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Letter from the Editor

James Demetrious, DC, FACO
Editor

It is my pleasure to announce and welcome three new Editorial Review Board Members to the *Journal of the Academy of Chiropractic Orthopedists*:

- Scott Banks, DC
- Ralph Kruse, DC
- Stanley Bacso, DC, FACO

These learned academicians, educators, authors and editors are leaders in healthcare. The Academy is most appreciative of their willingness to serve the journal.

The Self Test prototype that was featured in the June, 2010 issue of the journal has been well received. The Academy board has decided to expand and develop this concept into a means to achieve re-certification credits. Further information is forthcoming.

As always, I would encourage our members to submit original articles, reviews of interesting peer-reviewed research and textbooks reviews for consideration and publication in the *JACO*. Please refer to the Author Submission Guidelines posted on the Academy website at:

<http://www.dcorthoacademy.com/guidelines-authors.php>

James Demetrious, DC, FACO - Editor
Journal of the Academy of Chiropractic Orthopedists

Updates for 2010

James Brandt, DC, MPS, FACO
President, Academy of Chiropractic Orthopedists

The Academy has nearly completed the new and redesigned voluntary re-credentialing for the chiropractic orthopedist. Here are some reasons to re-certify:

- Demonstrate the Diplomate has kept current with new practices, methodologies, equipment, terminology, procedures and evidence based material.
- Demonstrate complying with maintenance of certification (MOC) imposed by governmental agencies, hospitals, managed care groups, employment with medical groups and the public.
- The Institute of Medicine, in their 2003 publication, "Health Professions Education, A Bridge to Quality" published a recommendation that certification bodies, "...require their certificate holders to maintain their competence throughout the course of their careers". (Demonstrating competency)
- Help our Diplomates (Fellows) to better position themselves in a competitive marketplace.
- Improve patient care by maintaining re-certification. Obtaining knowledge through the requirements to maintain your credential.
- Medical-legal arena.
- Requirement credits are relevant to chiropractic orthopedics; you do not have to sit through hours that are irrelevant to your practice of orthopedics.

The Congress of Diplomates will be meeting at the American College of Orthopedists annual symposium in Las Vegas, NV April 28-30. We encourage you to attend the conference and attend the meeting. Diplomates will be presenting cases. This is a collegial atmosphere and a great learning experience. Contact Dr. Jerry Wildenauer if you wish to present a paper. These are a 10-15 minute presentation. Check the website as all the details for the conference are on the home page.

The Academy has been working to expand the JACO. We have been adding Editorial Board members to the journal. They have a wide variety of interests that will help the chiropractic orthopedist. The JACO will play a prominent role in the re-certification process. It's a good idea to read it when you receive each issue.

James Brandt, DC, MPS, FACO
President, Academy of Chiropractic Orthopedists

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Image Gallery

Image Gallery

The Image Gallery is dedicated to the artistic contributions of our readership. The *Journal of the Academy of Chiropractic Orthopedists* invites you to submit drawings, illustrations, or photographs, along with appropriate explanatory information, for consideration of publication within this section. Please forward electronic media via the following Articles Submission hyperlink: aco@dcorthoacademy.com.



Neuschwanstein Castle

Neuschwanstein Castle is a 19th-century Romanesque Revival palace on a rugged hill above the village of Hohenschwangau near Fussen in southwest Bavaria, Germany.

Submitted by: Stephen Capps, DC, FACO

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2011

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Diagnostic Imaging Corner

Case challenge

Michelle A Wessely (1) and Timothy J Mick (2)

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Case History

A 52-year-old male presented with a sit down type fall recently, resulting in severe back pain, centered around L1. There is also a history of long-standing prior trauma related to motorcycle accident, with no focal upper lumbar pain at that time. The chiropractor performed imaging (Figures 1-3).



Figure 1.



Figure 2.



Figure 3.

The most pertinent findings are that there is a burst type compression fracture of L1, with what appears to be relatively mild encroachment of the posterior body on the central spinal canal, although this is better assessed with advanced imaging, if clinically warranted. Loss of vertebral body height is approximately 70% anteriorly, decreasing posteriorly, with no more than 10-15% loss of body height at the extreme posterior margin. There is history of left leg amputation and findings are consistent with this history, noting osteopenia in the region of the left hip joint and an atypical orientation of the left proximal femur, which appears to be markedly externally rotated. There are multiple rounded opacities of varying sizes.

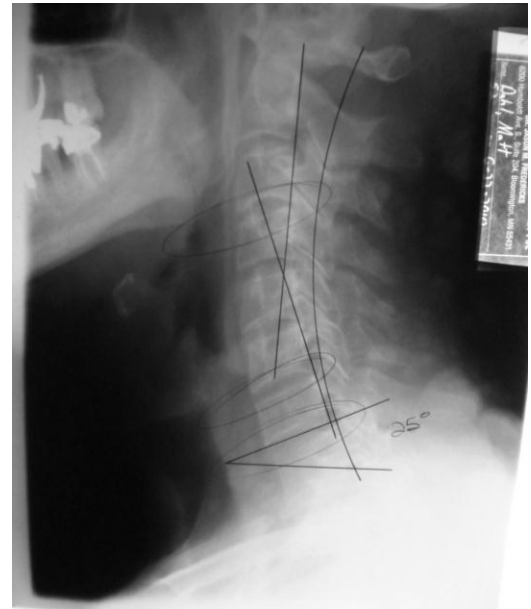


Figure 4.

Most Pertinent Conclusions

1. Radiographic findings of neurofibromatosis, which should be correlated clinically. This condition may be associated with "focal gigantism".
2. Burst type compression fracture of L1, likely acute, based upon the history, although this is better assessed with MRI and MRI would also optimally assess for central canal encroachment and any associated disc abnormality at the adjacent levels. MRI would also assess for possible radiographically occult central neural lesions, noting that there is no obvious foraminal expansion or posterior body scalloping. Although bone density does not appear to be markedly diminished, this would be better assessed with a DEXA scan. An orthopedic consultation is also appropriate, since this may be an unstable type fracture. There is slight focal kyphosis associated with the fracture deformity. Radiographs of the cervical spine were also performed (Figures 4 and 5).



Figure 5.

Most Pertinent Conclusions

Multiple rounded opacities of varying size are noted. The cervical lordosis is at least mildly diminished. There is a mild left cervicothoracic convexity with left rotation and a mild right mid to lower thoracic convexity. Projectional factors may contribute to the appearance of disc space

narrowing in the lower cervical spine on the lateral view.

Conclusions

1. Postural findings, as described.
2. Findings consistent with neurofibromatosis, with numerous superficial soft tissues nodules, characteristic of type 1/chromosome 17 neurofibromatosis (von Recklinghausen's syndrome).
3. Projectional factors may contribute to appearance of disc space narrowing in the lower cervical spine on the lateral view.

Due to the history of trauma and imaging findings, magnetic imaging of the lumbar spine was performed (Figures 6-9).

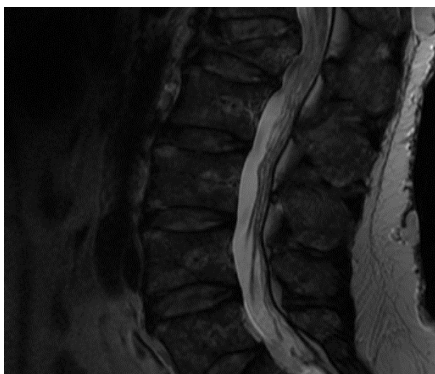


Figure 6.



Figure 7.



Figure 8.

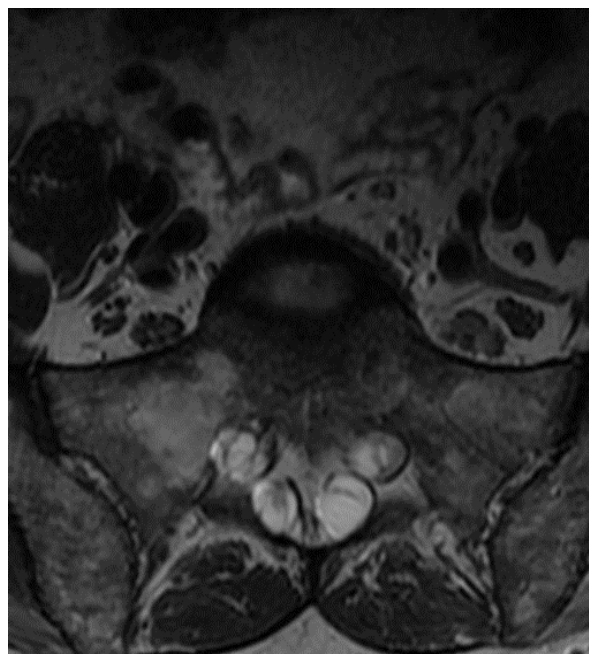


Figure 9.

Case History

Acute low back pain. Evaluate L1 burst fracture. Prior diagnosis of neurofibromatosis.

Technical Information

Sagittal and axial T1 and T2 FSE and sagittal fat sat T2 FSE images, from a 3.0 T scanner of which a small selection are submitted (Figure 6 – sagittal T2, Figure 7 – sagittal T1, Figure 8 – sagittal fat sat T2 FSE and Figure 9 – axial T2 weighted images.

Interpretation of Most Pertinent Findings

There are numerous subcutaneous nodular lesions, consistent with subcutaneous neurofibromas, along with diffuse bilateral root sleeve ectasia involving the thoracolumbar spine and sacral regions. At T12-L1 and L1-2: there is a severe, early subacute, benign appearing burst type L1 compression fracture, with approximately 70% loss of anterior body height, 30% posteriorly and 90% centrally, along with focal 15° kyphosis measured from T12 to L1. There is 7 mm retropulsion of the posterior body margin into the central canal, mildly narrowing the developmentally large canal to a minimum 10 mm AP midline dimension, deforming the thecal sac/mildly crowding the intrathecal roots. The conus terminates at the T12-L1 disc level and is not compressed. Slight disc desiccation at both levels, with no herniation and patent foramina.

Most Pertinent Conclusions

1. Severe, early subacute, benign appearing burst fracture of L1, with 7 mm retropulsion/mild central canal narrowing, mild thecal sac compression and crowding of the intrathecal roots. The severity of the fracture deformity, extension into the middle column and 15° focal kyphosis from T12 to L2 are compatible with an unstable fracture and an orthopedic consultation is recommended. Note also mild left facet joint widening with left greater than right effusions.

2. Typical neurocutaneous lesions of neurofibromatosis, along with thoracolumbar and lumbosacral root sleeve ectasia.

Neurofibromatosis (NFM)

This is an autosomal dominant condition, affecting all 3 germinal layers, able to affect multiple organ systems. Of the eight subtypes that have been described, the 2 main types are those of NFM 1 and NFM 2. The most common type of NFM is that of type 1 which may also be known as Von Recklinghausen's disease and which may affect up to 85% of the population affected by NFM. The less common type of NFM is that of NFM 2 which consists of a relative lack of cutaneous markers, but a high incidence of bilateral acoustic neuromas and central nervous system tumors such as meningiomas and which affects up to 10% of the population affected by NFM. The patient presented in this case exchange was affected by NFM type 1.

NFM is caused by an abnormality, either mutation or lack of the NF1 gene which normally acts as a tumour suppressor, hence the multitude of tumours, cutaneous or otherwise that may occur in a patient with NFM1. Whilst NFM may run in families, over half of those affected have no family member affected. Although it may be apparent at birth that NFM is present, it is particularly during adolescence that the neurofibromas in the cutaneous and subcutaneous regions may become more apparent, or during pregnancy, new lesions may appear.

Conditions associated with NFM 1 include the development of malignant peripheral nerve sheath tumours or neurosarcomas, which carry a poorer prognosis when they affect patients with NFM 1 compared to those without. Learning disabilities are seen in up to 40% of patients with NFM 1. Other problems encountered in patients with NFM 1 include scoliosis which may be more rapidly progressive in children under the age of 10 years old. Bony abnormalities may include sphenoid

bone dysplasia, pseudoarthroses affecting the fibula in particular, dural ectasia leading to posterior scalloping and intramedullary fibrosis.

Osteoporosis may be encountered in patients with NFM 1 particularly in childhood, which has been attributed to increased rates of bony resorption.

Vitamin D deficiency may also play a role in the development of osteopenia in patients with NFM 1.

Vascular lesions may include renal artery stenosis, aneurysms and in up to 6% of children affected by NFM 1, patients may suffer with cerebral arteriopathy. Focal gigantism/gigantism may occur

resulting in enlargement of the osseous and/or soft tissue structures which is likely the cause for the amputation in this patient.

Useful websites:

<http://chorus.rad.mcw.edu/doc/00722.html>

<http://indexmedicus.afro.who.int/iah/fulltext/neurofibromatose.pdf>

[http://www.learningradiology.com/archives2009/COW%20367-](http://www.learningradiology.com/archives2009/COW%20367-Macrodactyly/macrodactylycorrect.htm)

[Macrodactyly/macrodactylycorrect.htm](http://www.learningradiology.com/archives2009/COW%20367-Macrodactyly/macrodactylycorrect.htm)

Abstracts & Literature Review

Humeral Insertion of the Supraspinatus and Infraspinatus New Anatomical Findings Regarding the Footprint of the Rotator Cuff

Tomoyuki Mochizuki, MD, Hiroyuki Sugaya, MD, Mari Uomizu, MD, Kazuhiko Maeda, MD, Keisuke Matsuki, MD, Ichiro Sekiya, MD, Takeshi Muneta, MD, and Keiichi Akita, MD

J Bone Joint Surg Am. 2008;90:962-9

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Authors' Abstract

Background: It is generally believed that the supraspinatus is the most commonly involved tendon in rotator cuff tears. Clinically, however, atrophy of the infraspinatus muscle is frequently observed in patients with even small to medium-size rotator cuff tears. This fact cannot be fully explained by our current understanding of the anatomical insertions of the supraspinatus and infraspinatus. The purpose of this study was to reinvestigate the humeral insertions of these tendons.

Methods: The study included 113 shoulders from sixty-four cadavers. The humeral insertion areas of the supraspinatus and infraspinatus were investigated in ninety-seven specimens. In sixteen specimens, all muscular portions of the supraspinatus and infraspinatus were removed, leaving the tendinous portions intact, in order to define the specific characteristics of the tendinous portion of the muscles. Another twenty-six shoulders were used to obtain precise measurements

of the footprints of the supraspinatus and infraspinatus.

Results: The supraspinatus had a long tendinous portion in the anterior half of the muscle, which always inserted into the anterior most area of the highest impression on the greater tuberosity and which inserted into the superior most area of the lesser tuberosity in 21% of the specimens. The footprint of the supraspinatus was triangular in shape, with an average maximum medial-to-lateral length of 6.9 mm and an average maximum anteroposterior width of 12.6 mm. The infraspinatus had a long tendinous portion in the superior half of the muscle, which curved anteriorly and extended to the anterolateral area of the highest impression of the greater tuberosity. The footprint of the infraspinatus was trapezoidal in shape, with an average maximum medial-to-lateral length of 10.2 mm and an average maximum anteroposterior width of 32.7 mm.

Conclusions: The footprint of the supraspinatus on the greater tuberosity is much smaller than

previously believed, and this area of the greater tuberosity is actually occupied by a substantial amount of the infraspinatus.

Clinical Relevance: The present study suggests that rotator cuff tears that were previously thought to involve only the supraspinatus tendon may in fact have had a substantial infraspinatus component as well.

JACO Editorial Summary:

- The article was written by authors from the Unit of Clinical Anatomy, Graduate School, Tokyo Medical and Dental University, Tokyo, Japan where the research was conducted.
- The purpose of the study was to reevaluate macroscopically the humeral insertions and tendinous structures of the supraspinatus and infraspinatus in cadaver shoulders.
- The investigative researchers provide an in depth anatomical dissection of 113 shoulders and 64 cadavers average of 77.3 years at the time of death in an attempt to explore and define the footprint of the supraspinatus and infraspinatus muscles a part of the rotator cuff group.
- It is generally believed the supraspinatus is the most commonly involved tendon in rotator cuff tears, however clinically the infraspinatus has shown atrophy in patients with even small to medium cuff tears. Currently tears are assessed preoperatively with the use of ultrasonography and magnetic resonance imaging and are diagnosed on the basis of intraoperative findings.
- Most anatomy textbooks state the supraspinatus inserts into the highest impression or the greater tuberosity of the humerus and the infraspinatus into the middle impression of the greater tuberosity .

However the difficulty separating these tendons and delineating their footprints because of their interdigitated fibers overlapping one another has been problematic.. However in all specimens, after removal of the coraco-humeral ligament and the loose connective tissues overlying the supraspinatus and infraspinatus near their insertions could be clearly traced. The infraspinatus was found to occupy about half of the highest impression and all of the middle impression of the greater tuberosity of the humeral head. The supraspinatus was found to be inserted into the highest impression of the greater tuberosity as well as the lesser tuberosity. The infraspinatus was not.

- The anatomical findings in the study suggest that surgeons need to have increased awareness of pathological conditions of the infraspinatus tendon especially when delaminating is observed. It may be important for surgeons to incorporate these new anatomical findings in order to properly restore the geography of the footprint of the torn anterior rotator cuff.
- The supraspinatus has traditionally been considered to be an important abductor among the rotator cuff muscles. However several researchers have reported that the infraspinatus contributes as much to abduction as does the supraspinatus.
- **Summary:**
 - The results of this investigation should raise awareness in assisting the orthopedic surgeons as well as the treating non-surgical team of therapists including chiropractic physicians and/or orthopedic specialists to better focus on the conditions/injury to the rotator cuff and improved rehabilitation methods allowing for the opportunity of maximizing outcomes.

Abstracts & Literature Review

Cervical Radiculopathy vs Parsonage–Turner Syndrome: a Case Report

Joseph H. Feinberg, MD, David A. Doward, MD, Alita Gonsalves, MD

HSSJ (2007) 3: 106–111. Published online: 22 December 2006
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JACO Editorial Reviewer: Gregory C. Priest, DC, FACO

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Authors' Abstract:

No Abstract was provided by the authors.

JACO Editorial Reviewer's Abstract: This is a case report of an atraumatic 42-year-old recreational cyclist that presented to the Physiatry Department of the Hospital for Special Surgery in New York, NY with a 3-month history of right-sided neck pain, right periscapular pain, severe headaches and right upper extremity numbness and weakness. Her physical examination was felt to be suggestive of possible cervical radiculopathy and/or Parsonage-Turner syndrome, and electrodiagnostic testing was notable for findings consistent with C7 radiculopathy. Cervical spine and head CT studies were found to be normal. Two cervical MRI studies were completed, the first of which was reportedly normal and the second of which was reported to have revealed degenerative changes but did not demonstrate significant nerve root compression.

The patient underwent a course of treatment which included medications and physical therapy. Her symptoms completely resolved over the course of a number of months, and the authors noted that at one-year follow-up the patient remained symptom-free with almost full strength and had returned to all previous activities, including recreational cycling.

Parsonage-Turner syndrome is one of the more common idiopathic causes of atraumatic brachial plexopathy and was originally described in 1948 although a patient with similar clinical findings was reported in 1897. Parsonage-Turner syndrome is also known as brachial plexitis, brachial neuritis, acute brachial plexus neuropathy and neuralgic amyotrophy.

The etiology of Parsonage-Turner syndrome is in dispute, with 25% of occurrences reported after viral infection, and 15% after immunization. Other possible factors are reported to include injury to a remote area, as well as post-exercise and post-surgical occurrences.

JACO Editorial Summary:

- As chiropractic physicians, we frequently encounter patients with symptomatology suggestive of cervical radiculopathy, and we would do well to consider in our differential diagnosis the possibility that these patients may be suffering from Parsonage-Turner syndrome.
- The authors acknowledge the similarity between cervical radiculopathy and Parsonage-Turner syndrome, and provide an excellent list of differential diagnoses to consider when we

encounter a patient that presents with these signs and symptomatology.

- It was noted that the authors have evaluated many patients who were diagnosed with cervical radiculopathy but were without MRI evidence of nerve root compression, and in fact the authors commented that some of these patients may have had undiagnosed Parsonage-Turner syndrome. In particular, the authors suggest that the diagnosis of Parsonage-Turner syndrome or a variant thereof should be considered when evaluating patients that present with radicular symptoms in the presence of poor anatomic correlation on imaging studies.
- The authors posit that a short course of antiviral medication may play a role when the diagnosis is unclear in a patient presenting with radicular symptoms in the lack of sufficient anatomic correlation on imaging.
- This reviewer is of the opinion that this article, which demonstrates the diagnostic conundrum presented by patients with radicular symptoms without anatomic correlation on imaging studies, illustrates beautifully the truth of the aphorism that as prudent physicians, we treat the patient standing before us, not the imaging study.

Abstracts & Literature Review

The Effect of Backpacks on the Lumbar Spine in Children: A Standing Magnetic Resonance Imaging Study

Neuschwander, Timothy B. MD; Cutrone, John MD; Macias, Brandon R. BA; Cutrone, Samantha; Murthy, Gita PhD; Chambers, Henry MD; Hargens, Alan R. MD

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Author's Abstract

Study Design: This study is a repeated measures design to measure the lumbar spine response to typical school backpack loads in healthy children. The lumbar spine in this setting was measured for the first time by an upright magnetic resonance imaging (MRI) scanner.

Objective: The purpose of this study is to measure the lumbar spine response to typical school backpack loads in healthy children. We hypothesize that backpack loads significantly increase disc compression and lumbar curvature.

Summary of Background Data: Children commonly carry school backpacks of 10% to 22% bodyweight. Despite growing concern among parents about safety, there are no imaging studies which describe the effect of backpack loads on the spine in children.

Methods: Three boys and 5 girls, age 11 ± 2 years (mean $\pm$ SD) underwent T2 weighted sagittal and coronal MRI scans of the lumbar spine while standing. Scans were repeated with 4, 8, and 12 kg

backpack loads, which represented approximately 10%, 20%, and 30% body weight for our sample. Main outcome measures were disc compression, defined as post- minus preloading disc height, and lumbar asymmetry, defined as the coronal Cobb angle between the superior endplates of S1 and L1.

Results: Increasing backpack loads significantly compressed lumbar disc heights measured in the midline sagittal plane ($P < 0.05$, repeated-measures analysis of variance [ANOVA]). Lumbar asymmetry was: $2.23^\circ \pm 1.07^\circ$ standing, $5.46^\circ \pm 2.50^\circ$ with 4 kg, $9.18^\circ \pm 2.25^\circ$ with 8 kg, and $5.68^\circ \pm 1.76^\circ$ with 12 kg (mean $\pm$ SE). Backpack loads significantly increased lumbar asymmetry ($P < 0.03$, one-way ANOVA). Four of the 8 subjects had Cobb angles greater than 10° during 8-kg backpack loads. Using a visual-analogue scale to rate their pain (0-no pain, 10-worst pain imaginable), subjects reported significant increases in back pain associated with backpack loads of 4, 8, and 12 kg ($P < 0.001$, 1-way ANOVA).

Conclusion: Backpack loads are responsible for a significant amount of back pain in children, which

in part, may be due to changes in lumbar disc height or curvature. This is the first upright MRI study to document reduced disc height and greater lumbar asymmetry for common backpack loads in children.

JACO Editorial Summary:

- The article was written by authors from the Department of Orthopaedic Surgery, University of California, San Diego, TrueMRI, San Diego, and the Rady Children's Hospital, San Diego.
- The authors revisit lumbar spine response to typical school backpack loads in healthy children, however, this time, adding for the first time, upright MRI imaging. References for this work span from 1985 to 2008.
- The authors hypothesize that backpack loads significantly increase disc compression and lumbar curvature. Upright scans viewed the effects of 4, 8 and 12 kg backpack loads, representing approximately 10%, 20% and 30% of body weight of participants.
- Increasing backpack loads significantly compressed lumbar disc heights measured in the midline sagittal plane; significantly increased lumbar asymmetry; and are responsible for a significant amount of back pain in children.
- This is the first upright MRI study to document reduced disc height and greater lumbar asymmetry for common backpack loads in children. Kimura S, Steinbach GC, Watenpaugh DE, Hargens AR previously explored this measurement in recumbent MRI studies, reporting their findings in ***Lumbar Spine Disc Height And Curvature Responses To An Axial Load Generated By A Compression Device Compatible With Magnetic Resonance Imaging***, Spine, Vol 26 # 23, pages 2596-2600, 2001. In this study, Kimura, et al, used a compression device compatible with magnetic resonance imaging, to test two hypotheses: Axial loading of 50% body weight from shoulder to feet in supine posture 1) simulates the upright lumbar spine alignment and 2) decreases disc height significantly. Neuschwander, et al, are the first investigators to demonstrate loss of disc height in upright MRI positioning, and under axial loading with backpacks.
- In 1995, Harreby, et al first questioned adolescent risk factors for adult LBP, in ***Are Radiologic Changes In The Thoracic And Lumbar Spine Of Adolescents Risk Factors For Low Back Pain In Adults?: A 25-Year Prospective Cohort Study Of 640 School Children***, Spine Vol 20, #21, 1995, pages 2298-2302. This study suggests that low back pain in the growth period is 'a real problem,' with a trend toward aggravation as time passes. Thus, implementing preventive measures in schools may be very important.
- While in 1995, adolescent risk factors were suggested as contributors trending toward adult LBP, the Neuschwander 2009 study categorically identifies loading effects on the lumbar spine, which, as they become chronic, lead toward the breakdown of spine biomechanical properties. The ultimate effect is probable chronic adult low back pain. Harreby advocated prevention. With the Neuschwander data, prevention is penultimate.

Abstracts & Literature Review

Indications for Computed Tomography In Patients With Minor Head Injury

Michelle J. Haydel, M.D.; Charles A. Preston, M.D.; Trevor J. Mills, M.D.; Samuel Luber, B.A.; Erick Blaudeau, M.D.; and Peter M..C. DeBlieux, M.D.

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Authors' Abstract:

Background: Computed tomography (CT) is a widely used screening test in patients with minor head injuries even though the results are often normal. A study was performed to develop and validate clinical criteria's to identify patients with minor head injuries who do not need to undergo CT

Methods: The study consists of two phases. The first phase consisted of 520 consecutive patients with minor head injury who had normal score on the Glasgow Coma Scale and normal findings on the brief neurologic examinations and were given a CT. Using recursive partitioning the study derived a set of criteria to identify all patients who had abnormalities of CT scanning. The second phase, the sensitivity and specificity of the criteria for predicting a positive scan were evaluated in a group of 909 patients.

Results: Of the 520 patients in the first phase, 36 (6.9 percent) had a positive scan. All patients with positive CT scans had one or more of the following seven findings: headache, vomiting, as age over 60 years, drug/alcohol intoxication, deficits in short-term memory, physical evidence of trauma above clavicles and seizure. Second phase consisted of

909 patients in which 57 (6.3 percent) patients had positive scans. This group experienced the sensitivity of the seven findings combined with 100 percent (95 confidence interval, 95 to 100 percent). All patients with positive CT scans had at least one of the seven findings.

Conclusions: Patients with minor head injury, the use of CT scan can be safely limited to those patients who have certain clinical findings (N Engl J Med 2000; 343:100-5).

JACO Editorial Summary:

- The authors performed a study involving 1429 patients in two different method phases to arrive at their conclusion.
- The authors basically used consultations, clinical findings along with Glasgow Coma Scale as criteria's to determine minor head injury and the use of CT scans.
- The question regarding the criteria's for performing CT on head traumas has been controversial since the 1970's when computed tomography were introduced.

- Initially CT was reserved for severely injured patients.
- Between the 1970's and the 1980's minor head injuries CT evaluations became more common for patients with intracranial lesions.
- In the early 1990's several retrospective studies of patients with minor head injury reported substantial proportions with intracranial lesions on CT evaluations (17 to 20 percent).
- These studies included patients with scores of 13-15 and a level 3 on the Glasgow Coma Scale.
- Glasgow Coma Scale score of 13-15 indicated little to no impairment in consciousness. A Glasgow Coma Scale of 15 indicates normal motor and verbal responses and normal eye opening.
- Glasgow Coma Scale score of 3 indicates no motor or verbal response and no opening of the eyes.
- The authors of the 1990's retrospective studies concluded that CT was indicated in all patients with minor head injury.
- Subsequent prospective studies involving a Glasgow Coma Scale with a score of 15, the rate of intracranial lesions on CT evaluation was much lower (6-9 percent).
- Several studies have been performed in evaluating clinical finding as a tool in finding predictors of intracranial lesions in patients with minor head injury.
- In two studies were selective use of CT on basis of clinical findings identified 96 percent and 98 percent of the patients with abnormalities' on CT scanning's
- None of the patients that had CT abnormalities and who did not have specified clinical findings required neurosurgery.
- A study was conducted to derive and validate a set of clinical criteria that could be use to identify patients with minor head injury in whom CT could be forgone.
- Two phases of studies were performed to determine criteria's standards in the use of CT evaluation of minor head injury.
- An independent radiologist randomly evaluated 50 of the studies which were performed by the studies radiologists.
- There were three clinical findings significantly associated with a positive CT scan. 1. Short –term memory deficits 2. Drug or alcohol intoxication. 3. Physical evidence of trauma above the clavicles.
- Study reveal recursive-partitioning analysis yielded seven findings which identified all patients with positive CT scans. 1. Headache. 2. Over age of 60. 3 Vomiting. 4. Drug or alcohol intoxication. 5. Deficits in short-term memory. 6. Physical evidence of trauma above the clavicles. 7. Seizures.
- All patients with a positive CT scan had at least one of the seven findings.
- Physical examination findings that have been associated with positive CT scan are linear, basilar, depressed skull fracture, scalp hematoma and soft tissue injury.
- This study will assist the physician in his or her clinical knowledge and criteria's of evaluating and ordering CT scans for the benefit of their patients.

Discussion: Data shows that approximately two thirds of patients with head trauma in the United States are

classified as having minor head injury; out of this group less than ten percent have positive findings on CT scans and less than one percent requires neurosurgical intervention. Several studies have concluded that

patients having normal neurological findings and normal CT scans can be safely discharged from emergency departments.

Abstracts & Literature Review

Current Concepts Review The Assessment of Fracture Risk

Aasis Unnanuntana, MD, Brian P. Gladnick, BA, Eve Donnelly, PhD, and Joseph M. Lane, MD

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Authors' Abstract:

Background: Bone mineral density is considered to be the standard measure for the diagnosis of osteoporosis and the assessment of fracture risk. The majority of fragility fractures occur in patients with bone mineral density in the osteopenic range.

Methods: We review the parameters and methods used to assess fracture risk, which include bone mineral density as assessed with dual x-ray absorptiometry, the Fracture Risk Assessment Tool (FRAX), bone turnover, and biochemical bone markers.

Results: The Fracture Risk Assessment Tool (FRAX) can be used as an assessment modality for the prediction of fractures on the basis of clinical risk factors, with or without the use of femoral neck bone mineral density. Treatment of osteoporosis should be considered for patients with low bone mineral density (a T-score of between -2.1 and -2.5) as well as a ten-year risk of hip fracture of a greater than or equal to 3% or a ten-year risk of a major osteoporosis-related fracture of greater than or equal to 20% as assessed with the FRAX. Biochemical bone markers are useful for monitoring the efficacy of anti-resorptive or anabolic therapy

and may aid in identifying patients who have a high risk of fracture.

Conclusions: An approach combining the assessment of bone mineral density, clinical risk factors for fracture with use of the FRAX, and bone turnover markers will improve the prediction of fracture risk and enhance the evaluation of patients with osteoporosis.

JACO Editorial Summary:

- The article was written by authors from Department of Orthopaedic Surgery, Hospital for Special Surgery; and Weill Cornell Medical College, Cornell University.
- The National Institutes of Health Consensus Development Panel on Osteoporosis Prevention, Diagnosis, and Therapy defines osteoporosis as a skeletal disorder characterized by low bone strength and increased risk of fracture.
- The authors provide a review of the factors that contribute to bone strength, with a review of the parameters and methods used to assess fracture risk.

- Notably, the authors reflect upon bone mineral density, the Fracture Risk Assessment Tool (FRAX), bone turnover, and biochemical bone markers.
- “On the basis of a series of meta-analyses undertaken to identify clinical risk factors for osteoporosis, the Fracture Risk Assessment Tool (FRAX) was developed. FRAX, released in 2008 by the World Health Organization, was developed and validated under the direction of Professor John Kanis with the support of many individuals and organizations including the American Society for Bone and Mineral Research, the National Osteoporosis Foundation, the International Society for Clinical Densitometry, and the International Osteoporosis Foundation.”
- FRAX is currently available online at www.shef.ac.uk/FRAX
- The authors report that bone mineral density reflects only one component of bone strength, and that FRAX can be used with or without the use of femoral neck bone mineral density, for the prediction of fractures on the basis of clinical risk factors.
- In the current article, the authors state that an improvement in the prediction of fracture risk might be seen by using a combination of the assessment of bone mineral density, with use of FRAX, along with bone turnover markers.

Announcements

American College of Chiropractic Orthopedists Annual Convention to be held in Las Vegas – April 28-30, 2011

Mark your calendars for the 2011 ACCO convention that will be held April 27th-30th, 2011. We will be meeting at the new Tropicana in Las Vegas. The College has lowered the convention price. We have some great speakers scheduled. Please note there will be a class on Thursday night and no class on Sunday.

The room rate is \$125.00 on Friday and Saturday and \$95.00 on Sunday through Thursday. There are no resort parking fees. The hotel is close to the airport. There are no charges for children under 18 staying in rooms with parents.

Please plan on joining us in Las Vegas in 2011. More information is forthcoming from the ACCO. Contact the ACCO for information and to register.

Council of Chiropractic Orthopedists

Drs. Dale Huntington and Gary Carver will be attending the ACA/HOD annual meeting in Newport, RI on September 29-October 2, 2010. They will be representing the Council on Chiropractic Orthopedics at the meeting. Dr. Carver who will also be representing Missouri as its state delegate. Dr. Huntington will be representing the orthopedic specialty on the Resolutions committee as well as the American Board of Chiropractic Specialties.

Congress of Diplomates Meeting – April 30, 2011

The Congress of Diplomates will meet April 30, 2011 at the American College of Chiropractic Orthopedists (ACCO) symposium in Las Vegas, NV.

The Academy would like to offer the specialty an opportunity to present interesting cases or discuss research projects with other Diplomates. Diplomates are invited by this notice to present papers to the conference attendees. These are 10-15 minutes presentations of cases or research work.

Contact Dr. Jerry Wildenauer at (aco@dcorthoacademy.com) to reserve your spot. This has always been well received by the conference attendees. Don't wait, contact the Academy.

Editorial Review Board Annual Meeting

The Journal of the Academy of Chiropractic Orthopedists will convene an ERB meeting during the American College of Chiropractic Orthopedists Annual Convention on April 28, 2011. All ERB members are cordially invited to this meeting. More information is forthcoming from the Academy.

Visit the New Web Site of the Academy of Chiropractic Orthopedists

www.DCOrthoAcademy.com

The Academy is working in a proactive manner as an advocate of chiropractic patients, chiropractic orthopedists and the chiropractic profession. Many advances and services are being offered by the Academy including:

- Chiropractic Orthopedic Diplomate Examination
- Orthopedic Diplomate Re-Credentialing and Re-Certification
- Membership among respected leaders of the chiropractic profession
- Up to date database to inform Insurance Industry / Legal / Patient / Consumers of your membership among elite professionals
- The Journal of the Academy of Chiropractic Orthopedists (JACO) - A peer-reviewed, indexed journal that promulgates academic excellence and higher learning.

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