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Journal of the Academy of Chiropractic Orthopedists

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Letter from the Editor in Chief - A New Decade in Health Care

Letter from the Editor – A Year in Review – 2009

Image Gallery

- ❖ Step Pyramid at Saqqara, Egypt. *JACO*. 2009;6(4).

Diagnostic Imaging Corner

- ❖ Case Challenge. *JACO*. 2009;6(4).

Abstracts & Literature Review

- ❖ Cervical spondylosis with spinal cord encroachment: should preventive surgery be recommended? : An Editorial Review. *JACO*. 2009;6(4).
- ❖ Does Lumbar Facet Arthrosis Precede Disc Degeneration? A Postmortem Study: An Editorial Review. *JACO*. 2009;6(4).
- ❖ Standards of Care for Acute and Chronic Musculoskeletal Pain.: The Bone and Joint Decade (2000 – 2010): An Editorial Review. *JACO*. 2009;6(4).
- ❖ Accuracy of MRI vs. CT for Evaluating Cervical Spine Facet Arthrosis.: An Editorial Review. *JACO*. 2009;6(4).
- ❖ Performance-Enhancing Drugs and Today's Athlete: A Growing Concern.: An Editorial Review. *JACO*. 2009;6(4).
- ❖ Exercises for spine stabilization: motion/motor patterns, stability progressions, and clinical technique. An Editorial Review. *JACO*. 2009;6(4).

Announcements

- ❖ American College of Chiropractic Orthopedists Annual Convention
- ❖ Academy of Chiropractic Orthopedists – New Web Site and Membership Benefits Information

A New Decade in Health Care

Bruce Gundersen, DC, FACO

Editor-In-Chief, *Journal of the Academy of Chiropractic Orthopedists*

We look forward to a new decade in the health care delivery industry with great anticipation and with some fear. Perhaps the fear comes from the uncertainty of change. We know the environment will change for each of us. We know that how we approach reimbursement will likely change a great deal. We know that how our patients come to us will also change a lot. One thing is for certain and that is that our attention to caring for patients must not change. If we are to endure this transition period, we need to make certain that we do everything a little better.

My advice to you is simple and proven to be effective at every level of delivery. Be a little kinder to each patient, to each staff member, to each billing clerk and to each carrier. Be a little more attentive to casual complaints, be a little more diligent in examining each area; be a little more aware of the patient's pain. Be just a little more interested in every ache and pain that walks into your office. Be a little more interested in the family and friends of each patient. Be a little better at reading the current literature and be a little more interested in submitting your work to the *JACO*. Be a little better at explaining the newest information to your patient regarding his condition. Be a little better in quickly defining, treating and resolving the complaints of your patients. Be a little better at getting them well as fast as you can, out the door and happy about it. Be a little better in working as a competent member of the health care delivery community and establishing for yourself, a reputation as such.

As we approach our fears of the future, rest assured that patients will always need what we have to provide for them. We will always be needed if we do a little better at serving our patients. That is the main focus and the premise from which we must continue. Do a little better in serving your patients and your fears will gradually fade away. There will always be a place for the provider who cares the most.

As Always your friend,

Bruce Gundersen, DC, FACO

Editor-In-Chief

A Year in Review - 2009

James Demetrious, DC, FACO

Editor, *Journal of the Academy of Chiropractic Orthopedists*

With the advent of 2009, the Academy of Chiropractic Orthopedists endeavored to improve and expand its services to its members. The development of our new journal format represents a small part of the many projects undertaken this past year.

It has been my honor to serve as Editor of the *Journal of the Academy of Chiropractic Orthopedists* over the past year. I greatly appreciate the opportunity given to me by the Academy and Bruce Gundersen, DC, FACO, our *JACO* Editor in Chief, to work on behalf of our members in this manner. In 2010, I will be stepping down as editor and will continue to work on behalf of the journal as an Editorial Review Board member once again.

The upcoming year is important. We have much work to perform to elevate the Academy, chiropractic orthopedics and our great profession to even higher levels of societal acceptance and utilization. Continued work is needed to improve upon our journal:

- We are now approved for indexing by Google Scholar. Past articles need to be submitted for indexing.
- Qualified editor and committee member nominations are always welcome.
- As always, the life blood of any journal is the submission of original manuscripts. Please write and submit your instructive cases and share your work with your colleagues.

On behalf of the Academy of Chiropractic Orthopedists,

Thank you,

James Demetrious, DC, FACO
Editor

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.



Step Pyramid at Saqqara, Egypt - April 2009

Intended to hold his mummified body, Pharaoh Djoser's Step Pyramid at Saqqara began as a traditional, flat-roofed mastaba. However, by the end of his 19-year reign, in 2611 B.C., it had risen to six stepped layers and stood 204 feet (62 meters) high. It was the largest building of its time. Extensive use of stone—here and there carved to resemble wood, reeds, or other softer materials—made the tomb more durable than its mud-brick forerunners. Such pioneering techniques led many ancient historians to credit the chief architect, Imhotep, with inventing stone architecture. The Step Pyramid complex was enclosed by a 30-foot (10-meter) wall and included courtyards, temples, and chapels covering nearly 40 acres (16 hectares)—the size of a large town in the third millennium B.C. As in earlier mastaba tombs, the Step Pyramid's burial chambers are underground, hidden in a maze of tunnels, probably to discourage grave robbers. The tomb was nevertheless plundered, and all that remains of Djoser, the third king of Egypt's 3rd dynasty, is his mummified left foot.

Submitted by: Ronald C. Evans, DC, FACO, FICC

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Diagnostic Imaging Corner

Case Challenge

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Case History

A 15 year old female presented to the emergency room having sustained a sprained ankle. Prior to her presentation, developed severe pain immediately along the anteromedial aspect of the right foot and presented with a painful limp, with limited active and passive range of motion, globally. The clinical examination revealed edema surrounding the medial and lateral malleoli, and a focal swelling anteromedial to the medial malleolus. Imaging was performed, presented in Figure 1.



Figure 1. Radiographs of the right ankle from 2006.

What are your imaging findings?

What is your clinical/imaging diagnosis?

Imaging observations

What are your imaging findings?

AP and lateral views of the right ankle demonstrate an abnormal ossific density superimposed over the anterior process/facet of the calcaneus on the lateral view. On the AP view, the same osseous density is noted along the medial aspect of the foot, adjacent to the navicular. There is no evidence of accompanying soft tissue swelling.

What is your clinical/imaging diagnosis?

Type 2 accessory navicular of the right foot.

Management

The patient was discharged from the emergency room with the clinical diagnosis of a sprain of the medial collateral ligaments of the right ankle. The treatment provided was to place the patient in a plaster cast with no weight-bearing for several weeks. The symptoms diminished, but never fully resolved, although the patient returned to normal activity.

Two years later, the patient continued to have pain, and noticed swelling around the anteromedial aspect of her foot (Figure 2).



Figure 2a. Clinical image of the medial aspect of the right foot, in which an elevated red region was noted by the patient and clinician, in conjunction with a palpable mass.

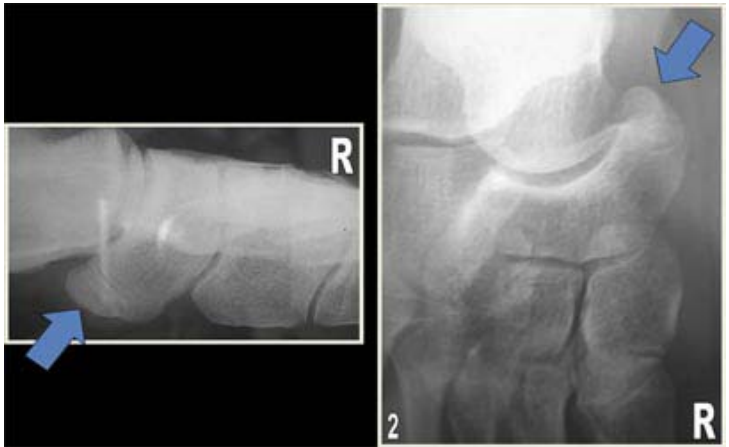


Figure 2c. On the lateral and medial oblique radiographs, the additional ossific density is more readily seen lying medial and slightly proximal to the navicular (arrows), with evidence of a well corticated surface apposing that of the parent navicular.

She also noticed that the pain was provoked by wearing particular shoes and it was impossible for her to wear high heels. Imaging was performed at this time, as part of the clinical work-up (Figures 3 and 4).



Figure 2b. The more recent radiographs of the ankle, from 2008 show the region of abnormality particularly well demonstrated on the lateral view (oval).

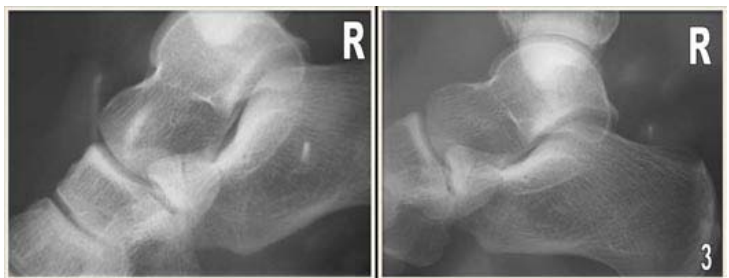


Figure 3. Radiographic imaging comparison of lateral ankle views performed in 2006 (left) and 2008 (right) where the osseous abnormality is demonstrated on both images.



Figure 4. Dorsoplantar view of the left foot of the same patient demonstrating a smaller ossific density medial to the navicular, a type 1 accessory navicular or true os tibiale externum. As is typically the case, this was an asymptomatic incidental finding.

The patient then consulted an orthopedic surgeon, who ordered MR imaging of the ankle (Figure 5).



Figure 5b

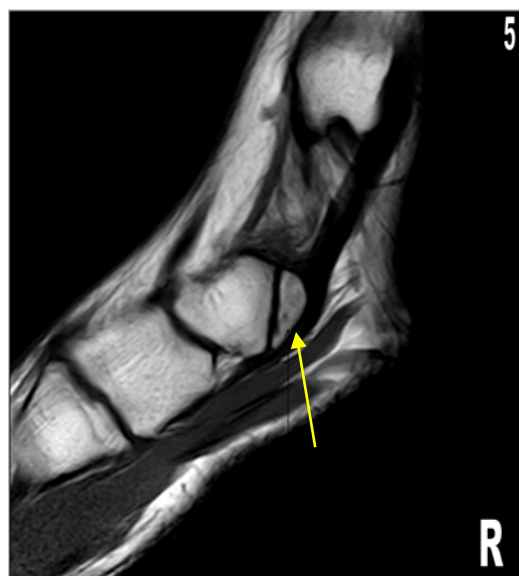


Figure 5a



Figure 5c

Figure 5. MR imaging of the right foot demonstrating the relationship between the accessory navicular (Figure 5a – arrow) and the tibialis posterior tendon, seen in Figure 5a, a sagittal T1-weighted MR image of the right ankle, where a long low signal oblique structure, the tendon of tibialis posterior, extends proximally and slightly posteriorly from the os tibiale externum. In Figure 5b, fat suppressed T2 sagittal MR image of the right ankle, shows an irregular, low signal division between the accessory navicular and the parent navicular bone (arrow) which may represent a fibrous connection between the two structures. There is no evidence of fluid at this margin which suggests that there is no pseudoarticulation here, another potential cause of focal pain in these patients. In Figure 5c, a short axis MR image of the right ankle, also a fat suppressed T2 weighted image demonstrates the accessory navicular and the low signal fibers of the tibialis posterior tendon extending along its posterior margin (arrow).

A diagnosis was made of an accessory navicular with tendinopathy of the tibialis posterior tendon and the patient was offered surgery to remove the accessory navicular followed by physiotherapy. However, her sister was a chiropractic student and the patient elected to be treated with chiropractic management, consisting of adjusting the ankle, through regions of joint restriction, soft tissue work, especially to the tibialis posterior and evaluation and treatment to address abnormalities of lower limb kinematics. The patient was satisfied with the treatment, with a reduction in her pain and swelling.

Discussion

There are a number of accessory ossicles of the foot and ankle. The os tibiale externum and accessory navicular are examples of the more common accessory ossicles associated with the navicular. Other accessory ossicles about the foot and ankle include the os trigonum, os peroneum and os supranaviculare. The original description of accessory ossicles about the navicular was of the os tibiale externum was in 1605 by Bauhin, cited by Geist. (1,2) The os tibiale externum has been reported in 10 to 16% of the population or 2 – 9% of dry specimens and is bilateral in 50 to 90% of cases,

typically developing during adolescence. It is slightly more common in woman. (3)

The os tibiale externum has been referred also to as an os naviculare secundarium or accessorium, cornuate navicular, prehallux and bifurcated hallux. (4) However only if the accessory ossicle is seen as a sesamoid bone within the tendon of tibialis posterior is the term os tibiale externum applied. Clinically it is located along the medial and posterior aspect of the navicular and the patient may have noticed that either unilaterally or bilaterally that there is a bump, or that a particular preference for shoes has been noted, based on the bony irregularity.

The navicular is the last ossification center of the tarsal bones to appear radiographically, visible at 3 to 5 years old, and fully ossifying by between the ages of 9 and 11 years old, usually about one year earlier in girls. (5) Accessory ossification centers may occur, but fuse by age 20. Therefore accessory ossicles about the navicular may be confidently diagnosed, radiographically, only after age 20. However if the patient is symptomatic prior to this age, examination via ultrasound or MR imaging may evaluate the non-ossified cartilaginous anlage of the os tibiale externum/accessory navicular and, importantly, the relation between the developing os tibiale externum/accessory navicular and the tibialis posterior tendon.

The accessory navicular may coalesce with the navicular via tissue that is fibrovascular or connective in origin.

The accessory ossicles about the navicular have been classified into three variant forms:

- **Type 1** – The ossification center forms a small (typically around 2-3 mm) sesamoid bone within the tibialis posterior. This is considered the true os tibiale externum.
- **Type 2** – the ossification is larger (up to 9-12mm or more), just medial to the navicular bone and a fibrocartilaginous or hyaline synchondrosis connects it to the navicular. Most or all of the tibialis posterior tendon insertion is onto the separate type 2 ossicle and this form is the most frequently symptomatic. This form is termed the accessory navicular.

- **Type 3** – also known as the cornuate navicular, this is essentially a type 2 connected by an osseous bridge, never forming a separate bone and having the radiographic appearance of an unusually prominent navicular tubercle. Symptoms may occur related to an overlying bursitis or tendinitis and this type has been shown, in some cases, to undergo fracture or stress fracture, with non-union, yielding an apparent type 2 accessory navicular.

Clinically the type 2 accessory navicular may be associated with a painful flat foot. There is often a palpable bony irregularity or prominence over the anteromedial aspect of the midfoot, which has been described as being as large as “the size of a walnut.” (2)

Although relatively uncommon, the type 2 accessory navicular may fracture through the fibrocartilaginous union with the parent navicular, usually an avulsive injury with a violent muscle contraction of the tibialis posterior, rather than a direct trauma. (6)
Alternatively repetitive traction may produce multiple microfractures with a forceful contraction of the tendon finally resulting in a sudden, separation, in a type of stress fracture. (7)

Conclusions

An accessory navicular represents one of several accessory ossicles found in the ankle and foot, which may be clinically relevant. The relationship between the accessory navicular and the tibialis posterior tendon is especially important due to the associated tendinopathy that may develop. The radiographic features of an accessory navicular include an osseous fragment situated medial to the navicular, around which soft tissue swelling and/or displacement may be noted. MR imaging is valuable in assessing associated tendon injury and potential disruption of the fibrocartilaginous union, as well as any abnormality from secondary effects on the biomechanics of the ankle and foot.

Clinical Pearls

- Accessory ossicles associated with the navicular may be detectable, clinically, as a “bump” along the anteromedial aspect of the midfoot, which may or may not be painful.
- Patients with accessory ossicles associated with the navicular may present with a painful flat foot deformity and/or foot pronation.
- An accessory navicular is seen, radiographically, as an osseous density medial to the navicular which may be bilateral.
- The accessory navicular may be associated with tendinopathy of the tibialis posterior and symptoms may also arise from repetitive stresses or trauma disrupting the fibrocartilaginous union with the parent navicular.

Useful website

<http://pramodrad.blogspot.com/2009/10/os-tibiale-externun-accessory-navicular.html>

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Abstracts & Literature Review

Cervical spondylosis with spinal cord encroachment: should preventive surgery be recommended?

Murphy DR, Coulis CM, Gerrard JK
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JACO Editorial Reviewer: Anthony V. D'Antoni, MS, DC, PhD

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JACO Editorial Summary:

- The authors of this qualitative systematic review investigated whether the scientific evidence supports or refutes the recommendation that decompression surgery should be done in patients with spondylolytic encroachment on the cervical spinal cord without myelopathy to prevent future spinal cord injury due to minor trauma. There is a paucity of studies on the efficacy of surgery to prevent prospective outcomes. This paper is an excellent example of how a dilemma in clinical practice (ie, how best to advise patients about the risks and benefits of preventive surgery) drove the authors to conduct a systematic review. Consequently, this paper should be very useful to both surgical and non-surgical spine clinicians in clinical practice.
- Out of 1881 citations, the authors retained two papers that met their inclusion criteria. In the abstract under *Results*, it was written that three papers were retrieved when, in fact, there were only two retrieved. Although the design of

both papers was at the lower end of the evidence-based spectrum, the authors acknowledged that more robust studies (such as cohort and case-control studies) are needed to investigate their research questions. Consequently, this study has identified a major gap in the literature.

- The authors concluded that a recommendation for prophylactic decompression surgery in asymptomatic patients is not warranted at this time based on the available evidence. However, keeping with the tenets of evidence-based medicine, the authors remind the readers that clinical decisions should ultimately incorporate evidence with clinical experience and patient values.
- From a conservative viewpoint, spine surgery should only be used when conservative interventions fail or the patient is at risk for immediate catastrophic neurologic deficit. One

must always consider if the benefits of surgery outweigh the risks. Clearly, the literature does not currently support the use of surgery in these patients. As the authors point out, even surgeons have mixed views on the appropriateness of this preventive surgery. The bottom line is clinicians should cautiously advise their patients using these data, and suggest a second surgical opinion for patients convinced that this surgery will be beneficial for them.

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Abstracts & Literature Review

Does Lumbar Facet Arthrosis Precede Disc Degeneration? A Postmortem Study

Jason David Eubanks, MD*; Michael J. Lee, MD†; Ezequiel Cassinelli, MD*; and
Nicholas U. Ahn, MD*

Clinical Orthopedics and Related Research

Number 464, pp. 184–189

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JACO Editorial Summary:

- This research article expands into greater depths of discovery in the stages of the degenerative process of the three joint vertebral complex composed of the intervertebral disc and facets. From the more than 3000 treated and dried specimens contained in the Hamann-Todd Osteological Collection, Cleveland Ohio 647 specimens were chosen. They represent individuals who died in Cleveland between 1893-1938. Included in the study were 475 men and 172 women ranging in age from 17 to 93 years with a nearly bell – shaped distribution of ages for men and a larger proportion of younger ages in the female specimens.
- In the process of studying skeletal lumbar spines for another purpose, it became apparent that some young individuals showed marked facet osteophytosis (FO) in the absence of bony evidence of vertebral rim osteophytosis (VRO). This intriguing finding led the authors to question the commonly held belief that disc degeneration necessarily precedes facet arthrosis. In an era in which disc replacement surgery is being purported to save motion and avert further degeneration and, yet, is contraindicated in the presence of facet arthrosis, this issue has important implications within the orthopedic community.

- A power analysis was performed to determine the number of samples needed to arrive at a significant difference between the incidences of facet and end plate arthrosis. At the time of examination specific attention was not paid to the coexisting presence or absence of spondylolysis nor was the examiner blinded to the age of the specimens. Using a value of $p < 0.05$ and a power of 80%, it was estimated, for a 20% difference between the incidence of facet and end plate arthrosis, a sample size of 91 would be needed.
- Evaluation of FO and VRO using a grading scale ranging from 0 to 4, as suggested in the guidelines presented by Kettler and Wilke. Grade 0 = normal facet joints or vertebral end plates; Grade 1 = mild arthrosis with osteophytic reaction involving as much as 50% of the facet joint or vertebral end plates; Grade 2 = moderate arthrosis with osteophytic reaction involving 50% to 100% of the facet joint or vertebral end plates; Grade 3 = severe arthrosis with osteophytic reaction involving 100% of the facet joints or vertebral end plates with hypertrophic osteophytes bridging the joint space; Grade 4 = complete ankylosis. The right and left facet joints of each lumbar level were graded independently. The prevalence and degree were analyzed using (0-4) of the FO and VRO by decade at each lumbar level using analysis of variance. For every decade examined the prevalence of FO was compared with the prevalence of VRO to determine the predominant, if any, site (facet versus disc) and level (L-1-L2 to L5-S1) of degeneration for any given age category.
- Specimens younger than 30 years had a greater prevalence of FO at the L-1-L2 and L2-L3 levels than corresponding VRO. These level-specific findings stood in contrast to the other age categories in which they observed no differences between FO and VRO at these levels. In the specimens 30 to 39 years of age, and increased prevalence of FO as compared with VRO appeared at L-4-L5. This level specific finding was particular to those specimens in their fourth decade of life when compared with all other age categories.
- Considerable FO, in the absence of VRO, was noted in specimens as young as 21 years. By the fifth decade of life this trend for the early predominance of FO changed and VRO began to outpace FO. Specimens aged 40 to 49, 50 to 59, 60 to 69, and older than 70 years showed more marginal osteophytosis than FO and VRO within age groups closely paralleled one another with the important exception of the findings previously noted at L1-L2 and L2-L3 for the younger than 30 years specimens and the L4-L5 findings in the younger than 40 years specimens. After the comparative early spike in FO, followed by the shift to predominant VRO in the fifth decade, by the sixth decade of life, evidence of arthrosis in the functional units of the lumbar spine was nearly ubiquitous, with overall greater prevalence in the degenerative discs.

Editorial Comment: The commonly held belief that Lumbar disc degeneration precedes facet degeneration has been challenged by this expanded study. At the very least the facets are degenerating simultaneously and not merely after disc degeneration. This opens the door for further expanded investigation using serial imaging and autopsy analysis after death would provide the most satisfactory answers to these questions. However, such a study would be logistically difficult and financially prohibitive. These findings and questions are important to the chiropractic and medical orthopedists in patient evaluation and management along with the development of manual and surgical techniques.

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Abstracts & Literature Review

Standards of Care for Acute and Chronic Musculoskeletal Pain: The Bone and Joint Decade (2000 –2010)

Nicolas E. Walsh, MD, Peter Brooks, MBBS, J. Mieke Hazes, MD, PhD, Rorey M. Walsh, BS, Karsten Dreinhöfer, MD, Anthony D. Woolf, BSc, Kristina Åkesson, MD, PhD, Lars Lidgren, MD, PhD
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JACO Editorial Reviewer: Steven G. Yeomans, DC, FACO

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JACO Editorial Summary:

- The goals of the document are to 1) “to inform health care providers in the management of acute and chronic musculoskeletal [MSK] pain; and 2) to promote partnerships among the community, patients, and clinicians in decision-making in relation to pain – its prevention and management.”
- Three themes are utilized: 1) access to information/self-management; 2) early access to the best services to prevent chronicity; and 3) access to ongoing responsive treatment/support.
- 13 national and international guidelines/standards of care were reviewed to prepare this document.
- Standards of care for acute and chronic musculoskeletal care are included.
- Broad categories included prevention, initial assessment, initial management, follow-up care, rehabilitation, prevention of recurrent MSK pain, and prevention of chronic MSK pain.
- Charts are included utilizing the broad categories (last bullet above) and the goal, standard of care and needs are reported for both acute and chronic MSK care.
- The biopsychosocial model is fully embraced (red flags, yellow flags, occupational flags, and socio-occupational flags).
- A “Management Plan” algorithm is included with 4 main aspects to MSK care that include assess, manage, evaluate and exit.
- Six appendices include: 1) MSK signs & symptoms of serious causes; 2) MSK signs & symptoms of specific causes; 3) Conservative management for MSK pain; 4) Techniques of effective communication; 5) Psychosocial barriers to recovery; 6) predictors of chronicity (non-organic signs).

Abstracts & Literature Review

Accuracy of MRI vs. CT for Evaluating Cervical Spine Facet Arthrosis

Ronald A. Lehman, Jr, MD, Melvin D. Helgeson, MD,* Kathryn A. Keeler, MD, Torphong Bunmaprasert, MD, and K. Daniel Riew, MD
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JACO Editorial Summary:

- This study was a retrospective review of cases over a 14 month period from a spine clinic that sought to determine the accuracy of MRI vs. CT in evaluating cervical spine facet joint arthrosis, a term that was not defined, but presumably synonymous with degenerative facet joint arthropathy.
- Motivation for the study included an earlier report (1) showing that facet arthropathy was a predictor of less favorable outcomes in patients who had received lumbar disc arthroplasties.
- The authors acknowledged that, although evidence exists for the lumbar spine, no similar data exists to indicate that cervical spine facet arthropathy is an important factor in the decision-making process regarding placement of an artificial disc (2,3). The assumption was made that significant facet arthropathy represents a contraindication to placement of cervical, artificial discs, as is the case in the lumbar spine. This presupposition should be tested, prior to a prospective study, to evaluate the importance of facet arthropathy as an exclusion criterion for cervical disc arthroplasty.
- Prior articles have examined the accuracy of various forms of diagnostic imaging in identifying and quantifying facet arthropathy in the spine, with the suggestion that CT is the most accurate method and that radiographs and MRI are less accurate, although with moderate to substantial agreement between MRI and CT or CT myelography in at least some studies. (4-7)
- It should be pointed out that, unlike some of the prior studies that involved only musculoskeletal spine radiologists in the assessment of the facet arthropathy, this retrospective study involved evaluation of imaging by both spine surgeons and radiologists. There was no specification as to not made in a blinded manner, without consideration of clinical information, an obvious potential source of study bias.

- In addition to the retrospective, non-blinded nature of the study, another weakness was that CT (as opposed to surgical findings, for example) was assumed to be the “gold standard” in the diagnosis of facet arthropathy. Although the authors mentioned this, they dismissed it by indicating that, since the surgery for disc arthroplasty involved an anterior approach, it would not be feasible to assess the anatomy and histology of the facet structures, directly.
- While CT may better assess osteophytes, subchondral cysts and sclerosis, it may be inferior to MRI in identifying other findings of arthropathy, including marrow and periarticular soft tissue edema, joint effusions, and synovial cysts.
- The authors also address the potential criticism of the use of spine surgeons as well as radiologists in reviewing imaging findings, noting that the study mimicked the “normal clinical situation.” While this may be true, as mentioned earlier, this draws into question the influence of study bias and of the accuracy of the imaging interpretation when made by non-radiologists or radiologists without subspecialty training in interpretation of spine imaging.
- Finally, it is unclear as to whether or not specific parameters were established prior to the imaging interpretations, with regards to identifying and quantifying the facet arthropathy. It is possible that the reported accuracy of an examination may be influenced not only by the training and experience of the interpreter, but also by the presence or absence of a clearly agreed upon set of parameters used to establish the diagnosis of the abnormality being searched for, prior to the interpretations actually being performed. A prospective, blinded study, addressing these elements would be helpful before one could conclude, on the basis of this study, alone, that CT is essential in the evaluation of a potential candidate for cervical disc arthroplasty.

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Abstracts & Literature Review

Performance-Enhancing Drugs and Today's Athlete: A Growing Concern

Seth A. Cheatham, MD; Robert G. Hosey, MD; Darren L. Johnson, MD
Orthopedics/ORTHOSuperSite.com;2008; 31(10):1014-1017.
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JACO Editorial Reviewer: Joyce Miller, BSc, DC, FACO, FCC

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JACO Editorial Summary:

- The authors did not supply an abstract, only this troubling introduction calling for awareness of this increasingly daunting problem. This article is a short, focused commentary designed to alert clinicians to the growing problem of steroid use among young athletes and to urge their assistance to educate young people on the risks. It is summarized here.
- Epidemiology: Depending on the study, 4-12% of high school boys and 3.3% of girls have used anabolic steroids to enhance performance or recovery from injury. In 9-13 year old children, the rate of usage is 2.7% to 3.8%. Less than 1% of users stated that steroids were hard to get.
- Patterns of use: "Stacking" (the simultaneous use of multiple steroids) and "pyramiding" (increasing the dosage in a cycle) are used to maximize steroid receptor binding. Some also use clomiphen and HCG (human chorionic gonadotropin) to minimize side effects.

Over-the-counter products such as Androstenedione (a precursor to testosterone) and DHEA are commonly used but studies show there is no effect on lean muscle mass or muscular strength. There is concern of virilisation in women and gynecomastia in men after using DHEA.

- Risk Factors: A picture of the most common user has been developed. The user is likely to be male, under-performing in academics and a participant in school athletic programs, especially sports such as football, wrestling, baseball and track and field which require muscle strength and power.
- Adverse Effects: There are 5 categories of adverse effects: hepatic, cardiovascular, reproductive/endocrine, dermatological and psychiatric. Children are the most susceptible to adverse effects with potential elevated lipid profiles, hypertension, cholestasis, hepatic adenomas, severe acne, premature baldness, severe mood changes, early development of secondary sex characteristics and even early closure of growth plates in long bones.

- Conclusion: Health professional who have an understanding of the risks of taking these drugs are in a prime position to educate parents and youngsters in order to decrease the first-time use of these drugs and thus prevent life-long consequences.

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Sjoqvist F, Garle M, Rane A. Use of doping agents, particularly anabolic steroids in sport and society. *Lancet*. 2008; 371(9627):1872-1882.

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Abstracts & Literature Review

Exercises for spine stabilization: motion/motor patterns, stability progressions, and clinical technique.

McGill SM, Karpowicz A.
Arch Phys Med Rehabil. 2009 Jan;90(1):118-26.
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JACO Editorial Reviewer: Jeffrey R. Cates, DC, MS, FACO,DABCC

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JACO Editorial Summary:

- This is an elegant basic science study that highlights the hypothesis that professionally guided exercises can alter muscle activation patterns in a manner that may allow for enhanced exercise efficacy.
- Understanding the therapeutic needs and goals of a patient and the expected therapeutic effects of various exercises is expected to yield positive treatment outcomes.

Announcements

Announcing the new Date for the 2010 ACCO Convention

The 2010 ACCO Convention has been rescheduled April 23-25, 2010. The convention will be held at Harvey's Resort in Lake Tahoe (www.harveystahoe.com).

If you have not attended an ACCO Convention, plan to do so in 2010: for the educational experience; to share in the comradery of fellow like minded practitioners who strive to offer the highest quality of care for their patients; to break away to breathtaking Lake Tahoe.

Refer a colleague and share the wealth of knowledge you gain from the speakers at our convention.



Event Info:

April 23-25, 2010 – Registration - \$425.00

Harvey's Resort, Lake Tahoe www.harveystahoe.com with a Special Group Room Rate of \$129 (reservation code is S04ACCO)



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