Abstracts

Cervical spondyloysis
Poggi JJ, Martinez S, Hardaker Jr, WT, Richardson WJ.
The term cervical spondyloysis describes a long-standing, perhaps congenital defect of the pars interarticularis of a cervical vertebra. We report 10 new cases of cervical spondyloysis and review the literature. All patients in this report were treated nonoperatively with subsequent symptomatic improvement. Cervical spondyloysis must be differentiated from its traumatic counterparts radiographically. Characteristic radiographic findings include well-corticated margins at the defect, a characteristic "bow tie" deformity, and ipsilateral dysplastic facets. Compensatory hypertrophic changes of the adjacent articular processes, spine bifida, and spondylolisthesis are frequently, but not always, seen in conjunction with cervical spondyloysis. The vast majority of patients with radiographically proven cervical spondyloysis can be treated confidently with conservative measures. Surgical intervention should be reserved for those who fail nonoperative management or who exhibit neurologic compromise referable to an unstable spondyloytic defect.

Superselective angiography of a spinal dural arteriovenous fistula having a common segmental origin with the artery of Adamkiewicz
The artery of Adamkiewicz frequently originates from the same radial vessel that also supplies a dural arteriovenous fistula. This variant is not adequately emphasized in the neuroradiological literature. Awareness of this entity is essential to prevent catastrophic complications during embolization. We report such a case, and our experience with attempted embolization. We are unaware of any previously reported instance of such an attempt being made.

Patellofemoral stress - a prospective analysis of exercise treatment in adolescents and adults
O'Neill DB, Micheli LJ, Warner JP.
Thirty patients, 13 skeletally immature individuals and 17 adults, participated in a prospective study designed to evaluate the effects of isometric quadriceps strengthening exercises on patellofemoral pain. Of the 30 patients with anatomically normal lower extremity alignment and no history of previous knee trauma or surgery, there were 34 knees that had a decrease in peripatellar knee pain with a structured exercise program. One additional patient had a decrease in pain after an arthroscopic lateral release and with continued exercises.
An equal number of skeletally immature patients and adults had a decrease in peripatellar knee pain. However, 5 of 17 adults had to limit their activities, while no adolescent patient had to limit activity. Additionally, eight skeletally immature knees had greater than 5° change in their congruence angles, as measured on Merchant tangential radiographs, over the year-long course of this study. Only one adult knee had a similar radiographic improvement.
We recommend immediate action to ameliorate patellofemoral pain syndrome, even when extremity alignment is normal. An isometric, progressive resistance quadriceps program, with illiotibial band and hamstring stretching exercises, is the preferred initial treatment.

Bilateral occipital lobe infarction in acute migraine: clinical, neurophysiological, and neuroradiological study
A woman having common migraine attacks coincident with an asymmetrical bilateral occipital lobe infarction that spared the brainstem and cerebellum underwent these studies: serial electroencephalography, brainstem auditory, visual and somatosensory evoked potentials, magnetic resonance imaging of the brain and cerebral arteriography. The patient's vision improved greatly during a one-year follow-up. The absence of risk factors for stroke suggested that migraine caused the infarction in the posterior circulation network. The pathophysiological mechanisms of stroke in migraine remains speculative.

Ethics, scientific validity, and the design of epidemiologic studies
Ethical conflicts between moral principles and methodologic standards sometimes occur in epidemiologic research. When dilemmas are discerned, they may be analyzed using the ethical principles of beneficence, nonmaleficence, justice, and respect for the autonomy of persons. We argue that, in addition to scientific validity, the welfare and rights of research subjects should be taken into account in making decisions regarding all aspects of the design and conduct of epidemiologic studies, and that the commitment of epidemiologists to the advancement of scientific knowledge should not outweigh or override all other considerations.

Non-invasive assessment of the Circle of Willis using transcranial pulsed Doppler ultrasound with angiographic correlation
Chaudhuri R, Padayachee TS, Lewis RR, Gosling RG, Cox TCS.
The ability of transcranial pulsed Doppler ultrasound (TCD) to provide a dynamic assessment of the functional capability of the Circle of Willis was assessed using conventional cerebral angiography for anatomic correlation.
Eleven patients had normal four-vessel cerebral angiography prior to being investigated with ultrasound. Angiography and ultrasound both demonstrated a functional anterior communicating artery in nine of the
eleven patients, giving complete agreement between the two techniques. Posterior communicating arteries were visualized angiographically in all eleven patients. Ultrasound identified bilateral functional vessels in nine, the other two patients having nonfunctional vessels. In these latter two patients, angiography demonstrated three of the four posterior communicating arteries to be hypoplastic and it was uncertain whether these vessels carried significant blood flow. The fourth posterior communicating artery was shown to have an absent proximal segment of the ipsilateral posterior cerebral artery, with a persistent fetal posterior communicating artery. This anatomic variation is a potential limitation of ultrasound for assessing functional posterior communicating arteries.

These preliminary results indicate that a combination of the anatomic (angiographic) and dynamic (ultrasonic) data may prove to be complementary for assessing the Circle of Willis.

Pseudoenhancement of intervertebral disc herniation


Two patients with intervertebral disc herniation appeared to demonstrate abnormally diffuse and intense enhancement of the disc after intravenous administration of gadolinium-DTPA for MRI. Surgery disclosed a dilated epidural venous plexus in one and vascular granulation tissue in the other, associated with the herniated disc material. The mechanism of this “pseudoenhancement” of the disc appears to be a partial volume effect of disc material and the adjacent vessels or granulation tissue. Pseudoenhancement of a herniated disc should be included in the differential diagnosis of a diffusely enhancing epidural mass.

Detection of Mycobacterium tuberculosis antigen in synovial fluid of patients with rheumatoid arthritis


By use of antinmycobacterial saline extract antibodies, Mycobacterium tuberculosis (MT) antigens have been detected in synovial fluid (SF) of patients with rheumatoid arthritis (RA) by a highly specific and sensitive double-antibody sandwich enzyme-linked immunosorbent assay (ELISA). Absorbance for 15 gout, 14 osteoarthritis (OA) patients, 12 patients with spondylarthropathies (SA) and eight patients with other inflammatory disorders (OID) ranged from 0.001 to 0.025 with the mean values of 0.008 ± 0.0078, 0.0077 ± 0.0051, 0.0069 ± 0.0059 and 0.0113 ± 0.0059, respectively. Among 65 SF of patients with RA examined, 34 were found to be negative for MT antigen with absorbance ranging from 0.002 to 0.024 and a mean value of 0.0114 ± 0.0070. For 31 (47.7%) MT antigen-positive specimens of RA, optical density ranged from 0.052 to 2.446 with a mean value of 0.564 ± 0.7534. Significant statistical differences (P < 0.05) was found when MT antigen positives were compared with MT antigen negatives, gout, OA, SA and OID groups. Our results indicate that MT may be relevant to the pathogenesis of RA.

Dissection of cranial arteries in the neck: correlation of MRI and arteriography


Retrospective correlation of MRI and angiographic findings in nine patients with suspected cerebral vascular dissections revealed MRI evidence of vessel abnormalities in eight patients, seven of whom proved to have arterial dissections. One patient whose MRI showed no abnormalities also proved to have a dissection, shown by angiography. Two patients had associated pseudoaneurysms not demonstrated by MRI. Five dissections involved the carotid arteries and three the vertebral arteries. Seven of the nine patients had associated transient neurologic deficits, while two had permanent deficits. Frank infarction of the brain was demonstrated by MRI in five cases. MRI findings suggestive of dissection included: (1) increased signal from the entire vessel; (2) a border of increased signal surrounding the lumen, with luminal narrowing; (3) poor or absent visualization of the vessel; and (4) significant compromise of the vessel lumen by adjacent abnormal increased signal tissue.

Measuring the functional impact of fibromyalgia


Fibromyalgia has a significant impact on function, especially to work, yet patients with fibromyalgia seldom can collect disability payments and often are not even recognized as having a disease. The reason is that the symptoms – pain and fatigue – are almost impossible to measure: also, the only objective finding in fibromyalgia is the tender point count, and severity of tenderness is not readily measured. However, health status instruments are being developed that will help legitimate fibromyalgia as a disease and some fibromyalgia patients as being disabled. The Arthritis Measurement Scale measures physical, emotional, and social health of patients with rheumatic diseases. An adaptation, the Fibromyalgia Impact Assessment, may help document the presence of fibromyalgia and verify disability.

Estimation of normal lumbar flexion with surface inclinometry: a comparison of three methods


The purpose of this study was to determine the magnitude and clinical significance of surface measurement error in the determination of lumbar spinal flexion. Intra-rater, inter-rater and intermethod reliability estimates were obtained using single inclinometry, double inclinometry and back range-of-motion inclinometry methods. Eight healthy subjects were examined independently by two experienced observers and three replicates of each measurement were obtained by each observer in a random sequence. In addition, three replicates of lumbar flexion angles were obtained for each subject by a single observer using the B-200. Reliability estimates were determined by intraclass correlation coeffi-
Duplicated origin of right vertebral artery with rudimentary and accessory left vertebral arteries


We observed a rare cerebrovascular anomaly in a patient with brain-stem infarction. Two right vertebral arteries arose from the subclavian artery and communicated directly with each other under the transverse foramen of the fourth cervical vertebra. The left vertebral artery consisted of a rudimentary artery that arose from the left subclavian artery, ran through the transverse foramen of the sixth cervical vertebra and then tapered down to disappear at the fourth/fifth cervical vertebrae, plus a second, accessory artery that arose from a branch of the left thyrocervical trunk, ran through the transverse foramen of the fifth cervical vertebra and tapered off to disappear at the first/second cervical vertebrae.

Cuboid subluxation in ballet dancers


Cuboid subluxation is a common but poorly recognized condition. Its symptoms include lateral midfoot pain and an inability to "work through the foot". In addition, pressing on the plantar surface of the cuboid in a dorsal direction produces pain. The normal dorsal/plantar joint play is reduced or absent when compared to the uninjured side, and subtle forefoot valgus is present. Frequently, there is a shallow depression on the dorsal surface of the foot and palpable fullness on the plantar aspect of the cuboid. Documentation by radiograph, CT scan, or magnetic resonance imaging is difficult because of the normal variations found in the relationship between the cuboid and its surrounding structures. The diagnosis is primarily subjective, and must be made on the basis of the patient's history and physical findings. Treatment requires recognition of the condition, manual reduction by a therapist or physician familiar with the condition, and followup to be certain that the cuboid remains in place. Therapists and orthopaedists involved in the care of dancers should be alert to the possibility of cuboid subluxation and be able to recognize it when it occurs.

Bilateral persistent trigeminal arteries presenting with brain-stem infarction


A 43-year-old male with a left hemiparesis due to brain-stem infarction associated with bilateral persistent trigeminal arteries is reported. The clinicopathological and radiographic significance of persistent carotid-basilar arterial anastomoses in vertebrobasilar territory ischaemic attacks is also discussed.

EMG analysis of the scapular muscles during a shoulder rehabilitation program


The purpose of this study was to determine which exercises most effectively use the scapular muscles. Eight muscles in 9 healthy subjects were studied with indwelling electromyographic electrodes and cinematography while performing 16 exercises. The 8 muscles studied were the upper, middle, and lower trapezius; levator scapula; rhomboids; pectoralis minor; and the middle and lower serratus anterior. Each exercise was divided into areas of motion and the electromyographic activity was quantified as a percentage of the maximal manual muscle test. The optimal exercises for each muscle were identified based on intensity (greater than 50% maximal manual muscle test) and duration (over at least 3 consecutive arcs of motion) of the muscle activity. Twelve of the exercises qualified as top exercises for all of the muscles. On further analysis, a group of 4 exercises was shown to make up the core of a scapular muscle strengthening program. Those 4 exercises include scaption (scapular plane elevation), rowsing, push-up with a plus, and press-up.

A comparative study of the anatomical, radiological and therapeutic features of the lumbar facet joints


An anatomical study of the lumbar apophyseal joints was carried out to facilitate recognition of facet joint lesions, which we now examine routinely by percutaneous arthrography. Special attention was given to the configuration of the different compartments of the joint space and to its relationships with the contents of the intervertebral foramen. The abnormalities seen on lumbar facet joint arthrography are varied; two major groups should be stressed: synovial fring hypertrophy and pseudodiverticular synovial ectasia. The percutaneous approach to lumbar facet joint arthrography allows it to be used a therapeutic measure, with injection of anti-inflammatory drugs into the joint space, the beneficial effects of which were confirmed in our series. The precision, efficiency and cost-effectiveness of this outpatient technique justify and should encourage its more widespread application in the diagnosis and treatment of low back pain.
Subclavian steal phenomenon: a correlation between duplex sonographic and angiographic findings

Yip PK, Lui HM, Hwang BS, Chen RC.

Correlation of duplex sonography, angiography of the vertebral artery, and the degree of subclavian or innominate stenosis was carried out in ten patients with the subclavian steal phenomenon. Four successive stages of Doppler waveform were identified by duplex sonography. Three angiography patterns of decreasing severity, permanent reversal, to-and-fro motion and delayed opacification, were found. Permanent reversal angiograms corresponded to complete reversal or late transient Doppler waveforms. To-and-fro motion and delayed opacification angiograms did not necessarily have a corresponding Doppler pattern. The different stages of subclavian steal phenomenon duplex sonography correlated significantly with the degree of subclavian or innominate stenosis. Stenosis of at least 60% was found to produce abnormal vertebral artery Doppler sonography, except in one patient. Duplex sonography is considered to be a sensitive and convenient method for detecting abnormal vertebral artery haemodynamics and the subclavian steal phenomenon, but some other factors may be important in producing the Doppler waveforms.

Injuries in adolescent and preadolescent boys at two large wrestling tournaments

Lorish TR, Rizzo TD, Istrup DM, Scott SG.

We evaluated injury patterns at two wrestling tournaments involving 1742 participants, aged 6 to 16 years. The overall injury rate was 12.7%. Injuries requiring withdrawal from the tournament occurred in 4.6% of the participants. Of all participants, 3% sustained an injury in their first match, and 1.1% sustained an injury during their first match that required withdrawal from the tournament. Primary areas of injury were the upper extremity (33%) and the neck and back (24%). Wilcoxon rank-sum tests revealed that increasing age and increasing weight were correlated with injury, whereas multiple logistic regression analysis revealed that only increasing age was correlated with injury. These findings suggest the need for medical supervision at large wrestling tournaments, where it is likely that severe injuries will occur. In addition, older wrestlers and perhaps heavier wrestlers are at an increased risk for injury.

Tortuous vertebral artery shown by MR and CT


Tortuosity of the vertebral artery is an uncommon cause of symptoms that can lead to imaging evaluation. We describe a patient with pain in the neck and retroauricular area in whom the diagnosis of a tortuous vertebral artery was suggested by results of both MR and contrast-enhanced CT and was confirmed by arteriography. The patient underwent a foraminotomy, which alleviated the pain.

Unilateral upper cervical posterior spinal artery syndrome following sneezing

Gutowski NJ, Murphy RP, Beale DJ.

A 35-year-old man experienced severe transitory neck pain following a violent sneeze. This was followed by neurological symptoms and signs indicating a left sided upper cervical cord lesion. MRI showed an infarct at this site in the territory of the left posterior spinal artery. This discrete infarct was probably due to partial left vertebral artery dissection secondary to sneezing.

Paraplegia due to a ruptured aneurysm of the distal posterior inferior cerebellar artery

Kashiwagi S, Tsuchida E, Shinoyama Y, Ito H, Yamashita T.

A case of paraplegia was due to a ruptured aneurysm of the distal posterior inferior cerebellar artery. The paraplegia was caused by a unilateral lesion located between the cervicomедullary junction and the C2 level, where it involved both crossed and uncrossed pyramidal fibres projecting to the lower extremities. Since a vascular lesion near the cervicomедullary junction is likely to be missed, special attention should be paid to this region when investigating subarachnoid haemorrhage with paraplegia.

Lupus-related myelopathy: report of three cases and review of the literature

Proenzczale J, Bouldin TW.

Transverse myelopathy is an uncommon complication of systemic lupus erythematosus (SLE). Three patients with SLE are reported who developed transverse myelopathy, including the pathological findings in one patient on whom necropsy was performed. Paraparesis was present in all three cases, but definite sensory changes were present in only one patient. In two patients, the CSF findings were remarkable for elevated protein and depressed glucose concentrations. Microscopic examination of the brain demonstrated small, scattered foci of recent necrosis consistent with microinfarctions. Striking abnormalities were found in the spinal cord at all levels, including multiple foci of vascular spongy degeneration in the peripheral white matter, as well as ballooning of myelin sheaths, swollen axons, myelin pallor, and loss of glial nuclei. The pathological findings in previously reported cases of SLE-related transverse myelopathy are reviewed, and the possible pathogenesis of the findings in our case are discussed.