

## **Literature summary for SOM jan-march 2008**

### **Debbie Cox**

#### **Intracranial hypotension and abducens palsy following upper spinal manipulation**

**K Kurbanyan, S Lessell**

**British Journal of Ophthalmology 2008;92:153-155**

This is a case report of a patient who developed orthostatic headache (worse when standing eased by laying down) secondary to intracranial hypotension several days after chiropractic manipulation of the cervical spine.

The patient was a healthy 46-year-old woman with neck stiffness. The manipulative technique used involved rotation of the head with axial tension. She experienced neck pain during the manipulation. Several days later she developed occipital headaches relieved by reclining, worsening neck pain and stiffness, unsteadiness of gait, malaise and visual disturbance. There was gradual and spontaneous full recovery of her symptoms over a number of weeks

Cervical magnetic resonance imaging (MRI) showed contrast enhancement of the basilar meninges which is consistent with injury and these changes were not demonstrated on MRI repeated once symptoms had resolved. She also had raised CSF protein levels. The authors state these findings to be compatible with a diagnosis of intracranial hypotension possibly from a meningeal tear, particularly given there were no signs of brainstem infarction and her neck vessels were normal on imaging. They conclude this patient's abducens paresis resulted from the intracranial hypotension and that evidence is accumulating for cervical chiropractic manipulation being a precipitating factor.

#### **Care and management of osteoarthritis in adults: summary of NICE guidance. Conaghan PG, Dickson J, Grant RL. Guideline development group BMJ 2008 Mar 1;336(7642):502-3 PMID: 18310005**

This article in the BMJ draws attention to the NICE guidelines for osteoarthritis care and gives a useful summary .

Core treatments: should be considered first for every person with osteoarthritis.

- Education, advice, access to information
- Strengthening exercise, aerobic fitness training
- Weight loss if overweight

If further treatment required

- Paracetamol
- Topical NSAIDS

Adjunctive treatments: have less well proved efficacy, provide less symptom relief, or have increased risk to the patient compared with paracetamol and topical NSAIDS

- Shock absorbing shoes or insoles
- Transcutaneous electrical nerve stimulation
- Manual therapy
- Joint arthroplasty
- Assistive devices
- Local heat and cold applications
- Intra-articular corticosteroid injections
- Opioids
- Oral NSAIDS including Cox-2 inhibitors
- Capsaicin
- Supports and braces

### Evidence levels

#### Paracetamol and/or topical NSAIDS

for pain relief regular dosing may be needed. High quality evidence from meta-analyses and RCT's .

#### Opioid analgesics

If paracetamol or topical NSAIDS are insufficient for pain relief. High quality evidence from meta-analyses.

#### Oral NSAID or COX 2 inhibitor.

Substitute for or in addition to paracetamol. Recommended to be given at the lowest effective dose for the shortest possible period of time. High quality evidence from large randomised controlled trials, supplemented by meta-analysis and health economic modelling of cost effectiveness

#### Topical capsaicin.

moderate quality evidence from small RCTs

#### Intra-articular corticosteroid injections

Relief of moderate to severe pain. Moderate quality evidence from meta-analysis and small RCTs

#### Referral for surgical interventions

Referral for arthroscopic lavage and debridement only with a clear history of mechanical locking, "giving way," or x ray evidence of loose bodies. Moderate quality evidence from small to moderately sized RCT

Referral for joint replacement surgery for people with symptoms that substantially affect their quality of life and are refractory to non-surgical treatment before there is prolonged and established functional limitation and severe pain. Moderate quality evidence from expert opinion papers, one cross sectional study, one observational study, and one observational-correlation study.

Patient specific factors such as age, sex, smoking, obesity, and comorbidities should not be barriers to referral for joint replacement surgery. Moderate quality evidence from large cohort studies. Base decisions about referral thresholds on discussions between patient representatives, referring clinicians, and surgeons, rather than on current scoring tools for prioritisation. Based on absence of evidence supporting prioritisation tools

#### Electroacupuncture/acupuncture

Electroacupuncture is not recommended based on one moderate quality RCT plus cost effectiveness analysis.

Insufficient evidence exists despite RCTs and cost effectiveness analysis to make a firm recommendation on acupuncture.

#### Glucosamine

Glucosamine and chondroitin products are not recommended. High quality evidence from meta-analyses and RCTs, plus cost effectiveness analysis

#### Rubefacients

Not recommended. Moderate quality evidence from small RCTs

#### Intra-articular hyaluronan injections

Not recommended. High quality evidence from meta-analysis and RCTs, supplemented by cost effectiveness analysis

**Diagnostic imaging guideline for musculoskeletal complaints in adults-an evidence-based approach-part 2: upper extremity disorders. Bussieres AE, Peterson C, Taylor JA. Journal of manipulative physiology and therapeutics. 2008 Jan;31(1):2-32 PMID 18308152**

This article is part of a series the aim of which is to develop evidence-based diagnostic imaging practice guidelines to assist chiropractors and other primary care providers in decision making for the appropriate use of diagnostic imaging for upper extremity disorders.

Radiographs

Most patients with chronic shoulder pain can be adequately evaluated with a history and physical examination. In adult patients with full or limited movement and non-traumatic shoulder pain of less than 4-weeks duration radiographs are not initially indicated. Indications for radiographs include:

- No response to care or significant activity restriction after 4 weeks.
- Osteoarthritis unrelieved by 4 weeks conservative care
- Glenohumeral instability
- Significant trauma
- Inflammatory/crystal induced arthropathy
- Osteonecrosis
- Complex regional pain syndrome
- Triangular fibrocartilage complex lesion (ulnar side wrist pain with associated clicking and popping traumatic or degenerative)
- acute disabling pain and significant weakness
- function not improving or deteriorating
- Unexplained significant sensory or motor deficit
- Red flags (Nonmechanical, unrelenting pain, pain at rest, constant or progressive symptoms and signs, pain not changed on assessment, suspicion of cancer, unexplained deformity, palpable enlarging mass, or swelling, significant unexplained pain, red skin, fever, systemically unwell)

## Specialist imaging

Magnetic resonance imaging (MRI), ultrasonography (US), computerised tomography (CT) nuclear medicine (NM)

Specialist referral recommended even if conventional radiographs are unremarkable if there is:

- Pain and significant disability lasting over 6 months, despite attention to occupation and sporting factors
- In the absence of clinical improvement after 4 weeks of therapy
- If function does not improve or deteriorates
- History of instability, or acute, severe post-traumatic acromioclavicular pain
- In presence of a potentially serious pathology as suggested by the patient history, examination, and/or radiograph
- Rotator cuff when calcification is suspected
- For impingement MRI is the gold standard but it is a dynamic process that can also be assessed with ultrasound
- MRI and ultrasound can be of value in diagnosing partial thickness rotator cuff tears as clinical examination is less reliable in the diagnosis of partial than full thickness tears
- Adhesive capsulitis MRI with arthrogram
- Prompt MRI indicated in suspected septic arthritis
- Glenohumeral instability (MRI)
- Significant trauma with normal radiographs and symptoms persisting (CT/MRI)
- MRI is the procedure of choice to exclude osteonecrosis, marrow, and joint disease including infection
- MRI helps differentiate erosive from non erosive disease in RA

**Diagnostic imaging practice guidelines for musculoskeletal complaints in adults-an evidence-based approach-part 3: spinal disorders. Bussieres AE, Taylor JA, Peterson C. Journal of manipulative physiology and therapeutics 2008 Jan;31(1):33-88 PMID: 18308153**

This is from the same series as the previous article. It summarises the important components of history, examination and diagnostic triage:

- Appropriate questioning to exclude red flags, underlying sinister cause or serious injury (fracture /dislocation)
- non specific back, neck, extremity pain with or without restriction of ADL
- Physical examination for evidence of nerve compression/ radicular syndrome
- Is there underlying systemic disease?
- Is there neuro impairment that may require surgical intervention?
- Is social or psychological distress prolonging or amplifying pain?

An extensive list of possible red flag symptoms is given:

- Age under 20 over 50 with signs and symptoms suggesting systemic disease.
- Non mechanical pain (unrelenting at rest, constant, progressive severe symptoms, significant activity restriction)
- Progressive structural deformity of thoracic spine (scoliosis, kyphosis), thoracic pain with lower extremity neurology, abnormal laboratory findings.
- Significant trauma.
- Saggital plane neck rigidity in the absence of trauma (discitis, infection, tumour, meningitis)
- High risk ligamentous laxity, atlantoaxial instability ( RA, connective tissue disorders, downs syndrome)
- Gait disturbances
- Suspected cervical myelopathy
- Dysphasia, impaired consciousness, CNS signs (cranial nerve abnormalities, pathological reflexes, long tract signs)
- Suspected cervical artery dissection 5d's and 3 N's (dizziness, dysphasia, drop attacks, diplopia, dysarthria, nausea, numbness, nystagmus).
- Confusion, headache facial pain, hemianesthesia, hemiparesis, monoparesis, visual field disturbances
- Sharp severe neck/occipital pain sudden and unlike that previously experienced

### Conventional radiography

Not initially indicated for non specific acute, subacute or persistent back and neck pain with no red flags.

Indications:

- After significant mechanism (blunt trauma, distracting painful injury, pedestrian, cyclist, motorcyclist, midline spinal tenderness, neuro deficit, altered consciousness)
- Neck injury- over 65,
- Extremity parasthesia following trauma
- no improvement after 4-6 weeks conservative treatment or increasing disability
- radicular syndrome
- red flags
- progressive neuro deficit, disabling limb pain
- pre operative planning.
- Suspected degenerative spondylosthesis, lateral canal stenosis (back pain and/or leg pain/neuro deficit worse with activity)
- spinal stenosis ( over 65, neurogenic claudication, variable neuro deficit)
- over 50 and has progressive neuro deficit
- Suspected compression fracture (severe onset of pain usually lumbosacrel-gluteal area after minor trauma in older patients)
- Radiographs unreliable for assessment of bone density before 30-50% loss.

## Specialised imaging

MRI, CT, NM, US

- Back and neck pain with adverse features (sphincter or gait disturbance, saddle anaesthesia, severe or progressive neuro deficit, systemic illness, suspicion of cancer, infection, vascular causes e.g suspected abdominal/thoracic aortic aneurysm, cervical artery dissection)
- Red flags
- For further assessment of injury extent which cannot always be determined by plain radiographs
- Progressive neuro deficit, disabling limb pain
- Pre operative planning.
- Further assessment of compression fracture for ligamentous instability or neural injury
- DXA (dual energy xray absorptiometry) for a more accurate indication of bone density
- Suspected cauda equina (LBP bilateral or unilateral sciatica, altered saddle anaesthesia, lower extremity motor weakness, urinary retention, bladder/bowel incontinence). Emergency referral without imaging as this will be carried out by specialist team.
- Suspected abdominal aortic aneurysm (AAA), early signs and symptoms include abdominal pain, backache, groin/testicular pain feeling of fullness or abdominal pulsation, feeling of pressure on lumbar spine. There is a higher incidence of AAA in connective tissue disease (marfans, ehlers danlos syndrome).Referral for specialist investigations indicated (ultrasound screening and surgical consultation).

\*Dissecting AAA is a surgical emergency symptoms and signs include, excruciating back/abdominal pain, cardiovascular shock, syncope, hypotension, acute abdominal ripping/tearing sensation and absence of distal lower limb pulses.

**Soft tissue injuries: introduction and basic principles. Sloan J. Emergency medicine journal 2008 Jan;25(1):33-7 PMID 18156539**

This is an overview of management of soft tissue injuries in the emergency care setting aimed primarily at Emergency nurse practitioners (ENP's) and junior medical staff. It provides a revision of the basic principles of pathophysiology of soft tissue injury and some useful examples for those working in the acute care setting of possible musculoskeletal masqueraders which can be potentially serious and life threatening:

- Shoulder tip pain when the diaphragm is the site of pathology or with perforated viscus
- Interscapular pain in aortic dissection.
- Right sided periscapular pain in gall bladder disease
- Back pain with ascending psoas infection following groin injection in the intravenous drug user leading to infective discitis and osteomyelitis of the lumbar body.
- Necrotising fasciitis, where initially there is little to see, but the patient has disproportionately severe pain.

**Extracorporeal shock wave therapy for calcifying tendinitis of the shoulder. Hsu CJ, Wang DY, Tseng KF, Fong YC, Hsu HC, Jim YF. Journal of shoulder and elbow surgery 2008 Jan-Feb;17(1):55-9 PMID 18069011**

National institute of clinical effectiveness describes extracorporeal shock wave therapy (ESWT) as a non-invasive treatment using a device to pass low or high energy shock waves through the skin to the affected area. Ultrasound guidance may be used to assist with positioning of the device. The shock waves are generated and focused using electrohydraulic, electromagnetic or piezoelectric energy. Low-energy shock waves are applied in a series of treatments and are not usually painful. High-energy shock wave treatments are generally given in one session and being more painful they require some kind of anaesthesia.

ESWT is also referred to as extracorporeal shock wave lithotripsy. Lithotripsy being a medical procedure that uses shock waves to break up stones that form in the kidney, bladder, ureters, or gallbladder. It is considered by urologists to be the gold standard in treating renal calculi and has almost completely replaced invasive surgery. More recently it has been used in musculoskeletal conditions including ununited fractures, lateral epicondylitis, plantar fasciitis, and calcific tendonitis of the shoulder and has shown promise in the promotion of fracture healing and repair of tendinopathies.

This was a prospective study carried out in china of ESWT for calcific tendinitis of the shoulder. 46 patients were randomly divided into 2 groups, treatment and control. Inclusion criteria were shoulder pain attributable to calcific tendinitis that had failed to respond to at least 3 months of non operative treatment. The 33 patients in the treatment group received 2 courses of ESWT, the control group received sham treatment with a dummy electrode. Before each application of ESWT or sham treatment, 10 mL of 2% lidocaine was injected into the affected area. ESWT was administered in 2 sessions, 2 weeks apart.

The most commonly encountered adverse reactions were pain, local irritation, skin changes such as redness or bruising, swelling, and haematoma formation. After

treatment, each patient was instructed to ice the shoulder for 48 hours along with administration of paracetamol if necessary and this resolved all complaints of local discomfort. No neurovascular complications were noted.

Orthopaedic examinations were done prior to treatment and at 6 weeks, 12 weeks, 6 months, and 1 year after the final ESWT session. An anteroposterior (AP) radiograph with the arm in neutral rotation was obtained before treatment and at each of the follow-up examinations. Resorption was graded as none, partial, or complete by a radiologist who was blinded to treatment status and examination findings. Evaluation of function was done independently of the treating orthopaedic surgeon using a scoring system for pain, activities of daily living, shoulder motion, power and a visual analog scale was used to measure pain at baseline, 6 weeks, 12 weeks, 6 months, and 1 year after treatment.

There was no statistically significant difference observed between groups before treatment. Improvement after treatment was statistically significant for the ESWT group but not for the control group. There was a significant reduction in mean size of calcium deposits after therapy for the ESWT group. In this group, calcium deposits were completely eliminated in 7 cases (21.2%), partially eliminated in 11 (36.3%), and unchanged in 15 (45.4%). Fragmentation of calcium deposits was seen in 6 patients as early as 6 weeks after ESWT. In those patients who had complete elimination of calcium deposits 6 were complaint-free and none showed any recurrence of calcium deposits at 1 year after ESWT. Of the 11 patients who had partial elimination of calcium deposits, 7 were complaint-free, 3 patients had significant improvement, and the remaining patient had moderate pain.

In the control group no patients had complete elimination of calcium deposits, they were partially eliminated in 2 patients (15.3%), and unchanged in 11 (84.7%) and no fragmentation of the calcium deposits could be detected

The mechanism by which shock wave therapy acts is not fully understood. It has been shown to enhance neovascularization at the tendon-bone junction with early release of growth and proliferating factors which lead to improved blood supply and tissue regeneration.

The authors conclude that ESWT is a new, safe and effective therapeutic modality for treating calcific tendinitis of the shoulder. The effects appear to be cumulative over a time period of up to 6 months following treatment. After this function and pain scale scores did not significantly improve. They suggest that in patients who do not improve after ESWT in the 6 month time frame other forms of treatment should be considered.

**Physical work and chronic shoulder disorder. Results of a prospective population-based study. Miranda H, Punnett L, Viikari-Juntura E, Heliovaara M, Knekt P. *Annals of rheumatic disease* 2008 Feb;67(2):218-23.**

This long term study was carried out in Finland to assess whether occupational physical load predicted subsequent chronic shoulder disorders. In 1977–80 a comprehensive national survey was carried out among a representative sample (n=7217) of the Finnish adult population. Twenty years later, 1286 participants from

the previous survey were invited to be re-examined, and 909 (71%) participated. After excluding those with diagnosed shoulder disorders at baseline, 883 subjects were available for the analyses.

This approach investigating work-related exposures in a cohort of the normal population has the advantage of looking at all segments of the population. In addition to achieving information on the magnitude of a particular health problem in the population, important information on the distribution of the potential risk factors and their effects was collected across a wide variety of people. The results may therefore be better generalisable to other populations.

A detailed medical history from interview and medical records was taken of previous shoulder diagnosis, treatments, sick leave and x-rays. Specific diagnoses included rotator cuff tendinitis, biceps tendinitis, frozen shoulder, inflammatory arthritis, post-traumatic condition, or other non-specified shoulder disorder and was based on a standard clinical examination protocol and symptoms. Symptoms had to have been present for at least 3 months to be considered chronic.

All staff involved in the trial attended a 3- week training course. Quality control measures included observation, video recording with feedback on examination technique, and repeated and parallel measurements. A subsample of 94 subjects underwent the standard clinical examination performed by two field physicians to establish repeatability of diagnoses.

In order to identify physical risk factors subjects were asked which of the following tasks are/were typical in their job:

- lifting or carrying heavy loads
- working in forward flexed, twisted or other awkward postures
- shaking of the whole body eg, working in a vibrating vehicle
- use of vibrating equipment eg operating a power saw
- a constantly repeated series of movements
- work paced by a machine

Potential confounders of the association between physical exposures and the outcome were considered to be:

- work-related psychosocial factors (monotonous work, a tight work schedule, worry about making mistakes, perceived psychological well-being, somatisation)
- age
- gender;
- body mass index (BMI)
- smoking
- leisure-time physical activity
- prior shoulder injury
- diabetes

Work exposure to repetitive movements and vibration at baseline increased the risk of chronic shoulder disorder. Statistically significant risk factors differed between gender for men they were vibration and repetitive movements, and for women lifting heavy

loads and working in awkward postures. Lifting was a strong predictor of a subsequent disorder among those older than 45 years at baseline.

BMI modified the effect of two individual physical exposures, working in awkward postures and work involving repetitive movements. These exposures had a strong increasing effect on the risk of a shoulder disorder among those with BMI lower than 25 whereas for overweight subjects working in awkward postures or performing repetitive movements did not further increase the already elevated risk of developing a shoulder disorder. The authors offer a potential explanation in that overweight people may perceive physical exposures differently (eg experiencing and reporting more awkward work postures). There was a significant increase in exposure reporting among those with BMI of 25 or over which was not dependent on age, gender, education or the presence of shoulder symptoms at baseline. This suggests that not only physical exposures at work but also obesity are important targets for the prevention of shoulder disorders.

Even after the follow-up interval of 20 years occupational physical exposures predicted future shoulder disorders. Lifting heavy loads, working in awkward postures, work involving vibration or repetitive movements increased the risk by 80–150%. If the deteriorating effects of physical work on the health of the shoulder was only short-term and reversible a clear decline in the risk among the older subjects, who had left work several years before the diagnosis of the shoulder disease would have been seen. This was not the case suggesting the damaging effects of physical work are long-term and perhaps irreversible.

The authors conclude that occupational physical loading increases the risk of a subsequent clinical shoulder disorder and the effects seem to be long-term. Work-related physical exposures linked to shoulder disorders are heavy workload, working in awkward postures, repetitive movements and vibration, and particularly their combination. Early preventive measures at the workplace may therefore have long-lasting health benefits for the shoulder. The authors also acknowledge this study does have some limitations. Statistical power was weak due to only 63 incident cases. The assessment of physical exposures was based on self-reports the interpretation of heavy work being the patients subjective opinion. Also subjective questions did not include information on the potentially harmful features of physical work that were not well known 20 years ago (eg whole-body and hand–arm vibration were not assessed separately).

**The biomechanics of step descent under different treatment modalities used in patellofemoral pain. Selfe J, Richards J, Thewlis D, Kilmurray S. Gait posture 2008 Feb;27(2):258-63 PMID: 17532637**

Evidence that patellar taping is effective at relieving patellofemoral pain is emerging from the literature. The mechanical effects of taping are still under debate however there exists some evidence as to the importance of the proprioceptive effects of taping.

Patellofemoral braces are designed to reduce compression of the patella as well as to prevent excessive lateral shifting. Research on the effects of bracing in the

management of patellofemoral problems is limited. Pain relieving effects of bracing have been attributed to increased joint stability reducing muscle force generation.

This study investigated the effect of patellar bracing and taping on the three-dimensional mechanics of the knee during a controlled eccentric step down task. Gait activities involving level walking do not provide a sufficient challenge to dynamic control of the patella and researchers are increasingly investigating variables associated with eccentric control during step descent which is also more challenging than step ascent.

Kinematic data were collected using a six camera motion analysis system. Both taping and bracing claim to change the position of the patella in the coronal and transverse planes. This study focused on the moments and movements in these planes. There were twelve healthy participants, mean age of 28 years. All participants reported to be free from any pain or pathology affecting the spine or lower limbs at the time of testing.

Subjects undergoing the taping technique were placed supine with a relaxed, extended knee. One strip of tape was applied without tension across the centre of the patella. The tape was not pulled in either the medial or lateral direction. Neutral taping was chosen for consistency and the authors cite a previous study where the direction of tape was not found to be significant when measuring immediate pain reduction during a step down activity. The length of tape used was 50% of the total circumference of the subject's knee.

The patellofemoral brace and taping led to a significant reduction in the maximum coronal and of torsional knee angles by 58 and 28, respectively ( $p = 0.030, 0.006$ ). The range of coronal and transverse plane knee moments was also significantly reduced by 0.15 Nm/kg and 0.03 Nm/kg ( $p = 0.020, 0.0019$ ). The brace was shown to be more effective in the coronal and transverse planes in comparison to taping or no intervention.

An overall reduction in the range of motion about the knee could improve joint control. Both the brace and tape reduced the range of torsional moments and movements but only the brace had a statistically significant effect on all the variables. This suggests that the brace was more effective than the tape. No further comment is made of the clinical significance of these findings.

The authors suggest neuromotor and mechanical mechanisms are possible explanations for the improved control of the knee joint. Both of these could be attributed to the brace. Only neuromotor changes could be attributed to taping as a neutral technique was applied with no directional force. They suggest the greater effectiveness of the brace may be due additional cutaneous stimulation as it covers a much larger surface area of skin compared to tape and this is a significant factor in enhancing neuromotor control. Alternatively, the effect may be mechanical, the directional force component applied by the brace, absent in neutral taping may account for the greater control seen in the coronal and transverse planes in braced subjects.

The fact that mechanical changes were measured in subjects who were taped with a technique that did not introduce any medially or laterally directed force to the patella supports the idea that patella taping has at least some of its effect through cutaneous sensory stimulation. This is consistent with previous studies observing that neutral taping can enhance neuromotor performance. The authors are currently involved in replicating this work in a group of patients with patellofemoral pain.

**Hip joint pain referral patterns: a descriptive study. Leshner JM, Dreyfuss P, Hager N, Kaplan M, Furman M. Pain medicine 2008 Jan-Feb;9(1):22-5 PMID: 18254763**

Physical examination, tests for hip joint pain have not been validated against controlled intra-articular hip blocks. Fluoroscopically guided intra-articular injection (FGIA) injections have been the gold standard for diagnosing sacroiliac (SI) and lumbar zygapophyseal joint pain and can be used in analogous fashion in hip joint investigations.

The innervation of the hip joint is from the obturator, femoral, and sciatic nerves. The objective of this multicenter, retrospective, descriptive study was to characterize hip joint pain referral patterns based on preinjection pain diagrams completed by patients who had a positive response to FGIA into the hip joint.

Subjects were 51 consecutive patients meeting clinical criteria of a symptomatic hip joint which were, evidence of hip pathology on plain radiographs or magnetic resonance imaging and  $\geq 90\%$  pain reduction 30 minutes after the FGIA hip injection. This was assessed by the amount of pain whilst performing a typically painful activity.

Outcome measures were anatomic pain map before hip injection and visual analog scale both before and after hip injection. Before injection, patients completed an anatomical pain drawing and visual analog scale. At 30 minutes after injection, each patient completed a postprocedure visual analog scale.

The hip joint was shown to cause pain in traditionally accepted referral areas. 55% of patients experienced referral to groin and 57% to the thigh. 71% of patients experienced buttock pain and 22% experienced pain in the lower limb distal to the knee. The most common referral combination was buttock pain with thigh referral which occurred in 20% of subjects.

The referral patterns identified in this study are similar to previously reported patterns observed from the SI and lumbar zygapophyseal joints. For example patients with buttock pain relieved by a single intra-articular SI joint injection and patients gaining ease from thigh, buttock and groin pain following lumbar zygapophyseal joint blocks.

The authors conclude that buttock pain is the most common pain referral area from a symptomatic hip joint. Traditionally accepted groin and thigh referral areas were less common in this sample of patients and the hip joint pain can occasionally refer distally to the foot. The hip joint must therefore be considered in the differential of buttock, groin, thigh and more distal lower extremity pain.

**Interventional microadhesiolysis: a new nonsurgical release technique for adhesive capsulitis of the shoulder. Ahn K, Lee EH, Yang SM, Lim TK, Kim YS, Jhun HJ. Biomed central musculoskeletal disorders 2008 Jan 29;9:12 PMID: 18230127**

Interventional microadhesiolysis is a technique to release adhesions in joints and soft tissues. The authors describe how this technique can be used to treat adhesive capsulitis of the shoulder. They refer to it as a nonsurgical intervention as it does not include an intra-articular approach and is minimally invasive.

The aim of the procedure is to release the structures that cause significant loss of range of movement (ROM) at the shoulder. The glenohumeral joint synovial capsule is often involved in adhesive capsulitis but studies have shown that most of the significant ROM loss results from pathology in structures outside of the glenohumeral joint synovial capsule such as coracohumeral ligament, rotator interval, subscapularis muscle, and subacromial bursa.

This paper describes the procedure and evaluates the efficacy of the intervention for adhesive capsulitis of the shoulder in ten patients. 3 separate procedures are described all carried out with specially designed needles;

- Posteroinferior capsule release. The most significant capsular adhesions are observed in this area in patients with adhesive capsulitis. A flexed round needle is inserted inferior to the border of the scapular spine and advanced over the capsule on the surface of infraspinatus muscle-tendon fascia while an assistant simultaneously passively abducts the shoulder to full abduction.
- Subacromial release. A round needle is inserted on the skin over middle of supraspinatus and advanced under the acromion and acromioclavicular joint .
- Subcoracoid release. A needle is inserted on the skin over the lesser tubercle and advanced under the coracoid process sliding on the surface of the subscapularis muscle.

Fluoroscopy and ultrasonography were used to guide the needles and the article has some good anatomical diagrams and examples of imaging demonstrating needle placement along with clear explanations of how each procedure is performed. 5 ml of triamcinolone acetonide diluted with normal saline (0.4 mg/ml) was introduced along each microadhesiolysis route to prevent readhesion after the procedure. The solution was made by diluting one vial of triamcinolone acetonide (40 mg) with 100 ml normal saline.

Outcome measures were the self-rated pain score or severity, glenohumeral ROM and magnetic resonance imaging (MRI) of the affected shoulder. These measures were assessed before and after the intervention. The self-rated pain score or severity declined significantly ( $p < .01$ ), shoulder ROM increased significantly ( $p < .01$ ), and joint effusion in the affected shoulder decreased or disappeared in nine of ten patients on magnetic resonance imaging compared to their initial images.

**Effect of glucosamine sulphate on hip osteoarthritis: a randomized trial.**  
**Rozendaal RM, Koes BW, van Osch GJ, Uitterlinden EJ, Garling EH,**  
**Willemsen SP, Ginai AZ, Verhaar JA, Weinans H, Bierma-Zeinstra SM** *Annals*  
*of internal medicine* 2008 Feb 19;148(4):268-77. PMID: 18283204

The effectiveness of glucosamine for treating osteoarthritis is controversial. Given the prevalent use of glucosamine, definitive evidence about its effectiveness is needed. Most previous trials have studied only patients with knee osteoarthritis. Most available systemic osteoarthritis therapies show similar effectiveness in both hip and knee osteoarthritis. However, because the mechanism of action of glucosamine is still not known the possibility that glucosamine has different effects on the knee and hip cannot be eliminated. Differences in outcomes of studies may be partly due to it being available in 2 compounds glucosamine hydrochloride and glucosamine sulphate.

This study was a randomized, controlled trial to assess whether glucosamine sulphate has an effect on the symptoms and structural progression of hip osteoarthritis. 222 patients with hip osteoarthritis were recruited by their general practitioner. Patients were eligible if they met the American College of Rheumatology clinical criteria for hip osteoarthritis. Patients were randomly assigned to receive either 1500 mg of oral glucosamine sulphate administered once daily as two 750-mg tablets or placebo for 2 years.

Primary outcome measures were Western Ontario and McMaster Universities (WOMAC) pain and function subscales over 24 months and joint space narrowing after 24 months. The main secondary outcome measures were WOMAC pain, function, and stiffness after 3, 12, and 24 months. Use of pain medication was also recorded.

At baseline, both groups were similar in demographic and clinical variables. Overall, WOMAC pain and function and joint space narrowing did not differ after 24 months. Glucosamine sulphate was therefore not found to be more effective than placebo in modifying the symptomatic and radiographic progression of hip osteoarthritis over 24 months of daily therapy. Consideration needs to be given to the fact that 20 patients had total hip replacement during the trial and this could have affected the results.