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e-Journal

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Original Articles

Reprints

The American College of Physicians and the American Pain Society Low Back Pain Guidelines

The March/April, 2008 issue of the North Carolina Medical Journal included a letter to the editor written by the Academy of Chiropractic Orthopedists' executive board member, James Demetrious, DC, FACO. The letter was published in the Reader's Forum section of the journal and is accessible online at: <http://www.ncmedicaljournal.com/>. The NCMJ is important as it reportedly is distributed to ~30,000 medical practitioners, policymakers and educators.

In the consensus document published in the *Annals of Internal Medicine* (*Ann Intern Med.* 2007;147:478-491.), specific guidelines for the care of low back pain were established based upon an a comprehensive systematic review of the literature.

Spinal manipulative therapy was the only reported non-pharmacologic, non-invasive protocol of care that was recommended for acute low back pain as a guideline by the American College of Physicians and the American Pain Society. In addition, the consensus panel also indicated that SMT is recommended for sub-acute and chronic pain.

Dr. Demetrious discussed these issues and called for improved medical/chiropractic collegiality and inter-professional referral based upon this landmark evidence-based consensus document.

Osteochondritis Dissecans: The clinical value of two observed signs

Drost, W.C.

Osteochondritis dissecans (OCD) is a term used to describe a partial or complete separation of an articular cartilage and subchondral bone segment due to avascular necrosis. Maximum incidence is between the ages of 10 and 20 years. It is found more frequently in children who are athletes and is twice as common in boys as it is in girls. This condition most commonly affects the knee joint, with approximately 85% of lesions occurring in the medial femoral condyle and 15% of lesions occurring in the lateral femoral condyle (Aichroth 1971). Although osteochondritis dissecans can resolve by itself failure, to recognize this condition can lead to long-term disability.

Case report

A young fit 10 year old boy and his mother visited our teaching clinic complaining of right lateral knee pain. The pain started 10 weeks previously, and was initially felt at the anterior aspect of his right knee. His GP suggested the pain could be due to his rapid growth. Two weeks later the anterior knee pain resolved completely until 1½ weeks prior to presentation, when it returned laterally. The boy described the pain as intermittent, deep and of a tight/pulling character, sometimes stabbing.

The patient is a very active young boy. He plays rugby twice a week and attends a local running club once a week. He could not recall any trauma to the knee, furthermore, he reported stiffness in the thoracic-lumbar region, which had started 5 days prior to this appointment and was experienced especially with bending forward.

On observation an anterior pelvic tilt (lower cross syndrome) and increased toe-out sign of the right foot in comparison to the left was noted (fig. 1).

A physical examination revealed tightness of the musculature associated with the lower cross syndrome. Flexion of the right knee was restricted and associated with pain at the anterior aspect of the knee. Further examination of the right knee could not clearly reproduce his pain. Orthopaedic tests, including Wilson's test for OCD of the medial epicondyle of the knee, were found to be negative. At the time, these findings did not justify the obtaining of radiographs. Treatment was, therefore, focused on the lower cross syndrome, which relieved the knee pain.

Two weeks into the treatment the patient presented at the local hospital and OCD of the medial epicondyle of the right knee was diagnosed by plain radiography.



Fig. 1 Toe-out sign

Formulating the question

Initial symptoms in patients with OCD may be vague, and clinical findings will vary according to the site and status (size, stability) of the lesion. Final confirmation of OCD is made by radiographs or CT-scans. However, clinical examinations should reveal clear signs to justify radiographic imaging.

Wilson (1967) described an orthopaedic test, commonly known as the Wilson's sign, that is used when OCD of the medial epicondyle is suspected. He examined five children with OCD of the medial femoral condyles and observed that these children presented with an external rotated tibia on the affected side. Wilson assumed that impingement of the tibial eminence on the osteochondritic lesion caused pain, which would be relieved by external rotation of the tibia since this prevents this contact. He described a clinical test, whereby the patient's

pain is reproduced by internal tibial rotation during knee extension between 90° and 30° of flexion and that pain would be relieved by external rotation.

As our patient presented with a negative Wilson's sign, but a positive toe-out sign, we posed the following clinical questions:

1) Is Wilson's sign a valuable diagnostic tool to raise the suspicion of OCD?

Table 1

Citation	Study type	Study group	Wilson's sign	
			Positive	Negative
AICHROTH (1971)	A Clinical Survey	100 patients with osteochondritis dissecans of the femoral condyles	7	-
CONRAD and STANITSKI (2003)	Retrospective clinical and radiographic case analysis	17 juvenile patients (age 9 to 12)	4 (23.5%)	13 (76.5%)
		15 adolescent patients (age 13 to 17)	4 (26.7%)	11 (73.3%)

2) Is external tibial torsion (toe-out sign) useful sign in the diagnosis of OCD?

Search procedure

Medical database PubMed was searched with the keywords: *osteochondritis dissecans of the adolescent knee AND physical exam*. This resulted in 24 hits, of which 3 articles were relevant. Further search with the keywords: *tibial torsion AND knee pathology*, produced 15 hits, of which another 3 articles were relevant. The search was limited to English papers only. The Cochrane library and the Index for Chiropractic Literature (ICL) did not give any valuable articles. A hand search yielded 2 further articles.

The evidence

Wilson's sign

Aichroth (1971) published a clinical survey in which a total of 105 patients with OCD were interviewed and examined over a period of eighteen years. Five of those had a lesion of the patella, whereas the majority (100 participants) presented lesions of the femoral condyles. He observed that seventeen patients walked with an externally rotated tibia in opposition to the femur in the affected limb. Although Wilson's sign was positive in seven patients, in two of those the lesion was on the lateral, not on the medial condyle. The author acknowledged that the explanation for this was difficult to determine.

However, Conrad and Stanitski (2003) revisited the Wilson's sign. Over a 2-year period they reviewed the clinical and radiographic records of 32 patients with classic unilateral OCD at the medial femoral condyle.

Table 2

Citation	Study type	Study group	Mean tibial torsion	
			OCD	Control
BRAMER <i>et al</i> (2004)	Retrospective review	23 patients with osteochondritis dissecans were scanned (CT) to determine femoral and tibial torsion		
		20 medial epicondyle lesions	51°	36.2°
		3 lateral epicondyle lesions	40.7°	
TURNER and SMILLIE (1981)	Retrospective review	On 38 patients with osteochondritis dissecans, tibial torsion was measured with a tropometer and compared with a control group	23°	19°
TURNER (1994)	Republished (TURNER and SMILLIE, 1981)		(4.7 SD)	(SD 4.8°)

Patients were divided into a juvenile (aged 9-12) and adolescent (aged 13-17) group, and Wilson's sign was recorded as positive or negative at initial and subsequent visits. To correlate Wilson's statement that his sign was not useful for lesions of the lateral femoral condyle, Conrad and Stanitski also reviewed six cases of lateral femoral condyle OCD. They found that 4 of the 17 patients of the juvenile group (23.5%) and 4 of the 15 adolescent patients (26.7%) had a positive sign at the time of their initial visit (Table 1). Furthermore, they discovered that 2 participants of the six-patient subgroup with lateral femoral OCD had no pain and 4 patients with loose osteochondral fragments experienced pain on internal and external rotation. No further information was given concerning this group. Those authors concluded that Wilson's sign was not helpful as a diagnostic or therapeutic finding in patients with lateral femoral OCD and found the sign overall to be of minimal clinical diagnostic value.

Tibial extorsion

Turner and Smillie (1981) and Turner (1994) measured the tibial torsion in 836 patients of 11 diagnostic categories within an adult knee clinic comparing the measurements with those of a control group. Torsion was measured with a tropometer. They found increased tibial extorsion in the OCD group.

Average external torsion in the control group was 19° (SD 4.8°). Three of the 11 diagnostic categories differed markedly from the controls with significant readings outside the normal range. Those patients with unstable patellofemoral joints had an average external torsion reading of 24.5° (SD 6.3°), with more than 50% of the readings above the normal range. Patients with Osgood Schlatter's disorder also exhibited increased external torsion. They measured an average of 25° (SD 7°) external torsion with 47% of the readings above the normal range. The OCD group, consisting of 38 patients, displayed an average external torsion of 23° (SD 4.7°); with 21% of the readings above the normal range (Table 2).

Bramer et al. (2004) used Computed Tomography (CT) to measure femoral and tibial torsion of 23 patients with OCD. As a control they used the mean value of 36.2° (SD 6.6°) published by Butler-Manuel et al. (1992). In total 20 patients with lesions of the medial condyle were found to have a mean tibial extorsion of 51.0° (SD 7.9°) and 3 patients with lesions of the lateral condyle were found to have a mean tibial extorsion of 40.7° (SD 4.2°).

Applying the evidence

Wilson (1967) described on the basis of surgical observations that during neutral or internal rotation of the tibia, the anterior cruciate ligament (ACL) as well as the tibial eminence could apply pressure on the lesion and therefore, produce pain. Consequently external rotation of the tibia would "unscrew" the ACL and PCL and minimise tibial eminence contact possibly relieving the pressure of the medial epicondyle and with it the pain.

Aichroth, who interviewed and examined patients over a period of 18 years before publishing his paper in 1971, stated that only 7 patients presented with a positive Wilson sign. Wilson however, described and published his sign only four years earlier in 1967. The question arises whether the rest of the 100 patients included in Aichroth's study underwent the identical test described by Wilson in 1967.

Although Conrad and Stanitski (2003) drew on just 32 patients in their study, the results showed Wilson's sign to be of minimal clinical diagnostic value. In addition, based on Wilson's theory, the test is not applicable for lateral epicondyle lesions.

As clinicians we refer to our anatomical knowledge and utilise orthopaedic tests to provoke or relieve a patient's pain, which enables us to exclude or confirm certain pathologies. As the Wilson's sign is the only described orthopaedic test for OCD of the knee and found to be unreliable, it is crucial to take a thorough

history and observation of the patient, to gain suspicion of this condition and to decide to examine the knee radiographically.

Tibial torsion is described as the angle between the transverse axes of the proximal and distal tibial articular surfaces. Normal tibial torsion has been measured in many different ways and even the CT scan technique, which is considered the “gold standard” is somewhat inconsistent when executed by different researchers (Liu *et al* 2005). As clinicians, however, we observe the patient’s stance and gait. Tibial torsion is difficult to observe with the naked eye, but increased external tibial torsion could indirectly result in a toe-out sign when observing the patient (fig 1).

The studies completed by Turner and Smillie (1981) as well as Bramer *et al* (2004) showed an increased external tibial torsion by patients with OCD compared to a control group. Although there are different pathologies associated with tibial torsion (Turner and Smillie, 1981) and indirect toeing-in or out, the observation of a difference in the patient’s affected leg whilst standing or walking, is an important sign to consider possible pathologies of the ankle, knee (including OCD) and the hip.

Clinical bottom line:

- The evidence implies that Wilson’s sign is of minimal clinical diagnostic value.
- The evidence suggests that patients with OCD of the medial epicondyle of the knee present with an increased external tibial torsion, which indirectly could be observed as a toe-out sign in the patient and should encourage the clinician to consider radiographic imaging in order to confirm or exclude the diagnosis.

References:

1. AICHROTH, P., (1971). Osteochondritis dissecans of the knee. A clinical survey. Journal of Bone and Joint Surgery British Volume. 53(3):440-7.
2. BRAMER, J.A., MAAS, M., DALLINGA, R.J., te SLAA, R.L., VERGROESEN, D.A., (2004). Increased external tibial torsion and osteochondritis dissecans of the knee. Clinical Orthopaedics and Related Research. (422):175-9.
3. BUTLER-MANUEL, P.A., GUY, R.L., HEATLEY, F.W., (1992). Measurement of tibial torsion: A new technique applicable to ultrasonography and computed tomography. British Journal of Radiology. 65:119-126.
4. CONRAD, J.M., STANITSKI, C.L. (2003). Osteochondritis dissecans: Wilson’s sign revisited. American Journal of Sports Medicine. 31(5):777-8.
5. LIU, X., KIM, W., DRERUP, B., MAHADEV, A., (2005). Tibial torsion measurement by surface curvature. Clinical biomechanics (Bristol, Avon). 20(4):443-50.
6. TURNER, M.S., (1994). The association between tibial torsion and knee joint pathology. Clinical Orthopedic Related Research. (302):47-51.
7. TURNER, M.S., SMILLIE, I.S. (1981). The effect of tibial torsion on the pathology of the knee. Journal of Bone and joint Surgery. British Volume. 63-B(3):396-8.
8. WILSON, J.N., (1967). A diagnostic sign in osteochondritis DISSECANS OF THE KNEE. Journal of Bone and Joint Surgery American Volume. 49(3):477-80.

Abstracts & Literature Review

Case History

Solitary Osteochondroma At The Knee – A Case Report by Rick Corbett, DABCO, DACBR

Case Presentation

Chief Complaint

An 18 year old chef presented with pain at the left knee following a “slip and heavy fall” on a wet floor.

The patient reported moderate “hurting and stiffness” at the left knee, and as well that the left knee clicked since the injury. Knee flexion was reported as an aggravator. No relievers were identified.

Clinical Examination:

On attempting a deep knee bend, the patient reported soreness and tightness within the left knee joint. On passive movement, there was very mild restriction on flexion. Extension was full in range. Patello-femoral tests were negative. Medial collateral ligament stability test was negative. Lateral collateral ligament stability test was slightly positive on the left. Noble Compression test was equivocally positive on the left. Anterior and posterior cruciate stability tests were negative. Tests for the menisci were negative.

Clinical Impression:

Clinical impression was: sprain/contusion of the left knee, with a small effusion; rule out fracture.

Imaging:

A/P (see Image 1) and lateral (see Image 2) radiographs were taken of the left knee.

Imaging Report

There is a flat, asymmetric, plateau-like, broad-based protuberance at the left distal lateral femoral metaphysis. The cortex and spongiosa of the lesion blend with the metaphyseal bone. There is no stalk.

Impression:

Osteochondroma (solitary) of the sessile type at the left distal femoral metaphysis.

Discussion:

An osteochondroma is a bony exostosis extending from the cortex of a bone. Its cortex and medullary regions are continuous with that of the bone from which it projects.⁵

Pathological features

Two types exist:⁷

- 1) Sessile: These have a very broad flat base, and no stalk. They are common in the humerus and scapula.
- 2) Pedunculated: These have a long stalk attaching the tumor to the host bone. They have a cap of hyaline cartilage which frequently calcifies. They are common in the knee, hip, and ankle.

The pedunculated type projects away from the joint due to muscular pull. Very large lesions are termed "cauliflower" exostoses.²

Incidence

The osteochondroma is a relatively frequent lesion.⁵ It represents 50 percent of all benign bone tumors, 10-15 percent of all primary bone tumors, and is the most common benign skeletal growth or tumor.⁷

Male:Female Ratio

The literature differs in regards to sexual predilection, varying from no difference, to a 2:1 male:female ratio.³

Time Of Appearance

They can be present at birth, and continue to appear and grow throughout childhood and into puberty.⁶

Age At Discovery

Seventy-five percent of osteochondromas occur before age 20, but may not be discovered until later in life, when found incidentally during radiographic examination for other conditions. ²

Etiology

Osteochondromas are developmental lesions rather than true neoplasms. ⁶

It can be considered a congenital anomaly since it develops by the growth of an aberrant foci of cartilage on the surface of bone. ³

Enchondral Bone:

These tumors may occur on any bone in which endochondral ossification takes place. ³

Location

The osteochondroma can be located in the metaphysis or diaphysis; it is never in the epiphysis.

It typically involves the long tubular bones, with the femur (34% of cases), humerus (18%) and tibia (15%) being most common. ²

They are most often found at the metaphyseal or meta-diaphyseal region around the knee joint. ¹

The small bones of the hand and foot are involved in approximately 10 percent of cases. ⁵

Other bones may include the pelvis (8%), scapula (5%) and ribs (3%). ²

The innominate bone is involved in approximately 5% of cases. ⁵

Spinal involvement occurs in less than 2% of cases. Vertebral osteochondromas predominate in the posterior osseous elements. ⁵ Lesions in the spine are usually located close to the secondary centers of ossification and the tips of the transverse processes, spinous processes, laminae and costovertebral joints. ²

Osteochondromas of the cranial bones usually affect the base of the skull. ⁵

Natural History

The growth of an osteochondroma parallels the growth of the patient, and often becomes quiescent when the epiphyses have closed. ³

Osteochondromas that continue to enlarge after puberty must be evaluated carefully for the possibility of malignant transformation. ⁵

Clinical Features

The majority of solitary osteochondromas are discovered in children and adolescents. ⁵

Most are asymptomatic, unless they disturb surrounding blood vessels or nerves.

The most frequent complaint is a painless, slow growing, hard mass near a joint. ^{5, 7}

Pain or an increase in size may be an indicator of other conditions, such as involvement of a bursa overlying the stalk, fracture of the stalk or direct pressure on adjacent nerves or blood vessels. ²

Complications

Potential complications of an osteochondroma (or multiple exostoses) include: fracture, osseous deformity, vascular injury, neurologic compromise, bursa formation, obstructive uropathy, and malignant transformation.^{4, 5}

Malignant Degeneration

Malignant degeneration is more common in patients with multiple osteochondroma (27.3%), as opposed to the solitary form (3.2%).³

Malignant degeneration appears around 30 years of age.⁷

If malignant transformation occurs, the majority of cases degenerate to chondrosarcoma; however, some degenerate into fibrosarcoma or osteosarcoma.²

Irregularity, thickening (greater than 2 cm.), and cystic change of the cap, especially in adults, increases the likelihood of secondary chondrosarcoma.³

Osteochondromas closest to the axial skeleton are more frequently involved with malignant degeneration, especially those in the regions of the pelvis and shoulder.²

Size

Osteochondromas are quite variable in size, with some reaching 10 cm.^{7, 4}

The average size of osteochondromas arising in the long tubular bones is approximately 4 cm (in maximum dimension), whereas those occurring in the flat or irregular bones are usually larger.⁵

Cartilage Cap

There is usually a hyaline cartilaginous cap covering the distal portion of the exostosis, although this cap can be absent.²

In children and adolescents, in whom there is an active growth, the cap may be as thick as 3 cm. In adults, the cap may be entirely absent.

The cartilaginous cap may cover the entire external surface of a sessile tumor, but only the rounded end of a stalked exostosis.

The cartilaginous cap involutes after the osteochondroma ceases to grow, and may even disappear entirely.³

Radiological Features

An osteocartilaginous exostosis is characterized radiographically by an osseous protuberance arising from the external surface of a long tubular bone, containing spongiosa and cortex that are continuous with those of the parent bone.^{5, 4} This is a key radiological feature.^{7, 5}

Sessile osteochondromas appear as an asymmetrical bump lacking a stalk and having a broad-based attachment.

Pedunculated lesions appear as lobulated “cauliflower” masses with a dense, amorphous calcified cap.⁷

Irregular zones of calcification may be present especially in the cap, but extensive calcification with consequent irregularity of the cap should arouse suspicion of malignant change.³

Because they commonly occur in the metaphysis at osseous sites of tendinous or ligamentous attachment, solitary osteochondromas typically point away from the nearby joint.⁵

Gross Pathologic Features

Gross pathologic features include continuity of cortex and periosteum between tumor and underlying bone.

The marrow of the tumor may be fatty or hematopoietic, often mirroring the status of the spongiosa of the underlying bone.³

Histology

When sectioned, the usual osteochondroma is found to contain a cartilaginous cap beneath which is cancellous bone that is in direct continuity with that of the parent bone.⁵

Histologically, [the cap of the] osteochondroma resembles the normal epiphyseal - physeal growth plate.⁷

Differential Diagnosis

The radiographic features of a solitary osteochondroma usually are easily differentiated from findings associated with an osteoma, osteophyte, enthesophyte, herotrophic ossification, and parosteal osteosarcoma.

The major difficulty in differential diagnosis arises in distinguishing between a benign osteochondroma and a peripheral chondrosarcoma⁵, but that is beyond the scope of this case report.

Management and Prognosis

No treatment is necessary in most cases since the lesions are clinically silent.

Symptomatic, large lesions are effectively treated by surgical excision.⁷

Surgical Excision

Surgical removal is indicated if the tumor is unsightly, produces pain or disability, has radiographic features suggestive of malignancy, or shows abnormal increase in size.³

Lee feels that pelvic osteochondromas should be surgically removed since the pelvis is the most common location for chondrosarcoma to occur.²

References

1. Argin M, et al, Solitary osteochondroma causing a popliteal pseudoaneurysm that presented as a mass lesion, Diagn Interv Radiol 2007; 13:190-192.
2. Bogar WC, Osteochondroma of the knee, Journal of Manipulative and Physiological Therapeutics, Vol 16, No 4, May 1993, pp. 253-55.
3. Greger G, Catanzariti AR, Osteochondroma: review of the literature and case report, The Journal of Foot Surgery, Vol 31, No 3, 1992, pp. 298-300.
4. Putman Charles E, Ravin Carl E, Textbook of Diagnostic Imaging, WB Saunders, 1988 Vol 3, pp. 1615-8.
5. Resnick Donald L, Bone and Joint Imaging, WB Saunders, 1989, pp. 1132-5.
6. Saglik Y, et al, Manifestations and management of osteochondromas: a retrospective analysis of 382 patients, Acta Orthopaedica Belgica, Vol 72 – 6 – 2006, pp. 748-55.
7. Yochum Terry R, Rowe Lindsay J, Essentials of Skeletal Radiology, Williams and Wilkins, 1987, Vol 2, pp. 786-92.

Image 1



Image 2



Clinical Pearl

Functional Lumbar Stenosis due to Posterior Lumbar Interbody Fusion

James Demetrious, DC, FACO^{1,2,3,4,5}

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² Academy of Chiropractic Orthopedist's eJournal - Original Articles Editor

³ Post-Graduate Faculty – New York Chiropractic College

⁴ RJM Conference Group – Senior Lecturer

⁵ Private Practice - Wilmington, NC

The following images depict functional lumbar canal stenosis that is adjacent to a posterior lumbar interbody fusion (PLIF). Adjacent segment degenerative changes produced posture dependent intrusion and stenosis within the central canal.

The lateral lumbar myelographic view in neutral posture reveals mild-moderate central canal stenosis at L1/2 with intrusion of the intervertebral disc (IVD) into the myelographic column (Figure 1). The flexion stress view reveals decreased intrusion into the canal of the L1/2 IVD with decreased deformation of the thecal sac (Figure 2). The extension view reveals massive L1/2 IVD intrusion, compression and deformation of the thecal sac producing severe central canal stenosis (Figure 3).

In this case, the patient's clinical findings correlated well to the changes noted in the functional myelographic study. The patient reported bilateral lower extremity pain that was relieved while sitting. The patient reported increased pain and lower extremity weakness consistent with a diagnosis of neurogenic claudication while walking, standing upright and in postures of lumbar extension.

Clinically, the diagnosis and management of PLIF and central canal stenosis patients require an appreciation of functional and dynamic changes that manifest by postural changes. Keen evaluation and awareness of precipitating activities of daily living can provide improved diagnostic impressions and therapeutic interventions.

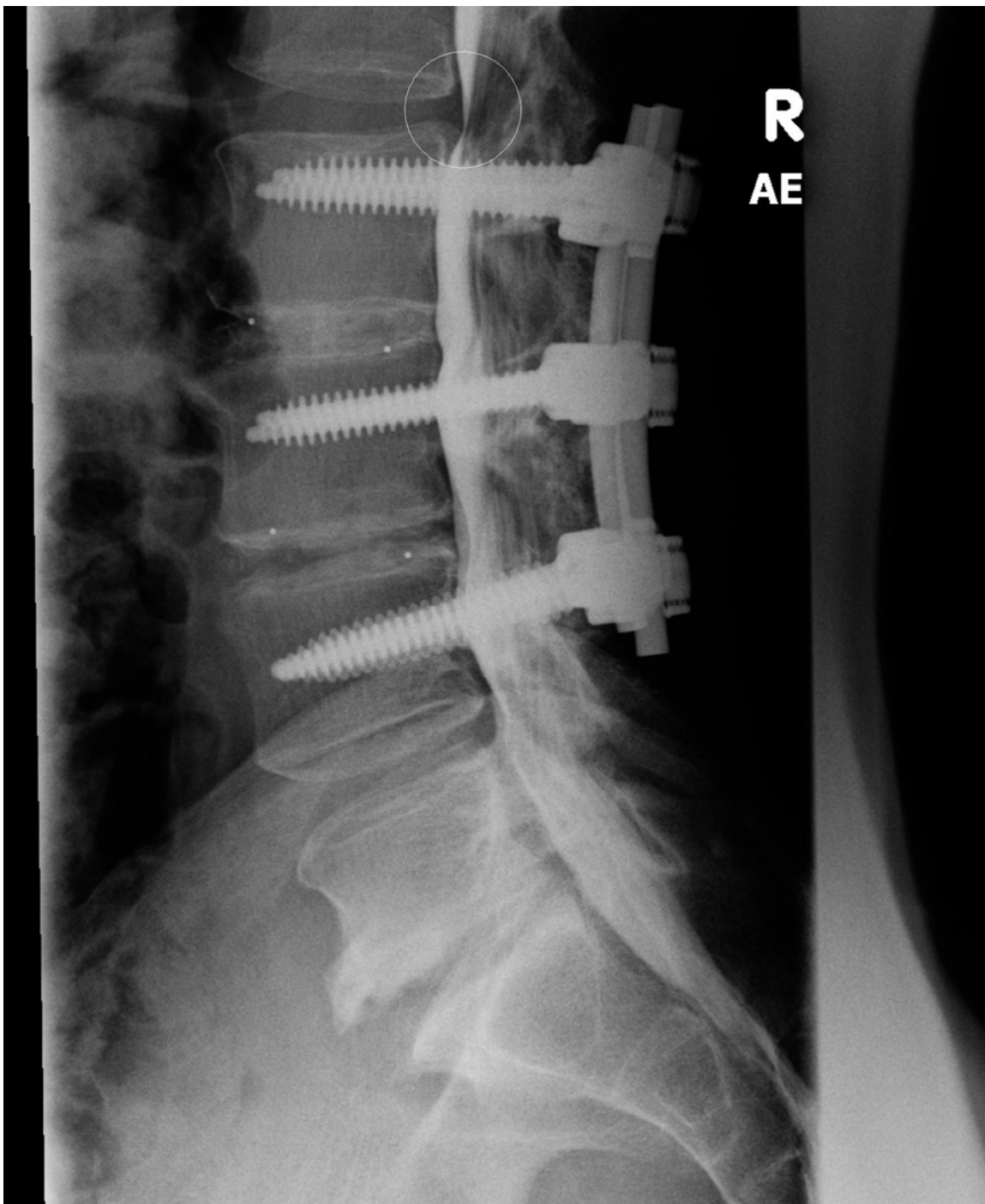


Figure 1. Weight-bearing lumbar myelogram in neutral posture. Note the moderate intrusion of the L1/2 IVD into the myelographic column.

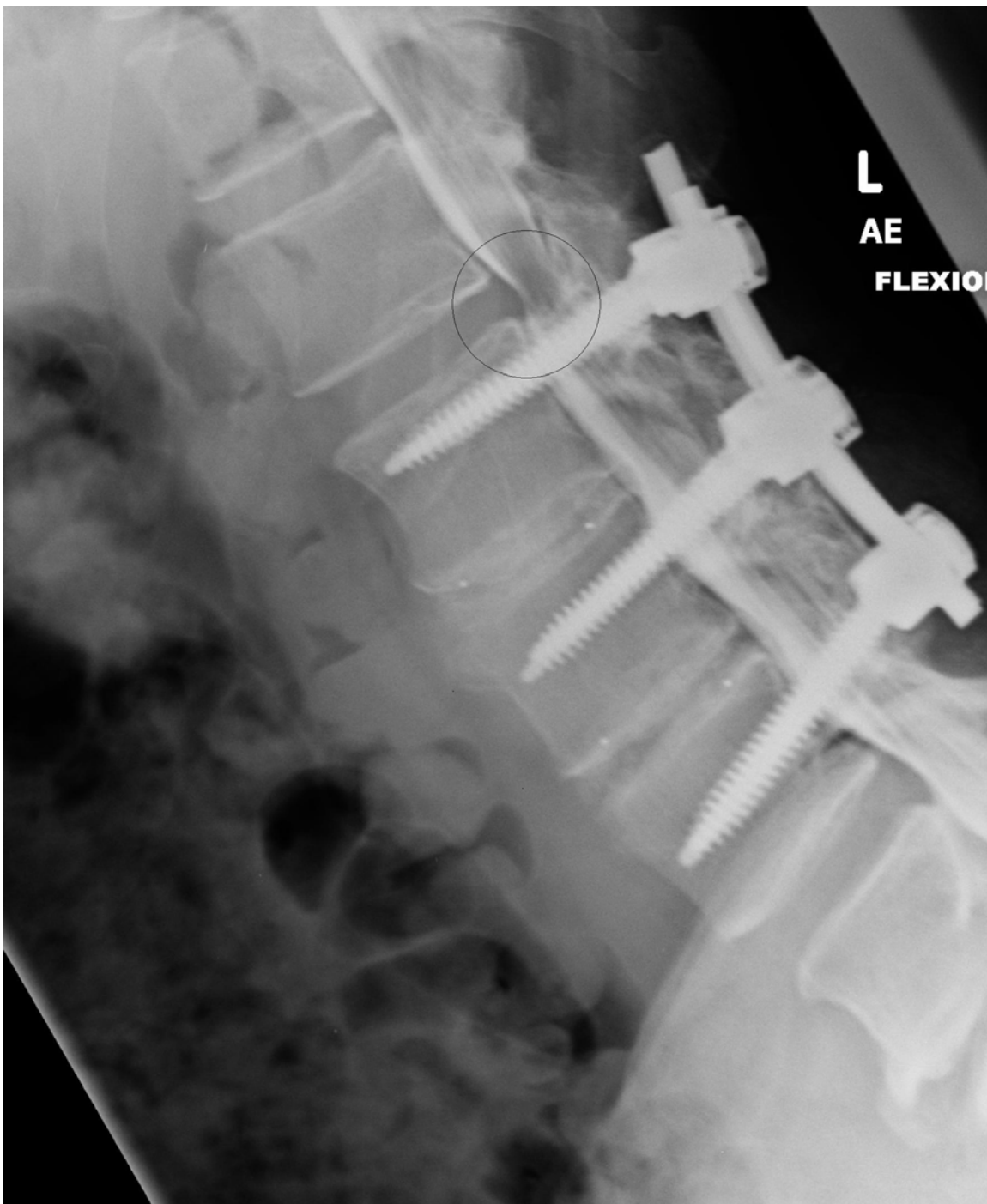


Figure 2. Weight-bearing lumbar myelogram in flexion stress posture. Note the decreased intrusion of the L1/2 IVD into the myelographic column in comparison to the neutral and extension stress images.

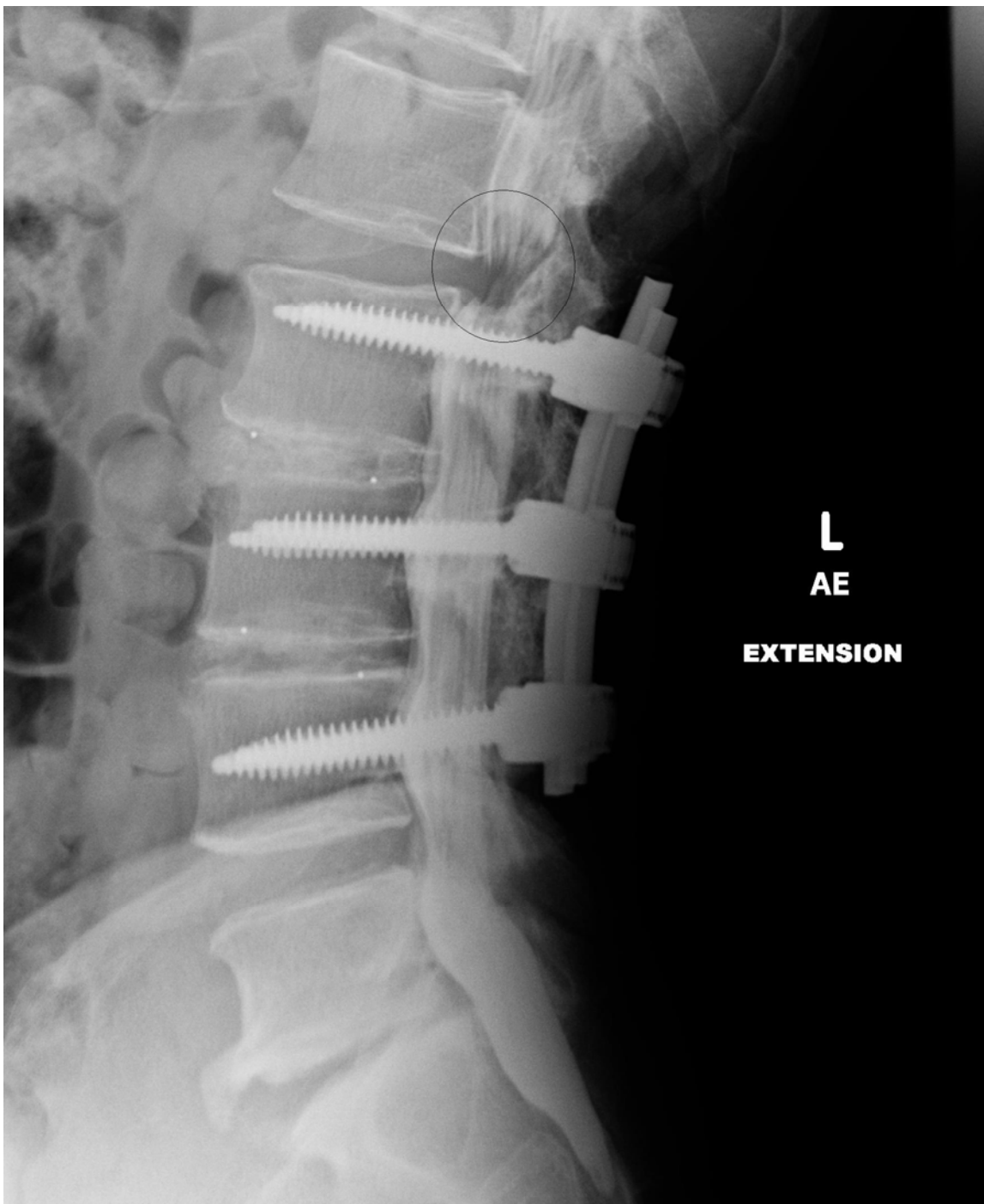


Figure 3. Weight-bearing lumbar myelogram in extension stress posture. Note the severe intrusion of the L1/2 IVD into the myelographic column producing significant compression and deformation of the thecal sac.

[Editorial Comments](#)

[Current Events](#)

Northwestern Health Sciences is in the process of obtaining certification of the new Masters program, Master of Science: Physical Medicine and Rehabilitation (MSc: PM&R). The letter of intent was received by the Academy in April 2008.

The Coalition of Orthopedists welcomed the Texas Council of Chiropractic Orthopedics to the Coalition group April 2008.

A new project for the Coalition called the Carlsbad Initiative has been developed. More information will be forthcoming as the process develops. This is being developed to provide

Academy Chiropractic Orthopedic Diplomate examination at Texas College of Chiropractic (TCC) May 2008 resulted in 5 new Diplomates of the Academy.

Attribution

Ed Payne, FCER,