analysis portion of the study.
- Hand-arm-vibration syndrome (HAVS) is the internationally acknowledged condition describing the symptom complex that occurs to the peripheral neurological, vascular and musculoskeletal systems when prolonged, extensive power tool vibration exposure occurs in manual work environments.
- The vascular component of HAVS includes vasospasm in the digital capillaries (causing "white finger"/Raynaud's Phenomenon).
- The neurological component includes both a diffuse peripheral neurosensory injury and median nerve entrapment at the wrist (causing CTS)
- Skeletal injuries in HAVS include osteoarthritis and development of muscular dysfunction (such as tendonopathies, tenosynovitis, fibrosis/Duputren's contracture).
- The vascular and nerve manifestations in HAVS can occur together or separately.
- Workers who are exposed to HAV have a crude estimate of 4-5 fold increased risk of developing vascular and/or neurological disease.
- The estimated effect size (odds ratio) of 6.9 for Raynaud's phenomenon, 7.4 for neurosensory injury, and 2.9 for CTS when utilizing only the low risk of bias studies (but the number of CTS studies were few making the risk estimate for CTS less precise/more sensitive to bias).
- Comparing and contrasting high vs. low exposure to vibration groups resulted in a pooled risk estimate that varies between 2.5 and 5 for both Raynaud's phenomenon and neurosensory injury. There were too few studies found to calculate this for CTS.

- Possible outcome bias included shifts or changes in diagnostic approaches used in early vs. more recent studies as early studies included collectively many “sub-categories” that were reported in later studies (like large vs. small fibre neuropathy and entrapment syndromes like CTS).
- Also, between 1945 and 2016, testing protocols changed (lab tests, electro-diagnostic tests and various cold provocation tests are examples) as well as diagnostic precision. This may be why earlier studies found more vascular injuries vs. a shift to more nerve injuries found in the more recent studies.
- Further bias regarding the effect size was noted between the studies determined to have low vs. high risk of bias. The corresponding effect size for Raynaud’s phenomenon was 6.8 vs. 3.6, and for neuro-sensory impairment 7.8 vs. 3.3, respectively.
- Possible exposure bias (how long the person was exposed to vibration) is an issue as well, as differences in defining the degree of exposure was not consistent between the studies reviewed.
- Risk of developing HAVS is also affected by co-morbidities (other concurrent health conditions) as well as medication effects (such as BP meds). Interactions between different diseases/comorbidities, medication effects as well as sleep, fitness and age-related factors are currently lacking in these studies.
- With all the potential for bias described above, it remains clear that workers exposed to vibration/HAV have an increased risk of developing vascular and neurological diseases compared to non-vibration-exposed groups.
- At equal exposures, neurosensory injury occurs with a 3-time factor shorter latency than Raynaud’s phenomenon.
- More preventive measures are needed to aggressively address the tool vibration health hazard.

Summary:

This study describes the history of HAVS, compares and contrasts the early from the later studies (1945-2016), reports odds ratios using both the studies with low risk of bias only vs. those that have high risk of bias and, discuss in great detail the potential for other biases that should be considered. This high level of transparency is commended and appreciated. In the end, it remains clear that prevention must be aggressively addressed as it is key to minimizing the risk of developing neurological and/or vascular injury caused by tool-induced vibration exposure.

Radiology Corner

Shoulder Pain in a Power Lifter

Alicia M. Yochum RN, DC, DACBR, RMSK

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A 45 year old female competitive power lifter presented for chiropractic care of her left shoulder pain. The pain was at the anterior superior shoulder and the patient did report the occasional sensation of grinding.

Diagnostic ultrasonography was performed and demonstrated that the pain localized to the acromioclavicular joint which was mildly narrowed with a joint effusion. No abnormal motion was visualized when the joint was stressed utilizing arm flexion and adduction. The right shoulder was also evaluated for comparison (Fig 2) which also showed mild narrowing with a joint effusion. These findings are consistent with mild osteoarthritis of the acromioclavicular joint. No rotator cuff tear or other pathology was present on ultrasound examination.

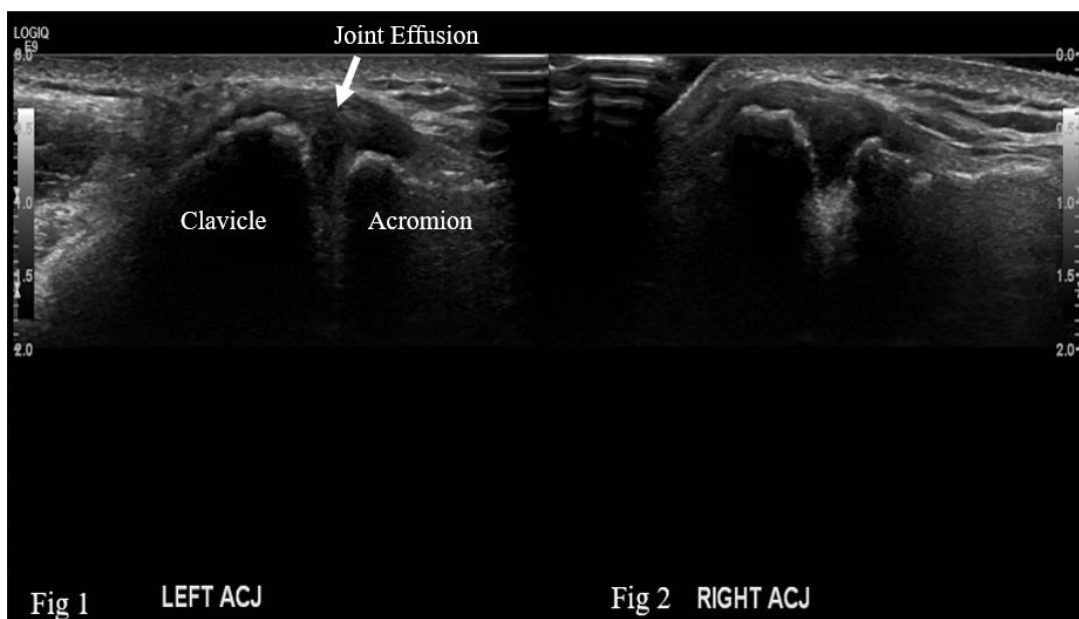
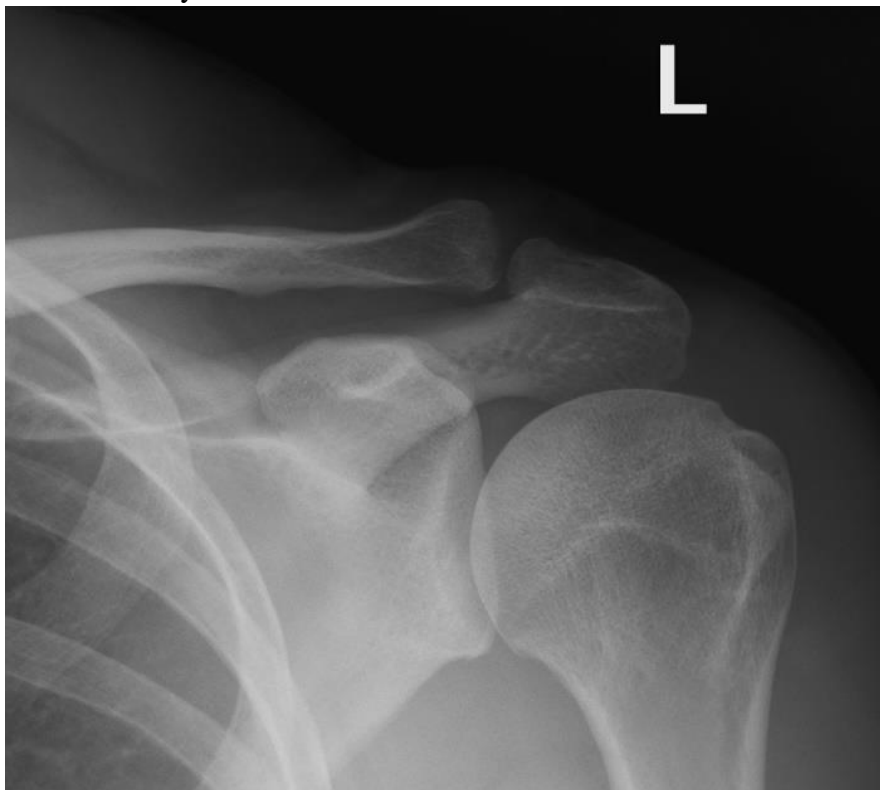


Fig1 and 2: Long axis views of the acromioclavicular joint using diagnostic ultrasound demonstrating a mildly narrowed joint with a joint effusion bilaterally.

Since the patient frequently competes/participates in power lifting the diagnosis of distal clavicular osteolysis was discussed as a possible differential. Due to the limitations of ultrasound, the internal osseous structure and marrow cannot be evaluated therefore plain film radiography was performed (Fig 3). This demonstrated a mildly narrowed acromioclavicular joint without resorption (lucency) of the distal clavicle.

Fig 3: AP external rotation view of the left shoulder demonstrating mild acromioclavicular osteoarthritis without osteolysis.



Distal clavicular osteolysis is associated with weightlifting and the first reported cases were in weightlifters. It occurs from repetitive microtrauma resulting in microfractures of the distal clavicular subchondral bone with attempts at repair. Symptoms include pain at the joint that is exacerbated with lifting which was present in the current case. There is no evidence of osteolysis in this patient on the current imaging, however if the patient continues to lift heavy weight they are at risk for developing osteolysis and this differential should always be investigated in this clinical setting.

Magnetic resonance imaging (MRI) would also be an imaging tool that could be utilized and would show resorption of the clavicle cortex with bone marrow edema. Treatment includes avoidance of provocative maneuvers, modification of weight training techniques such as a deep bench press, ice, rest and rehab to improve joint stability.

References:

1. Schwartzkopf R. et. al. Distal clavicular osteolysis: a review of the literature. Bull of the NYU hospital for Joint Diseases 2008; 66 (2): 94-101

Ortho Quiz

by Steven L. Kleinfield D.C., F.A.C.O.

1. Which statement regarding Talipes Equinovarus is incorrect:
 - a. The foot rotates inward and downward
 - b. The vast majority of these deformities are congenital in nature
 - c. This condition is bilateral about 50% of the time
 - d. Some patients may need to have their Achilles tendon lengthened
 - e. All of the above are correct

2. A flexion deformity of both the PIPJ and DIPJ in the toes is better known as:
 - a. Hammer Toe
 - b. Claw Toe
 - c. Charcot Marie Tooth Disease
 - d. Bunion

3. A flexion deformity of only the PIPJ with the DIPJ extended is better known as:
 - a. Hammer Toe
 - b. Claw Toe
 - c. Charcot Marie Tooth Disease
 - d. Bunion

4. Sesamoiditis in the foot has its pain typically felt where:
 - a. Base of Digit 1
 - b. Base of digit 2
 - c. Base of Digit 3
 - d. Base of Digit 4
 - e. Base of digit 5

5. Another name for a Bunion is:
 - a. Pump Bump
 - b. Hammer Toe
 - c. Hallux Valgus
 - d. Hallux Varus

Current Events

- ❖ The Part I online examination will be available for candidates to take on either Friday, May 18th, or Saturday morning, May 19th, or Friday, July 20th, or Saturday morning July 21st. Apply on the Academy website: <http://dcorthoacademy.org/>
- ❖ Apply for the Lipe Scholarship
Details at <http://www.accoweb.org/lipescholarship.html>
- ❖ The full hours of the following conventions have been accepted by the Academy as qualifying for re-credentialing.
 - American College of Chiropractic Orthopedists 2018 Annual Convention
19 Apr to 21 Apr 2018
Hilton Garden Inn Carlsbad Beach, Carlsbad CA
<https://acoco.wildapricot.org/event-2436518>
 - CFS 2017 Annual Fall Convention
October 5-7, 2017
Chicago Marriott Oak Brook
1401 W 22nd Street | Oak Brook, IL 60523
630.573.8555 www.marriott.com/chiob
<http://www.forensic-sciences.org/convention/>

Answers to Ortho Quiz

1. Which statement regarding Talipes Equinovarus is incorrect:

e. All of the above are correct

<http://www.footeducation.com/page/clubfoot-deformity-talipes-equinovarus>

2. A flexion deformity of both the PIPJ and DIPJ in the toes is better known as:

b. Claw Toe

<http://www.footeducation.com/page/claw-toes>

3. A flexion deformity of only the PIPJ with the DIPJ extended is better known as:

a. Hammer Toe

<http://www.footeducation.com/page/claw-toes>

4. Sesamoiditis in the foot has its pain typically felt where:

a. Base of Digit 1

<http://www.footeducation.com/page/sesamoiditis>

5. Another name for a Bunion is:

c. Hallux Valgus

<https://www.mayoclinic.org/diseases-conditions/bunions/symptoms-causes/syc-20354799>