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Image and Art Gallery

Abstracts and Literature Review

Radiology Corner

Announcements

Red Rock

(Courtesy: www.travelandleisure.com)

Ayers Rock - Northern Territory, Australia

Uluru, the massive red-rock monolith that looms above Australia's stark northern desert, upstages the sunset on many occasions. The best vantage point is Sunset Strip, a picnic area in

Uluru-Kata Tjuta National Park in Australia. The rock seems to glow with fiery color, especially between May and October, when the cooler weather brings high clouds that reflect the light.

Abstracts & Literature Review

Scientific Basis of Minimally Invasive Spine Surgery: Prevention of Multifidus Muscle Injury during Posterior Lumbar Surgery

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Authors' Abstract:

Study Design: Literature review.

Objective: To describe the scientific basis of minimally invasive spine surgery as it relates to posterior lumbar surgery.

Summary of Background Data: Minimally invasive spine (MIS) surgery is predicated on several basic principles: (1) avoid muscle crush injury by self-retaining retractors; (2) do not disrupt tendon attachment sites of key muscles, particularly the origin of the multifidus muscle at the spinous process; (3) use known anatomic neurovascular and muscle compartment planes; and (4) minimize collateral soft tissue injury by limiting the width of the surgical corridor.

Methods: Literature review.

Results: The conventional midline posterior approach for lumbar decompression and fusion violates these key principles of MIS surgery. The tendon origin of the multifidus muscle is detached, the surgical corridor is exceedingly wide, and significant muscle crush injury occurs through the use of powerful self-retaining retractors. The combination of these events leads to well-described changes in muscle physiology and function. MIS surgery is performed using table-mounted tubular retractors that focus the surgical dissection to a narrow corridor directly over the surgical target site. The path of the surgical corridor is selected on the basis of anatomic planes, specifically avoiding injury to the musculotendinous complex and the neurovascular bundle.

Conclusion: With these relatively simple modifications to surgical technique, significant improvements in intraoperative blood loss, postoperative pain, surgical morbidity, return of function, among others, have been achieved. However, MIS techniques remain technically demanding and a significant complication rate has been observed during the initial learning curve of the procedures.

Key words: paraspinal muscles, retraction pressures, cytokines, dynamic stability, multifidus.

Background

Whether the approach is open spine surgery or minimally invasive spine surgery (MISS), the goals remain the same: decompression in cases of nerve compression, fusion in cases of instability and restoration of alignment in cases of malalignment.

The use of MISS over open spinal surgery has the additional goals: avoid muscle crush injuries by use of retractors, avoid disruption of musculotendinous muscle attachment by surgical dissection, ability to follow facial planes and avoid injury to neurovascular bundles and avoid injury to adjacent soft tissues. Additional benefit of MISS has been shown to be reduction of blood loss, reduction of post-operative pain and morbidity and earlier return to function. This article performed a literature review to find scientific support for the noted rationale for performing MISS versus open spine surgery.

Methods

This study was a literature review to find scientific evidence in support of the rationale (reduced muscle crush injury from retractors, reduced musculotendinous disruption, reduced adjacent soft tissue injury, reduced neurovascular injury) for use of MISS versus open spine surgery.

Results

Substantial evidence was found in support of the rationale for using MISS in lieu of open spine surgery using a posterior lumbar approach. After describing the anatomy and biomechanics of several lumbar paraspinal muscles, a case was made for the use of MISS versus posterior approach for open lumbar spine surgery. Cross sectional area (CSA) of multifidus muscles, a reflection of muscle atrophy, was shown to occur post open lumbar surgery but not following MISS. This has been shown to be due to crush/ischemic injury following prolonged use of surgical retractors. There is some evidence that periodically releasing surgical retractors during extended surgical procedures as well as lengthening the surgical field to reduce retractor compression will reduce crush/ischemic injury and lead to reduced atrophy. Another cause of injury with open posterior lumbar surgery involves denervation injury of the medial branch of the posterior rami, with the multifidus particularly susceptible due to its monosegmental innervation.

Kim was able to demonstrate the patients receiving MISS procedures were able to show a gain in lumbar extension strength, while those undergoing open procedures were not. Strength gains actually correlated with multifidus CSA as measured on MRI. Kim was also able to show the open surgery resulted in physiologic markers for tissue injury (creatinine kinase and cytokines) while MISS did not.

Perhaps most importantly, Fan (see Reference #40) was able to demonstrate outcomes meaningful to patients associated with MISS versus open surgery: the MISS group had lower post-operative back pain and lower Oswestry Disability Index (ODI) scores than the open surgery group, and both the pain scores and the ODI scores correlated with multifidus CSA as measured by MRI.

Conclusions

There exists scientific evidence in support of the benefits of minimally invasive spine surgery (MISS) versus open spine surgery for posterior lumbar surgery. These benefits include reduced crush injury to muscles from use of retractors, reduced blood loss, reduced post-operative pain, improved paraspinal muscle function, improved Oswestry Disability Index scores, reduced denervation of lumbar paraspinal muscles, particularly multifidus, avoidance of disrupting musculotendinous attachment of multifidus and reduced injury to adjacent soft tissues.

Clinical Relevance

There is scientific evidence, both clinical and physiologic, for the benefit of minimally invasive spine surgery (MISS) versus open spine surgery for posterior lumbar spine surgery. There is also some scientific evidence that these clinical and physiologic markers that are evident when MISS is utilized actually correlate with outcomes that are meaningful to the patient, such as reduced post-operative pain, reduced blood loss in surgery and better improvement in post-surgical Oswestry Disability Index scores.

JACO Editorial Summary:

- This article was written by a spine surgeon involved with MISS

- The author performed a literature review to find scientific evidence in support of MISS versus open surgery for posterior lumbar surgery
- The author was able to locate several references which support the benefits (both clinical and physiologic) for using MISS versus open lumbar surgery, as well as demonstrating benefits meaningful to patients (reduced post-operative pain, improved function, reduced blood loss in surgery)
- The author did not describe the methodology or sources for the literature search, nor inclusion or exclusion criteria, for the articles chosen. No mention was made of articles which may have contradicted the findings in support of MISS.
- In the abstract the author mentions substantial difficulty with learning MISS as well as high complication rates during the learning process, but never discusses either of these topics in the body of the article
- There is no mention of the value (utility/cost) of MISS versus open lumbar surgery, which may or may not support the use of MISS versus open spine surgery

Summary

Interestingly, the primary outcomes from MISS noted in the objectives portion of the article are different than those noted in the conclusions. The proposed rationale for performing MISS was to avoid muscle damage from retractors, avoid disruption of musculotendinous attachment of multifidus, the ability to follow fascial planes and avoidance of neurovascular bundles and minimize disruption of adjacent soft tissues. However, in the conclusions section the primary outcomes of MISS included minimizing blood loss, reducing post-operative pain and morbidity and return to function.

The latter benefits (reduced post-operative pain, improved scores on ODI, reduced blood loss) may all be the most meaningful to the patient. The author did provide evidence that that clinical and physiologic benefits (which were typically reflected as maintained CSA of multifidus muscles following MISS) did correlate with at least two of these markers which were important to patients: reduced post-operative pain and improved ODI scores.

An important follow up to this article would be to review the value (utility/cost) of MISS versus open surgery for posterior lumbar surgery. In addition, a more formal literature review (this article appeared to be a more informal review) on this subject may shed more light on the risks and benefits of MISS.

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Abstracts & Literature Review

Lumbar Muscle Dysfunction during Remission of Unilateral Recurrent Non-Specific Low Back Pain Evaluation with Muscle Functional MRI

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Authors' Abstract:

Study Design: Two evaluations, a resting and exercise condition, utilizing a muscle functional MRI was performed. The resting study was performed after lying down for 30 minutes. The exercise study was performed after doing trunk extension exercises. Lumbar muscle recruitment was validated by using surface electromyography.

Objective: The basis of the study is to identify dysfunction of the lumbar musculature while performing low-load trunk extension motions during the remission of recurrent LBP.

Exercise Protocol: A standardized low load trunk extension exercise was performed starting at 45° flexion that was raised to horizontal. The lifting and lowering phase was 2 seconds in duration and the participant had to hold the load for 5 seconds. A total of 10 lifts that were at 40% of their personal repetition maximum were performed.

Methods: Utilizing muscle functional MRI during prone trunk extension to examine the lumbar multifidus, erector spinae, quadratus lumborum and psoas muscles on 13 participants with unilateral recurrent LBP one month after cessation of pain and a control group of 13 participants.

Results: The LBP group had a significantly lower rest and a significantly higher recruitment shift than the control group.

Conclusion: There is a concurrent alteration in the multifidus structure and activity of individuals with unilateral recurrent LBP despite being functionally recovered and pain free.

Background

Since 60% -80% of people with a history of acute low back pain will experience a reoccurrence of pain, an investigation into pathogenic mechanisms is necessary. Since proper function of the spinal musculature is necessary for stability during rest and motion, it was determined to be investigated. This study was designed to see if any changes in lumbar multifidus, erector spinae, quadratus lumborum and psoas muscles were noted that count as a negative consequence of spinal health and increase the risk of a reoccurrence of LBP.

Methods

Using thirteen participants with unilateral recurrent LBP and thirteen participants in the control group, muscle functional MRI's were obtained. Based on T2 imaging, the muscle characteristics during rest and during muscle recruitment were compared bilaterally.

Results

The multifidus muscle showed the most change during rest and with activity followed by the erector spinae. The quadratus lumborum and the psoas muscles were recruited the least, as expected, since extension is not a primary action of these muscles. There were no significant reported differences between the painful and non-painful sides for any of the muscles investigated. Fear of performing the exercise did not show any significant differences in performance.

Conclusions

Patients with a history of recurrent unilateral LBP demonstrate an alteration bilaterally of the muscle fibers. This tissue conversion appears to be moving toward the glycolytic muscle spectrum. This could have a negative impact on the health of the spine which might contribute to recurrent LBP.

Clinical Relevance

Just because a patient presents functionally intact and pain free, do not assume that the prior incidents of LBP did not alter the lumbar musculature in a negative manner.

JACO Editorial Summary:

- The article was written by authors from the Rehabilitation Sciences and Physiotherapy; Experimental Clinical and Health Psychology; Physical and Rehabilitation Medicine and Radiology and Nuclear Medicine Ghent University, Ghent, Belgium where the research was conducted.
- The purpose of the study was to identify the presence of lumbar muscle dysfunction during the remission of recurrent LBP, while performing a low load trunk extension.
- Thirteen participants with unilateral recurrent LBP and 13 healthy participants were utilized in the study.
- Results revealed a significantly lower T2 rest and significantly higher T2 shift in the multifidus muscles of the LBP group. No significant differences were noted between the pain sides.
- Findings suggest that the multifidus structure and activity have been altered in people with recurrent unilateral LBP, even in the absence of pain.

Summary

The results of this study should raise awareness in chiropractic physicians and/or healthcare specialists to better focus on the possible changes to the lumbar musculature and improved rehabilitation methods allowing for the opportunity of maximizing outcomes.

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Vertebral Fractures

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This Journal feature begins with a case vignette highlighting a common clinical problem. Evidence supporting various strategies is then presented, followed by a review of formal guidelines, when they exist. The article ends with the authors' clinical recommendations.

A 72-year-old woman presents with a 2-month history of increasing pain in her lower back, which has not improved with ibuprofen and is causing difficulty with walking and dressing. On questioning, she reports having lost about 5 cm (2 in.) of height since she was a young woman.

On examination, there is mild kyphosis in her lower thoracic spine but no point tenderness. A lateral spine radiograph reveals that the L2 vertebra is biconcave in appearance, a finding that is consistent with a vertebral fracture (Figure 1).

Figure 1 - Lateral Radiograph of the Spine
The radiograph shows a biconcave fracture, grade 2, in the L2 vertebra.

The Clinical Problem

Vertebral fractures - deformities of the vertebral bodies identified with imaging of the lateral spine and characterized according to shape - are the most common manifestation of osteoporosis. Vertebral fractures of the thoracic and lumbar spine account for an estimated 700,000 of the 1.5 million osteoporotic fractures occurring annually in the United States.1 These fractures are usually identified clinically when a patient presents with back pain, and a spinal radiograph is interpreted as showing a fracture of a vertebral body, most commonly in the thoracolumbar transition zone or mid-thoracic region.[2] However, in contrast with other fracture types, most vertebral fractures do not come to medical attention at the time of their occurrence. Only one fourth to one third of incident radiographically identified vertebral fractures are clinically diagnosed.[2,3]

Prevalent radiographic vertebral fractures are modestly associated with back pain and health-related quality of life[4,5] The likelihood of back pain, reduced health-related quality of life, and a clinical diagnosis increase with the severity and number of fractures.[3-5] New radiographic vertebral fractures (e.g., not present on prior radiographs) are associated with increased risks of back pain and back-related disability; the strength of these associations is greater among persons with clinically recognized vertebral fractures.[6,7] Fracture-related disability may also be greater among patients with lumbar fractures than among those with thoracic fractures.[5,6]

Vertebral fractures in older adults are associated with an increased risk of death,[8] but this increased risk is due in large part to underlying conditions (e.g., frailty) associated with both vertebral fracture and death. Both prevalent radiographic vertebral fractures and clinical vertebral fractures are also associated with a higher risk of subsequent hip and other fractures[9]; this increase in risk is only partially explained by the lower bone mineral density among patients with vertebral fractures.

Thus, the presence of a vertebral fracture has a substantial effect on the risk of subsequent fracture and should influence decisions regarding therapies intended to reduce that risk.

Study Design: The case study is based on the clinical presentation of spontaneous increasing lower back pain of two-month duration along with the protocols utilized to examine and evaluate the problem establishing a diagnosis and available treatment options.

Objective: To review all of the known causal and treatment protocols for post-menopausal vertebral fractures in the female as well as the male counterparts. To open further discussion leading to research of that which is known and unknown

Background

Vertebral fractures of the thoracic and lumbar spine account for an estimated 700,000 of the 1.5 million osteoporotic fractures occurring annually in the United States. Only one fourth to one third of incident radiographically identified vertebral fractures are clinically diagnosed.

Vertebral fractures in older adults are associated with an increased risk of death, but this increased risk is due in large part to underlying conditions such as frailty. The reported prevalence rates are lower among black women, Asian women, and men. The rates for white women are rising from 5% to 10% between the ages of 50 to 59 years and 30% or more at 80 years or older. In addition to older age clinical risk factors for incident vertebral fractures include prior fracture, history of one or more falls, inactivity, current smoking, use of systemic glucocorticoids, certain chronic medical conditions (e.g., chronic obstructive pulmonary disease, seropositive rheumatoid arthritis, and Crohn's disease), and a low body mass index.

Methods

The measurement of bone mineral density has long been a standard for monitoring for those who are at greater risk with incident radiographic fractures (odds ratio or hazard ratio for each 1-SD decrease in bone mineral density at the spine or hip, 1.5 to 2.0). Although the prevalence of radiographic vertebral fractures is highest among persons with osteoporosis (defined by a T score at the spine or hip of -2.5 or lower [>_2.5 SD below the mean bone mineral density for healthy young adults]), more than one third of postmenopausal women with

prevalent radiographic vertebral fractures have T scores at the spine and hip that are higher than -2.5.

Although medical history and an examination may suggest a vertebral fracture, the diagnosis must be confirmed with a lateral spinal imaging study. Genant has developed a semiquantitative method that is widely accepted and is practical in the clinical setting.[23] The method uses the qualitative features of vertebral height in the anterior, middle, or posterior vertical dimension to grade a vertebral body as normal, uncertain regarding fracture, or characterized by a mild, moderate ,or severe fracture. The use of this method requires the knowledge of developmental and acquired deformities.

Standard spinal radiographs and vertebral fracture assessment are not usually indicated in patients with T scores for bone mineral density that are very low (-2.5 or lower) or high (higher than -1.5), since documentation of vertebral fractures is unlikely to influence management of patient care. Other methods of spinal imaging (e.g., computed tomography and magnetic resonance imaging) and radionuclide bone scanning are typically reserved for patients in whom additional information is needed to evaluate the acuity of fractures or to differentiate osteoporotic fractures from pathologic fractures.

Results

Clinical vertebral fractures may cause pain severe enough to require hospitalization. The use of nonsteroidal anti-inflammatory drugs, analgesics (including narcotics and tramadol) transdermal lidocaine, and agents used to relieve neuropathic pain (e.g., tricyclic antidepressants) are commonly used. Although the pain of acute vertebral fracture typically subsides over the course of several weeks, narcotics are often required temporarily to facilitate mobility and avoid prolonged bed rest. Back braces both rigid and non-rigid may be used during waking hours for a period of 6 weeks and may benefit patient reported pain and disability.

Vertebral augmentation procedures (vertebroplasty or kyphoplasty) are being performed with increasing frequency in the United States; in 2005, 86 of every 100,000 fee-for-service Medicare beneficiaries underwent vertebroplasty. Studies have shown that there was no difference in outcomes with vertebroplasty and sham procedures. Rehabilitative exercise programs have not shown consistent findings across studies. All current guidelines for the management of osteoporosis recommend adequate intake of calcium (>1000 mg per day) and vitamin D (>600 IU per day). Pharmacologic therapy is indicated to reduce the risk of subsequent fractures in persons with radiographic or clinical vertebral density T score. The agents studied included oral bisphosphonates, intravenous bisphosphonates and selective estrogen receptor modulators, parathyroid hormone, and calcitonin.

Generic alendronate is frequently used as a first line treatment because of its efficacy in reducing non vertebral (including hip) and vertebral fractures, its safety profile during 10 years of use, and its relative cost.

Conclusions

The history and clinical examination of a patient suspected of having vertebral fracture must be confirmed by lateral spinal imaging. The identification of such a fracture indicates a diagnosis of osteoporosis regardless of the bone mineral density T score. Relieving pain and preserving mobility should be immediate goals that may require short-term narcotic therapy. A targeted physical therapy program initially should include postural retraining and exercise of the back extensor muscles in a hydrotherapy pool creating less resistance but at the same time increasing diffusion of fluids and vertebral joint mobility.

In addition applications of electric stimulation combined with ultrasound might help reduce regional muscle spasm. The long term goal should be to reduce the risk of future vertebral fractures. Intake of calcium hydroxyappetite of 1200 mg per day and up to 800 mg of vitamin D per day is recommended. In addition to the above it is recommended that initiation of treatment with generic alendronate be administered at 70 mg per week considering its efficacy in reducing incident

fractures, including hip fracture, and its safety and relatively low cost.

Clinical Relevance

The authors have demonstrated a thorough knowledge of incident spinal vertebral fracture leading up to the proper diagnosis and establishing a treatment protocol that could have some variation due to the medical history of the patient.

JACO Editorial Summary

- Vertebral fractures – deformities of the vertebral bodies identified with imaging of the lateral spine and characterized according to shape are the most common manifestation of osteoporosis.
- Vertebral fractures of the thoracic and lumbar spine account for an estimated 700,000 of the 1.5 million osteoporotic fractures occurring in the United States annually.
- Genant method of qualitative features of vertebral height in the anterior, middle, or posterior vertical dimension to grade a vertebral body as normal, uncertain regarding fracture, or characterized by a mild, moderate or severe fracture.
- Clinical vertebral fractures may cause pain severe enough to require hospitalization.

Summary

The study clearly shows that, to date, the best ways of vertebral fracture assessment, leading to and confirming a diagnosis, is with the patient history and clinical examination with proper lateral spinal imaging using the widely accepted, Genant semiquantitative method of vertebral analysis. This is an important step for all providers including chiropractic orthopedists, who encounter and at times will co-manage the patient's treatment program. It appears the authors of this article have done a thorough job of researching some of the latest articles available.

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Abstracts & Literature Review

Cox Decompression Chiropractic Manipulation of a Patient with Postsurgical Lumbar Fusion: A Case Report

Ralph A. Kruse, DC DABCO, Jerrilyn A. Cambron, DC, PhD

Journal of Chiropractic Medicine (2011) 10 255-260

JACO Editorial Reviewer: James A. Wyllie, DC DABCO CCWP

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Dec 2013, Volume 10, Issue 4

Authors' Abstract:

Study Design: Case Report

Objective: The purpose of this case report is to describe a patient with a L5/S1 posterior surgical fusion who presented to a chiropractic clinic with subsequent low back and leg pain and was treated by Cox decompression manipulation.

Summary of Background Data: The patient is a 55 year old male that had a recent episode of back and right leg pain after playing golf. He had a past history of grade 2 spondylolytic spondylolisthesis which was surgically stabilized approximately 2 years prior to visiting the chiropractic clinic.

Methods: Cox decompression manipulation, Electrical muscle stimulation and Ultrasound. The patient was treated 13 times over a 6 week period.

Results: The patient was 95% improved at the end of his six-week course of care. His Oswestry Disability Index went from 18% down to 2%. A two year follow-up found the patient free of pain or relapse and very satisfied with his care.

Conclusion: Conservative chiropractic care (flexion distraction), along with physiotherapy modalities may be a reasonable and viable option for the treatment of post-surgical pain patients

Background

The controversy surrounding surgical fusion as a treatment method for LBP is discussed. Complication rates are high. Some 3.75% of patients in attendance of chiropractic are post-surgical cases. This case report looks at one such patient.

Methods

This is a case report that documents the examination, including flexion extension and neutral lateral lumbar films, treatment and 2 year follow-up of a 55 year old male patient with a past history of surgical fusion to stabilize a grade 2 spondylolytic spondylolisthesis.

Results

This case report documents a successful outcome of conservative chiropractic management for an acute injury of a patient with a past history of spinal fusion.

Conclusions

Cox decompression manipulation may be an option for the treatment of patients with back and leg pain and a past history of spinal fusion.

Clinical Relevance

A low force, low velocity treatment, such as Cox decompression manipulation directed at spinal regions demonstrating Adjacent Segment Disease (ASD), may be effective in resolving back and leg pain in a patient with spinal fusion.

JACO Editorial Summary:

- The authors of this case report are chiropractors and there are no conflicts of interest.
- The purpose of this case report was to document the effectiveness of Cox distraction manipulation in the treatment of a patient with a surgical spinal fusion.
- The article begins with a discourse questioning the over utilization of back surgery in the US. Although I found the statistics interesting, I did not find them to be relevant to the case report.
- I applaud the author on his research of ASD, and found his discussion important for the chiropractic orthopedist and general chiropractor who encounters these patients in practice.
- As a side note, metal instrumentation associated with spinal fusion is not a contraindication for EMS or US.

Summary

The results of this case report should raise the awareness that chiropractic care is a promising approach to the treatment of patients that have pre-existing spinal fusions. In fact, these patients are more than likely to develop adjacent segmental dysfunction for which additional surgical intervention may be contraindicated. Additional studies should be considered, to assess the effectiveness of chiropractic management in these chronic pain patients.

Radiology Corner

Diffuse Idiopathic Skeletal Hyperostosis

Alicia M. Yochum, RN, DC
Diagnostic Imaging Resident, Department of Radiology
Logan University - Chesterfield, MO

HISTORY: A 55-year-old obese male with right sided low back pain.

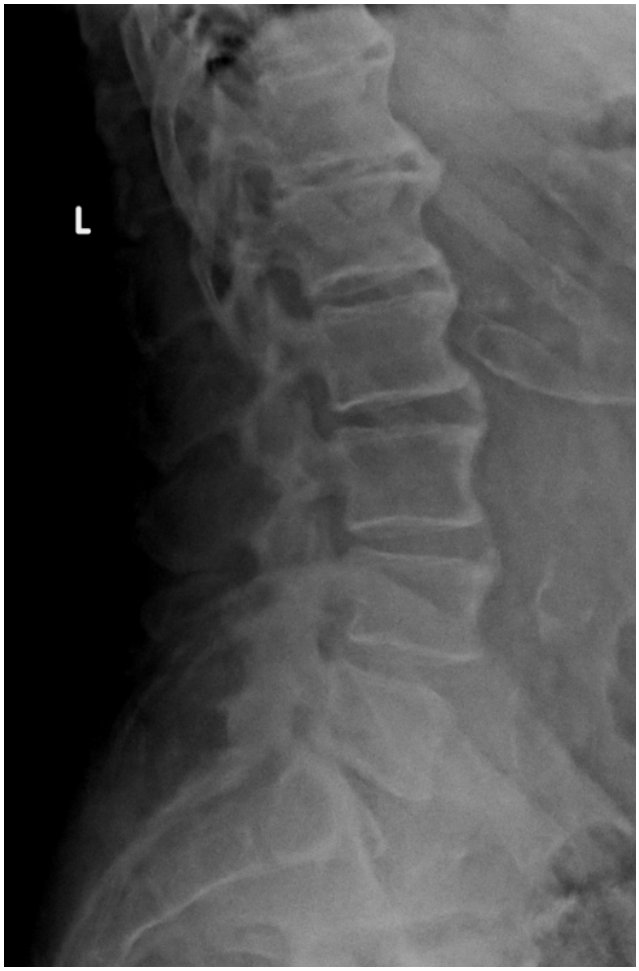

Figure 1: Observe the flowing ossification of the anterior longitudinal ligament extending from T11 to L4. Degenerative hypertrophy of the apophyseal joints is present at L4/5 and L5/S1. Atherosclerotic plaquing within the abdominal aorta without aneurysmal dilatation is present.

Comment: This patient has two forms of arthritis within the lumbar spine. Classic degenerative joint disease (osteoarthritis) is present within the lower lumbar spine apophyseal joints as well as signs of diffuse idiopathic skeletal hyperostosis of the upper lumbar spine.

Historical Pearls

In the late nineteenth century, Bechterew described an entity with progressive ankylosis and kyphosis that began in the cervical spine and descended the spine. This was originally believed to be ankylosing spondylitis but now is thought to represent diffuse idiopathic skeletal hyperostosis (DISH) therefore the term Bechterew's disease should not be associated with ankylosing spondylitis. Synonyms for DISH include Forestier's disease, spondylosis hyperostotica, spondylitis ossificans ligamentosa and senile ankylosing hyperostosis. [1]

General Characteristics

Diffuse idiopathic skeletal hyperostosis is a form of spinal and extraspinal arthritis that is characterized by calcification and ossification of various soft tissues with predilection for the anterior longitudinal ligament (ALL). It is in the category of degenerative arthritides but is a separate distinct entity and should be differentiated from osteoarthritis. Incidence within the United States has been estimated at 12.8% in women over 50 years and 27.3% in Caucasian men over 50 years. [1, 2]

Clinical Features

There is a male predilection with incidence usually occurring in patients after their fifth decade of life. Patients usually complain of symptoms similar to degenerative joint disease such as morning stiffness and low grade musculoskeletal pain in areas affected. Dysphagia may be present in approximately 20% when cervical or thoracic involvement places compression on the adjacent esophagus. Vertebral joint motion may be relatively intact despite apparent ankylosis.

Laboratory investigation may show evidence of diabetes mellitus in approximately 13-32% and HLA-B8 antigen in 40% of affected individuals. If ossification of the posterior longitudinal ligament (OPLL) is present in the cervical or thoracic spine, the patient may have signs of myelopathy especially if >60% of the central canal is occupied by the ossified ligament. [1]

Pathologic Features

Patients with DISH have an exaggerated response to form bone but the etiology has not yet been identified. It has been suggested that over secretion of pituitary growth hormone assists in the over production of hyperostotic bone but serum evaluation has been unrewarding. This theory would also support the association with diabetes mellitus as growth hormone has diabetagenic systemic action. Examination of the hyperostosis reveals initial calcification and then ossification. [1, 3]

Radiologic Features

The most common location to see radiographic findings associated with DISH is the spine. Diagnostic criteria for diagnosis includes: 1) flowing ossification of the anterior longitudinal ligament at four contiguous segments,2) relative preservation of the disc heights, 3) relative preservation of the apophyseal joint articulations with no evidence of ankylosis and 4) relative preservation of the sacroiliac articulations with no erosions, sclerosis or fusion. The most common location in the spine is the lower thoracic spine (T7-11), cervical spine (C4-7) and then the lumbar spine (L1-3).

Hyperostosis extends from the middle of the superior vertebral body and extends to the middle of the adjacent inferior vertebral body. In the lumbar spine this ossification can take on the appearance of a candle flame as it extends upward and tapers. Other descriptive terms used to describe the appearance in the spine include dripping candle wax, flame-shaped osteophyte, flowing hyperostosis and undulating (bumpy) contour. There may be a radiolucent line traversing the ossification which should not be confused as a fracture as it is just herniated disc material within the ossified ligament. Ossification of the posterior longitudinal ligament can occur in association with DISH in up to 50% of patients and most commonly in the cervical spine. Ossification of ligament or tendon insertion sites (entheses) can occur in extraspinal locations with common locations including the pelvis, patella, calcaneus, foot and elbow. Extraspinal involvement at peripheral entheses occurs in up to 30% of patients who have DISH in the spine. The characteristic appearance is that of roughening of the tendon or ligament attachment to bone with normal adjacent joint space. The ligaments at the superior aspect of the sacroiliac joint may ossify but there will be no narrowing of the joint space or associated erosions. [1-3]

Differential Diagnosis

Differentiation from other forms of arthritis such as degenerative joint disease (DJD), ankylosing spondylitis, psoriatic and reactive arthritis is necessary. The preservation of joint and disc spacing is a good differentiator for DJD. Ankylosing spondylitis typically induces sacroilitis

in the lower two-thirds or synovial portion of sacroiliac joint. DISH may ankylose the upper one-third or the superior fibrous or ligamentous portion of the joint. Also, the ligament ossification in ankylosing spondylitis is much finer and pencil thin in comparison to the bulky ossification that occurs in DISH. Psoriatic and reactive arthritis cause non marginal syndesmophytes in the spine but do not have a predilection for the ALL and can occur laterally. [1-3]

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Announcements

ICD10-CM - Preparation Is Key

Tony Hamm, DC, FACO, DABFP

After multiple delays, protests from many professional organizations, payers and providers ICD-10-CM is scheduled to rollout on October 1, 2014. Despite all the pushback there are actually many benefits of replacing ICD-9.

ICD 10 - CM will be helpful in conducting research, clinical trials and epidemiological studies; designing payment systems and developing health policy. ICD 10-CM will make it easier to measure quality, safety and efficacy of care and reduce the need for record requests. It may also improve clinical, financial and administrative performance.

Will ICD 10-CM have an impact in our practices? The simple answer is yes.

Vendor and payer contracts will require updating. Policies and procedures tied to a diagnostic code, disease management, tracking or PQRS may need to be changed. Documentation will, of course, need to support the diagnostic code reported. It will be imperative that we document laterality, stages of healing, episodes of care and more. It should also be noted that not every payer is considered a covered entity under HIPAA. These may include workers compensation and/or liability carriers, necessitating maintenance of the ICD 9 system.

While there are multiple benefits to moving from ICD-9 to ICD 10, please do not underestimate the need to prepare for the transition. The change to ICD 10-CM will require individual strategic planning by the physician and all staff personnel. Failure to do so will result in delay in payment of claims. Make sure you communicate with your electronic billing clearinghouse to run test claims prior to implementation.

There are currently several resources available including the American Chiropractic Association, CMS and ChiroCode Institute.

ACA website: www.acatoday.org/ICD10

CMS website: www.cms.gov/Medicare/Coding/ICD10/Downloads/ICD-10MythsandFacts.pdf

ICD-10 Coding for Chiropractic, ChiroCode Institute

ACA will soon make available to members an easy to follow guide *entitled ICD 10-CM Toolkit-Practical Resources for the Chiropractic Office.* This is one of many benefits of ACA membership. Should you need an application to become a member, contact me by email: thammdc@suddenlink.net.

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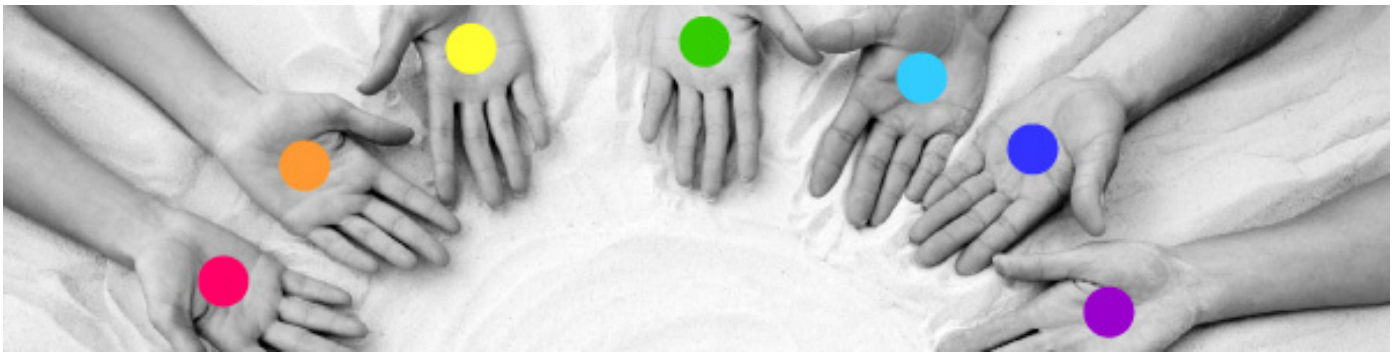

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