

JACO

**Journal of the Academy of
Chiropractic Orthopedists**
2018



Volume 15

Issue 3

September 2018



JACO

Journal of the Academy of Chiropractic Orthopedists

The Open Access, Peer-Reviewed and Indexed Publication of
the Academy of Chiropractic Orthopedists
September 2018 – Volume 15, Issue 3

Editorial Board

Editor-In-Chief

Shawn M. Neff, DC, MAS, FACO

Managing Editor

Tracey A. Littrell, DC, DACBR, DACO, CCSP®

Associate Editors

James Demetrious, DC, FACO

David Swensen, DC, FACO

Alicia M. Yochum, RN, DC, DACBR, RMSK

Current Events Editor

James R. Brandt, DC, MS, FACO

Editorial Advisory Board

James R. Brandt, DC, MS, FACO

Ronald C Evans, DC, FACO

James Demetrious, DC, FACO

Michael Henrie, DO

Bruce Gundersen, DC, FACO

Editorial Review Board

Scott D. Banks, DC MS

Thomas F. Bergmann, DC

Jeffrey R. Cates, DC, FACO

Donald S. Corenman, MD, DC, FACO

Anthony Vincent D'Antoni, MS, DC, PhD

Daniel P. Dock, DC, FACO

Simon John Forster, DC, DABCO

Evan M. Gwilliam, DC, MBA

Nathan Hinkeldey, DC, DACRB

Scott Kilmer, DC, DABCO

Ralph Kruse, DC, FACO

Joyce Miller, DC, FACO

William E. Morgan, DC, DAAPM

Deanna O'Dwyer, DC, FACO

Joni Owen, DC, FACO

Christopher Roecker, DC, MS, DACO, DACSP

Roger Russell, DC, MS, FACO

Alec Schielke, DC

John Stites, DC, DACBR, DACO

Cliff Tao, DC, DACBR

Michelle A Wessely BSc, DC, DACBR

James A. Wyllie, DC DABCO

Alicia M. Yochum, RN, DC, DACBR, RMSK

Ward Beecher, D.C., FACO

Gary Carver, DC, FACO

Rick Corbett, DC, DACBR, FCCO(C)

Clinton Daniels, DC, MS, DAAPM

James Demetrious, DC, FACO

Neil L. Erickson, DC, DABCO, CCSP®

Jaroslav P. Grod, DC, FCCS(C)

Tony Hamm, DC, FACO

Dale Huntington, DC, FACO

Charmaine Korporaal, M.Tech: Chiropractic

Thomas Mack, DC, FACO

Loren C. Miller DC, FACO

Raymond S Nanko, DC, MD, DAAPM, FACO

Casey Okamoto, DC

Gregory C. Priest, DC, FACO

J Chris Romney, DC, FACO

Stephen M. Savoie, DC, FACO

Brandon Steele, DC

David Swensen, DC, FACO

John M. Ventura, DC, FACO

Michael R. Wiles, DC, MEd, MS

Steve Yeomans, DC, FACO

Journal of the Academy of Chiropractic Orthopedists

September 2018 – Volume 15, Issue 3

Editor's Desk

- ❖ Shawn M. Neff, DC, MAS, FACO

Original Articles

- ❖ Zeman J, Bonavito-Larragoite G: **Chiropractic Management of Bilateral Hip Pain in an Adult Male with Moderate Osteoarthritis in an Interdisciplinary Setting**; JACO 2018, **15(3)**:3-10

Abstracts and Literature Review

- ❖ Zeng X, Xie L, Qiu Z, Sun K: **Compression Neuropathy of Common Peroneal Nerve Caused By a Popliteal Cyst: A Case Report**; Reviewed by Ferstl JF. JACO 2018, **15(3)**:11-12
- ❖ Martin R, Martin HD, Kivlan BR: **Clinical Commentary Nerve Entrapments in the Hip Region: Current Concepts Review**; Reviewed by Corbett R. JACO 2018, **15(3)**:13-17

Radiology Corner

- ❖ Littrell TA: **Ostochondral Lesion in the Talus (OLT)**; JACO 2018, **15(3)**:18-21

Ortho Quiz

- ❖ Kleinfield SL: **Ortho Quiz**. JACO 2018, **15(3)**:22

Current Events

- ❖ Diplomate Examination Information
- ❖ Conferences

Answers to Ortho Quiz

- ❖ Check your knowledge on page 24

The Editor's Desk

Shawn M. Neff, DC, MAS, FACO
Editor-in-Chief

Welcome to the Fall 2018 issue of the Journal of the Academy of Chiropractic Orthopedists. School is back in session, cooler weather is moving in (in West Virginia) and the holidays will be upon us soon.



This month's picture is my family's Halloween picture from last year. We tend to go all out as a family and we are excited to debut this year's costume. I will share it to the Journal's Facebook page.

This is a great time for you our readers to like our Facebook page if you have not. You can find us at www.facebook.com/journalJACO/. While you are there feel free to upload your Halloween picture or any cases or orthopedic questions or comments for the journal or your colleagues.

I hope you all enjoy this issue.

Sincerely,

-Shawn

Chiropractic Management of Bilateral Hip Pain in an Adult Male with Moderate Osteoarthritis in an Interdisciplinary Setting

Jamie Zeman, DC¹, Gina Bonavito-Larragoite, DC, FIAMA²

¹Chiropractic Resident, Canandaigua VAMC

²Chiropractor, Iowa City VAMC

jamiezeman@gmail.com

Published: September 2018

Journal of the Academy of Chiropractic Orthopedists

September 2018, Volume 15, Issue 3

This is an Open Access article which permits unrestricted use, distribution, and reproduction in any medium, provided the original work is properly cited. The article copyright belongs to the author and the Academy of Chiropractic Orthopedists and is available at: <http://www.dorthoacademy.com>. © 2018 Zeman/Bonavito-Larragoite and the Academy of Chiropractic Orthopedists.

Abstract

There is limited evidence on interdisciplinary chiropractic care for conservative management of hip pain and osteoarthritis. The intention of this report is to describe the treatment and outcomes of a 75-year-old male with a primary complaint of chronic bilateral hip pain. History and examination led to a diagnosis of moderate bilateral hip osteoarthritis with associated segmental and somatic dysfunction and muscle spasm. As suggested by the patient's primary care provider the patient began trials of care with chiropractic and physical therapy concurrently, with treatment including spinal and extremity manipulative therapy, home exercises, and patient education. Following 6 weeks of care the patient appreciated a decrease in pain and reported improved function in activities of daily living. The patient responded well to a combination of chiropractic care, physical therapy, education and lifestyle recommendations. In this case, an

interdisciplinary approach to care was beneficial for the patient. One randomized control trial [1] was found which suggests manual therapies combined with patient education are effective in treating hip osteoarthritis, however more research needs to be done to determine long term efficacy.

Keywords: hip osteoarthritis, hip pain, interdisciplinary, chiropractic

Introduction

The purpose of this report is to present a case managing hip pain and osteoarthritis in an adult male patient seeking care within the Veterans Affairs Healthcare System with an interdisciplinary approach consisting of chiropractic care, physical therapy, and primary care.

Osteoarthritis (OA) of the femoral-acetabular joint is a joint disorder characterized by articular cartilage loss, osteophyte formation, and sclerosis at joint margins. Typical patient presentation is gradual onset of pain that is relieved with rest. Decreased internal rotation or pain increased on rotation when the knee is in full extension is a strong clinical indicator of osteoarthritis. [2]

The prevalence of hip osteoarthritis is approximately 5% in the population greater than or at 65 years of age, affecting women more than men. Common symptoms include joint pain and stiffness, however not all patients with hip OA are symptomatic. Risk factors included older age, history of hip injury, and excess body weight. It is more common in those with a history of femoral acetabular impingement, hip dysplasia, and rheumatoid arthritis. There is a higher incidence in those with a history of high-impact sports, especially running, and occupations with heavy lifting. [2]

Management of hip osteoarthritis focuses on decreasing pain and improving function. Evidence guidelines strongly recommend [2-4] patient education as part of treatment. Common non-pharmacologic interventions include orthotics, walking aids, aerobic exercise, muscle strengthening, and range of motion exercises. Pharmacologic intervention may include an NSAID regimen, weak opioids or narcotics, inter-articular corticosteroid injections, and joint replacement surgery or osteotomy if unresponsive to conservative treatment methods. [2]

There is limited research on management of hip osteoarthritis with chiropractic and integrative care. Typical treatment recommendations do not include chiropractic and acupuncture. There are

currently no recommendations regarding treatment protocol for management of hip pain with chiropractic care.

Case Presentation

The patient was a 75-year-old male veteran, 61 inches tall and 175 pounds with a BMI of 33.1. His past medical history was significant for type II diabetes, history of atrial fibrillation, hypertension, and hyperlipidemia, all well controlled, as well as a right total knee arthroplasty in 2005.

History revealed symptoms of chronic episodic bilateral hip pain, beginning several years prior, with periods of exacerbation typically lasting months out of the year. The most recent exacerbation occurred in Fall 2017, 2 months before his initial chiropractic consultation. He stated the pain is worse in the morning, during transitional movement such as sit-to-stand, when sleeping, during cold weather, and when initiating movement after a period of inactivity. The pain is relieved by taking Tylenol daily and applying the topical analgesic, BioFreeze. He described the quality of the pain as a nagging soreness with pins and needles. He described and pointed to the pain in the region of the buttocks and wrapping around the femoral-acetabular joint into the groin area bilaterally in what is known as a C sign pain distribution. [3] Patient denied radiation of symptoms into lower extremities and also denied changes in bowel or bladder function. He rated his pain as an average of 5/10 on a daily basis, with occasional pain levels of 7/10 at worst on a numerical pain rating scale where 0 is no pain and 10 is worst possible pain. Since onset the symptoms had become more constant and had increased slightly in intensity. Patient reported he experienced daily hamstring and calf cramps, which lasted a few minutes. He stated he had difficulty walking and donning socks. He reported drinking 2 cups of water per day, and sleeping 6.5 hours per night on either side.

Physical examination revealed blood pressure in the pre-hypertensive range, and all other vitals were within normal limits. Observation revealed antalgic gait with shortened stride and severely limited extension during terminal stance phase bilaterally. Posture analysis revealed an elevated left shoulder, left external foot flare, and moderate left genu varum. Palpatory findings included hypertonicity and tenderness along the iliopsoas, hamstring, calf, iliotibial band, and trochanters bilaterally. Active range of motion was mildly limited in lumbar extension with reported stiffness. Neurologic examination revealed deep tendon reflexes, myotomes, and sensory dermatomes were all within normal limits. Orthopedic test FABER demonstrated decreased

abduction with adductor tension bilaterally, and ipsilateral Yeoman's produced pain in the left groin and in the region of the left sacroiliac joint.

A five view radiograph series of bilateral hips including the pelvis obtained at the beginning of trial of care revealed prominent degenerative change to the lumbar spine and moderate bilateral arthritis of the hip with significant joint narrowing and osteophytosis, nearly symmetric. MRI of the lumbar spine revealed degenerative disc disease with multilevel central canal stenosis and neuroforaminal narrowing, worst at lower levels, and mild retrolisthesis of L3 on L4 and L4 on L5. There was no evidence of fracture, infection, or necrosis.

The clinical impression was bilateral hip pain with associated segmental and somatic dysfunction and muscle spasm, complicated by moderate osteoarthritis of the hips bilaterally, and history of right total knee arthroplasty with severe left knee genu varum.

Intervention and Outcome

Treatment protocol included chiropractic adjusting techniques: activator protocol once per week for 4 weeks initially with chiropractic evaluation and instrument assisted spinal manipulation when clinically indicated to the sacrum, pelvis, thoracic and lumbar spine, left tibia, and femoro-acetabular joints. The chiropractic treatment plan included supportive procedures of myofascial trigger point to iliopsoas, quadratus lumborum, and iliotibial band. The patient was given home care instructions to increase water intake to 8 cups per day, and prone lumbar extension to be performed twice each morning and evening, hold for 20 seconds. The chiropractic clinic also prescribed a contoured leg pillow to assist in comfort with side sleeping. Rehabilitative procedures were co-managed with physical therapist. The physical therapist prescribed the following home exercise plan: daily exercises of hamstring stretch 2x20 seconds, lunge hip flexor stretch 2x20 seconds, and figure 4 or seated piriformis stretch 2x20 seconds, along with every other day exercises of standing hip extension 3x10, and standing hip abduction 3x10 repetitions.

The patient reported no pain at the 4th and 5th follow up, 6 weeks after initiating chiropractic care and physical therapy. His nighttime muscle spasms ceased. The patient was discharged after 5 visits. The patient's gait improved, with slightly larger steps. As treatment progressed fewer segmental restrictions were noted, suggesting a positive response to treatment. The patient had improved ability to manage symptoms on his own. Of other interest, patient reported diabetes

finger prick tests were easier at time of discharge. Patient showed interest in yoga classes, and consult was placed, patient had not attended any yoga sessions at time this paper was written.

The PROMIS outcome measure used did not reflect improvement. Initial patient intake described pain when traversing stairs, walking for more than 15 minutes, shopping, and completing house chores. At time of discharge patient reported no pain during any activities of daily living. The Numerical Pain Rating Scale (NRS) and patient reported improvement in activities of daily living were the primary indicators of patient progress and indication for discharge.

Discussion

The patient responded well to a combination of chiropractic care, physical therapy, education, and lifestyle recommendations. It is hypothesized that manipulative therapy to the segments of the lumbar spine, pelvis, sacrum, and femoro-acetabular joint helped to increase motion and reduce stress on the femoro-acetabular joint, surrounding ligaments, and hip girdle musculature. The patient was compliant with home care recommendations. The contoured leg pillow served to mitigate femoro-acetabular impingement by reducing adduction and internal rotation during side sleeping. The patient reported subjective improvement in gait and lower extremity strength.

An article [4] reviewed the pain referral distribution pattern demonstrated by 109 patients with clinical and radiographically diagnosed hip osteoarthritis. The patients were given a numerical pain scale to rate their current pain and a mannequin to mark the location of their pain. Researchers found the most common regions marked where the greater trochanter (77%), the groin (53%), the anterior lateral thigh (42%), and the buttock region (38%). A small percent marked the knee and lower leg area. In this case study the patient presented with pain points over the greater trochanter bilaterally and myofascial trigger points in the gluteal region. The patient was instructed in a home exercise program including stretches for the iliotibial band and external hip rotators. It is possible the pain points the patient demonstrated were referrals from the femoro-acetabular region and not due to myofascial trigger points. However, in this case the potential benefit of addressing the muscular component as a potential contributor of symptoms was a reasonable management plan.

In a randomized controlled trial [1] researchers studied the effects of a patient education program with and without the use of manual therapy including trigger point muscular release and joint

manipulation by a chiropractor compared to a minimal control intervention group for the treatment of osteoarthritis in 119 patients. Patients were treated for six weeks with a one year follow up. The outcome measure was a checkbox numerical pain rating scale. Patient education was delivered by a physical therapist for five sessions. The chiropractic group included five education sessions with twelve chiropractic appointments. The comparison group was given stretches to complete at home. The authors concluded that manual therapy combined with patient education was more effective than patient education alone.

In this case study, each chiropractic patient visit included home care recommendations and education. The results of the RCT [1] helps to emphasize the effect of chiropractic treatment with the current case study. Manipulative therapy provided as part of this treatment plan may have contributed to the patient's positive response, and it is possible that the patient may not have responded as well to a treatment plan of home exercises and education alone.

An updated literature review [5] included 4 new clinical trials that studied treatment methods for osteoarthritis of the hip in addition to the UK Evidence report [6] regarding manual therapies. The updated studies included in the search criteria were chiropractic care with or without multimodal therapy, which may include physical rehabilitation, home exercises, education, and medicine. The authors concluded there was a fair level of evidence that manual therapy in combination with multi-modal therapies are effective for short term treatment of osteoarthritis of the hip. There is limited evidence to suggest that manual therapy in combination with multi-modal therapies are effective in long term treatment. The authors state there are few published studies that follow the patients long enough to determine the lasting benefit of manipulation for osteoarthritis of the hip.

A 2016 study by Beselga et al. [7] treated 40 adult patients with symptomatic osteoarthritis of the hip with intervention of mobilization with movement or a sham mobilization with movement. The outcomes studied were pain, orthopedic exam, and functional tests. For the intervention group, pain on the NRS decreased by 2 points, with clinically relevant increases in range of motion and improvements in functional tests. The short-term outcomes of this study were promising even though the sample size was small. Long term efficacy of this treatment was not measured in this study.

No manual mobilization with active or passive joint movement was utilized in this case study. Neither the chiropractor or physical therapist performed functional tests on this patient. Specific

functional tests could have been used as additional outcome tools as well as specific questionnaires targeting daily function.

This case study supports co-managing patients with bilateral hip pain related to osteoarthritis. Hip mobility is important for quality of life, patient mobility, and independence. Current research and clinical practice guidelines support education, home care recommendations, and physical therapy. There is limited research regarding the management of hip pain with chiropractic care specifically; however, some evidence does suggest manipulative therapy is palliative for femoro-acetabular pain. [5] Physical therapy and home care recommendations are common non-invasive and non-pharmacological forms of treatment, but chiropractic may be a promising addition or alternative to pain management and functional improvement.

Limitations

This case study was limited in duration of follow up. This patient was followed for 6 weeks before being discharged after being asymptomatic for 3 weeks. The initial examination and functional exam could have been more comprehensive for the purpose of tracking patient outcomes. As the patient in this case was treated with a multi-disciplinary care approach, it is not clear which intervention may have been the most beneficial or whether a synergistic effect may exist.

Future work on bilateral hip pain related to osteoarthritis could include proposed methods for a case-control study and randomized control study comparing chiropractic care alone, physical therapy alone, and a combination of physical therapy and chiropractic care for the management of hip pain and improving function. It would also be beneficial to develop a template for developing a case series of similar patients to create consistency in outcome measures including a standard questionnaire, functional and orthopedic exam, and radiographic criteria.

Conclusion

This case report may generate interest in the management of bilateral hip pain with conservative interdisciplinary care as a primary treatment protocol. In this case a combination of physical therapy and chiropractic care initiated by referrals from the primary care provider was an

effective form of treatment for bilateral hip pain related to moderate osteoarthritis in decreasing pain and improving function.

References

1. Poulsen E, Hartvigsen J, Christensen HW, Roos EM, Vach W, et al.: **Patient education with or without manual therapy compared to a control group in patients with osteoarthritis of the hip A proof-of-principle three-arm parallel group randomized clinical trial.** *Osteoarthritis Cartilage* 2013, **Oct 21**(10):1494-503. PubMed PMID: 23792189.
2. Aresti N, Kassam J, Nicholas N, Achan P: **Hip osteoarthritis.** *BMJ.* 2016 **Jul 6**:354:i3405.
3. Byrd T: **Evaluation of the Hip: History and Physical Examination.** *N Am J Sports Phys Ther.* 2007 **Nov 2**(4):231-240.
4. Poulsen E, Overgaard S, Vestergaard JT, Christensen HW, Hartvigsen J: **Pain distribution in primary care patients with hip osteoarthritis.** *Fam Pract.* 2016 **Dec 33**(6):601-606.
5. Brantingham JW, Bonnefin D, Perle SM, Cassa TK, Globe G, et al: **Manipulative therapy for lower extremity conditions: update of a literature review.** *J Manipulative Physiol Ther.* 2012 **Feb 35**(2):127-66.
6. Bronfort G, Haas M, Evans R, Leininger B, Triano J: **Effectiveness of manual therapies: the UK evidence report.** *Chiropr Osteopat.* 2010 **Feb 25**:18:3.
7. Beselga C, Neto F, Albuquerque-Sendín F, Hall T, Oliveira-Campelo N: **Immediate effects of hip mobilization with movement in patients with hip osteoarthritis: A randomised controlled trial.** *Man Ther.* 2016 **Apr 22**:80-5.

Editorial Review

Compression Neuropathy of Common Peroneal Nerve Caused By a Popliteal Cyst: A Case Report

Xiaobin Zeng, MD, Lifeng Xie, MD, Zhiqiang Qiu, MD, Kuo Sun, MD, PhD

[Medicine \(Baltimore\)](#). 2018 Apr; 97(16): e9922.

JACO Editorial Reviewer: Joseph F. Ferstl, DC, FACO

Published: September 2018

Journal of the Academy of Chiropractic Orthopedists

September 2018, Volume 15, Issue 3

The original article copyright belongs to the original publisher. This review is available from: <http://www.dorthoacademy.com> ©2018 Ferstl and the Academy of Chiropractic Orthopedists. This is an Open Access article which permits unrestricted use, distribution, and reproduction in any medium, provided the original work is properly cited.

Authors' Abstract:

Approximately 37 years ago the first report regarding the synovial cysts was written by Bamzai relating the cyst to chronic rheumatoid arthritis and later Baker called the synovial cyst in the leg a Bakers cyst.

The astute physician needs to understand the difference between a simple Bakers cyst or popliteal cyst in the posterior popliteal fossa versus a Bakers cyst or popliteal cyst that also encompasses the common peroneal nerve and causes compression at the lateral aspect of the head of the fibula. It is rare that a popliteal cyst will cause extra neural compression of the common peroneal nerve and cause serious complications. Compression neuropathy of the common peroneal nerve caused by a popliteal cyst is very rare. The paper goes on to state that a consultation with a patient which whom experienced lower leg numbness sensation especially over the lateral aspect of the left calf and the dorsum of the foot with no apparent weakness and pain noted. The patient denied any apparent history of trauma to the left calf. A positive Tinel sign was incited with tapping of the mass. There was no apparent muscle atrophy of the lower extremities on either side and neurological examination showed hypoesthesia over the dorsum of

the left foot and the lateral aspect of the left calf with normal knee joint motion. It was determined a surgical procedure was required to remove the popliteal cyst and it was found encased in about 6 cm of the left common peroneal nerve at the level of the fibula.

Conclusions: A popliteal cyst can compress various anatomical structures which would include synovial, meniscal, and ganglion cysts. The most frequent synovial popliteal cyst is generally considered to be a distension of the bursa.

Discussion or Conclusions: It is necessary to rule out a typical popliteal cyst from an extra neural popliteal cyst which is rarely encountered. This type of cyst is often related to a history of knee trauma and can cause entrapment of the peroneal nerve, part of the sciatica nerve.

Diagnosis: Standard plain film radiographs are of little use in demonstrating soft tissue lesions. Ultrasound may be useful in showing the cystic nature of the mass, but MRI can show in much better detail their size and internal contents as well as their relation with surrounding anatomical structures. The final diagnosis is established through aspiration of the popliteal mass which is much easier when the swelling is large. Generally surgical excision should be reserved only for those cases where more conservative interventions have failed and where there is significant functional impairment that can be ascribed to the cysts.

JACO Editorial Summary:

The purpose of this study was to demonstrate that a common peroneal nerve compression is rarely caused by an extra neural popliteal cyst, but astute physicians should keep in mind the difference between a true sciatica arising out of the lumbar spine versus nerve entrapment extra neural popliteal cyst.

Clinical Commentary
Nerve Entrapments in the Hip Region:
Current Concepts Review

Robroy Martin, PhD PT, Hal David Martin, DO, Benjamin R. Kivlan, PhD PT

International Journal of Sports Physical Therapy 2017 12:7 1163-73

JACO Editorial Reviewer: Richard Corbett D.C.

Published: September 2018

Journal of the Academy of Chiropractic Orthopedists

September 2018, Volume 15, Issue 3

The original article copyright belongs to the original publisher. This review is available from: <http://www.dorthoacademy.com> ©2018 Corbett and the Academy of Chiropractic Orthopedists. This is an Open Access article which permits unrestricted use, distribution, and reproduction in any medium, provided the original work is properly cited.

Authors' Abstract:

The purpose of this clinical commentary is to review the anatomy, etiology, evaluation, and treatment techniques for nerve entrapments of the hip region. Nerve entrapment can occur around musculotendinous, osseous, and ligamentous structures because of the potential for increased strain and compression on the peripheral nerve at those sites. The sequela of localized trauma may also result in nerve entrapment if normal nerve gliding is prevented. Nerve entrapment can be difficult to diagnose because patient complaints may be similar to and coexist with other musculoskeletal conditions in the hip and pelvic region. However, a detailed description of symptom location and findings from a comprehensive physical examination can be used to determine if an entrapment has occurred, and if so where. The sciatic, pudendal, obturator, femoral, and lateral femoral cutaneous are nerves that can be entrapped and serve a source of hip pain in the athletic population. Manual therapy, stretching and strengthening exercises, aerobic conditioning, and cognitive-behavioral education are potential interventions. When conservative treatment is ineffective at relieving symptoms surgical treatment with neurolysis or neurectomy may be considered.

Level of Evidence: 5

Key words: Anatomy, etiology, evaluation, hip, nerve entrapment, treatment

Methods: This article reviews the anatomy, etiology, evaluation and treatment techniques for peripheral nerve entrapments of the hip and pelvic regions.

The sciatic and pudendal nerves are reviewed with respect to posterior nerve entrapment. The obturator, femoral and lateral femoral cutaneous nerves are reviewed with respect to anterior nerve entrapment:

Results: The article discusses the concept of nerve gliding. Normal nerve gliding may be disrupted by localized trauma.

Some of the mechanisms through which peripheral nerve entrapment negatively affects nerve function are identified as: changes in vascular permeability, impairment of axonal transport, and the formation of edema.

Posterior Nerve Entrapments: A summary of the common locations of posterior hip and pelvis nerve entrapments and key subjective findings and signs are presented in this table (Table 1 of the article):

Posterior Hip and Pelvis Nerve Entrapments

Involved Nerve	Common Site of Entrapment	Key Signs and/or Symptoms
Sciatic	Piriformis and obturator internus/gemelli complex	Positive seated piriformis stretch and/or active piriformis tests
	Proximal Hamstring	Ischial tenderness Pain in the posterior thigh to the popliteal fossa aggravated with running
	Lesser trochanter and ischium	Positive ischial femoral impingement test
Pudendal	Ischial spine, sacrospinous ligament and lesser sciatic notch entrance	Pain medial to ischium
	Greater sciatic notch and piriformis	Sciatic notch tenderness and piriformis muscle spasm and tenderness
	Alcock's canal and obturator internus	Obturator internus spasm and tenderness

Anterior Nerve Entrapments: A summary of the common locations of anterior hip and pelvis nerve entrapments as well as subjective findings and signs are also presented in Table 1 of the article:

Anterior Hip and Pelvis Nerve Entrapments (* added for clarity)

Involved Nerve	Common Site of Entrapment	Key Signs and/or Symptoms
Obturator	Obturator canal	Pain in medial thigh (*exercise-induced)
	Adductor muscle fascia	Aggravation with movement into abduction
Femoral	Beneath iliopsoas tendon	Reproduction of symptoms with modified Thomas test position
	Inguinal ligament	Quadriceps muscle weakness (*quadriceps atrophy if severe)
	Adductor canal (*with involvement of saphenous branch)	Pain in the anteromedial knee joint, medial leg, and foot
Lateral Femoral Cutaneous	Inguinal ligament	Positive pelvic compression test (* & Tinel's Sign)

Conservative Treatment: Conservative treatment strategies for nerve entrapments have not been well-studied.

A list of conservative treatment strategies would include neural gliding or nerve mobilization, manual therapy, soft tissue mobilization in conjunction with active patient movement, stretching and strengthening exercises, massage, aerobic conditioning, and cognitive-behavioral education.

Those physical techniques listed in the previous paragraph attempt to improve neurodynamics by restoring the balance between the relative movements of the nerve and surrounding structures.

Soft-tissue mobilization using active patient movement along with specialized instruments in treatment administration may be used to induce biological changes to affect scar tissue and to stimulate the regeneration of soft tissues. These techniques may also try to mechanically mobilize tissues that are restricting nerve gliding.

The hypothesized benefits from neural gliding or nerve mobilization techniques include facilitation of nerve gliding, reduction of nerve adherence, dispersion of noxious fluids, reduction of intraneural edema, increased neural vascularity, and improvement of axoplasmic flow.

Treatment goals are: to increase range of motion, reduce pain, decrease swelling, increase flexibility, and/or improve muscle performance.

Surgical Treatment: Surgical treatment with neurolysis or neurectomy may be considered when conservative treatment, including injections, is ineffective at relieving symptoms associated with nerve entrapment.

Conclusions: Nerve entrapments should be considered as a potential generator of extra-articular symptoms in athletes with hip or pelvic pain.

Symptom location combined with physical examination findings can be used to identify the site of nerve entrapment.

Treatment strategies include physical measures as well as cognitive-behavioral education.

Surgical treatment may be considered in those with recalcitrant symptoms.

Clinical Relevance: Chiropractors often see athletes (as well as non-athletes) with hip and /or pelvic pain.

This paper is of value in the differential diagnosis of patients with hip and/or pelvic pain.

JACO Editorial Summary:

- Posterior and anterior hip nerve entrapments may be causes of pain in the athletic population.
- The similarity in symptoms, and potential co-existence with other musculoskeletal conditions can cloud the process of identification of nerve entrapments in the hip and pelvic region.
- Common nerve entrapments in the hip and pelvis in athletes may involve the sciatic, pudendal, obturator, femoral, and lateral femoral cutaneous nerves.
- Clinicians need to be aware of the potential location, clinical presentation, and treatment options for nerve entrapments in the hip and pelvic region.
- Examination for Posterior Nerve Entrapments: For those with potential posterior nerve entrapments, examination should include the seated palpation test, the seated piriformis stretch, the active piriformis test, the ischio-femoral impingement test, and the active knee flexion test.
- For those with suspected pudendal nerve entrapment, careful palpation should be performed for tenderness at the greater sciatic notch near the proximal aspect of the piriformis and medial to the ischium near the sacrospinous and sacrotuberous ligaments, the obturator internus muscle, and pudendal canal.
- Examination for Anterior Nerve Entrapments: Patients with obturator nerve entrapment may have medial thigh symptoms which are aggravated by stretching with hip abduction and slight extension, but the symptoms are not aggravated by resisted adduction.
- Quadriceps muscle weakness may be present in patients with femoral nerve entrapment. Should the entrapment be severe, quadriceps muscle atrophy will be present, often with

an absent patellar tendon reflex. Passive hip extension and knee flexion may reproduce the symptoms in femoral nerve entrapment.

- Lateral femoral cutaneous nerve entrapment may be identified by a positive pelvic compression test and Tinel's sign.

The reader is referred to the original article for a complete description of these tests.

Summary: This is a helpful review of potential nerve root entrapments in the posterior and anterior hip and pelvis.

Radiology Corner

Osteochondral Lesion of the Talus (OLT)

Tracey A. Littrell, DC, DACBR, DACO, CCSP

Published: September 2018
Journal of the Academy of Chiropractic Orthopedists
September 2018, Volume 15, Issue 3

This is an Open Access article which permits unrestricted use, distribution, and reproduction in any medium, provided the original work is properly cited. The article copyright belongs to the author and the Academy of Chiropractic Orthopedists and is available at: <http://www.dcorthoacademy.com>. © 2018 Littrell and the Academy of Chiropractic Orthopedists.



AP Ankle

Oblique Ankle



Lateral Ankle

Case

A 48-year-old female patient reported persistent mild ankle pain and stiffness to her chiropractor approximately 6 weeks following an incident she described as “rolling” her ankle when stepping off a curb. The patient’s activities of daily living were minimally impacted by her symptoms; she reported her symptoms as “annoying” and “achy” following walking.

The dorsoplantar (anteroposterior) and oblique ankle radiographs revealed an ovoid lucent defect with a well-defined inferior sclerotic border in the superior-medial talar dome; the lateral ankle radiograph revealed a subtle surface depression at the superior-posterior talus. No osseous fragmentation and no soft tissue edema was identified. A large calcaneal heel spur was noted at the insertion of the plantar aponeurosis.

Discussion

Osteochondral lesion(s) of the talus (OLT) is an all-encompassing term for any injury involving both the subchondral bone and the articular cartilage of the talar dome, including bone bruise (contusion), osteochondritis dissecans, and osteochondral fracture.¹ With such an expansive categorization, OLT may occur in up to 70% of acute ankle sprains and fractures.² Prior to the availability of cartilage-sensitive advanced imaging procedures, OLT was often not recognized unless the radiographic findings were pronounced or the patient underwent surgery for complications associated with the causative injury. The most common cause of OLT is trauma, but congenital variants and malformations, ligamentous laxity due to connective tissue disease or prior trauma, and conditions or treatments that carry an increased risk for osteonecrosis are also known etiologies for OLT.²

The physician should have a high index of suspicion when a seemingly typical ankle injury doesn't heal as she or he expected. Most patients with OLT report non-specific ankle region symptoms and few significant alterations of daily living activities. Patients most frequently report ankle swelling, stiffness, and/or weakness, particularly following prolonged activity, such as standing, walking, running, or other weight-bearing activities.^{1,2} Physical examination of the patient with OLT may be frustratingly non-specific, with many patients demonstrating poorly localized symptoms to palpation or provocative examination. Positive responses to anterior drawer tests, inversion and eversion testing, and findings of ligamentous laxity and hindfoot malalignment may be present, not necessarily as consequences of OLT, but as risk factors that proceed the ankle injury with the complication of OLT.^{1,2}

When OLT is suspected, well-positioned weight-bearing dorsoplantar (anteroposterior), oblique, and lateral radiographs are useful in revealing fracture, joint misalignment, and osteoarthritis, but are not sensitive to OLT, with estimates of 50-70% of cases missed with radiographic evaluation.^{1,2} Computed tomography (CT) is an excellent tool for the assessment of cortical injury, comminution, osteophytes, and loose bodies; but CT fails to give the necessary details of cartilaginous injuries. Magnetic resonance imaging (MRI) is the procedure of choice for assessing suspected OLT. MRI is sensitive to bone marrow edema and cartilaginous trauma.

Treatment for OLT may be conservative or surgical. Conservative treatment with rest, restricted activities, joint immobilization, and weight-bearing as tolerated may be effective for up to half of

asymptomatic patients. Surgical interventions consist primarily of bone marrow stimulation procedures for lesions with diameters less than 15 mm, and replacement procedures (cartilage autografts from the patient's own knee), for larger lesions.¹

As this patient's OLT was symptomatic and her activities of daily living were impacted, she was referred for orthopedic surgical consultation and underwent an osteochondral autograft.

1. Posadzy, M., Desimpel, J. & Vanhoenacker, F.M. (2017). Staging of Osteochondral Lesions of the Talus: MRI and Cone Beam CT. *Journal of the Belgian Society of Radiology*, 101(S2), 1. DOI: <http://doi.org/10.5334/jbr-btr.1377>
2. Gianakos, A. L., Yasui, Y., Hannon, C. P., & Kennedy, J. G. (2017). Current management of talar osteochondral lesions. *World Journal of Orthopedics*, 8(1), 12–20. <http://doi.org/10.5312/wjo.v8.i1.12>

Ortho Quiz

by Steven L. Kleinfield DC, FACO

1. The name of the Orthopedic Test in which the examiner passively spreads the patient's fingers apart and then asks the patient to bring their fingers together again while looking to see if the little finger can actually squeeze is called:
 - a. Pinch Grip Test
 - b. Tinel's Test
 - c. Wartenberg's Sign
 - d. Froment's Sign

2. In the ankle, the term: Supination is synonymous with which of the following terms:
 - a. Inversion
 - b. Eversion
 - c. Dorsiflexion
 - d. Plantarflexion

3. In the ankle, the term: Pronation is synonymous with which of the following terms:
 - a. Inversion
 - b. Eversion
 - c. Dorsiflexion
 - d. Plantarflexion

4. What ligament is torn in an eversion injury to the ankle:
 - a. Anterior Talo-Fibular Ligament
 - b. Posterior Talo-Fibular Ligament
 - c. Deltoid Ligament
 - d. Talo-Navicular Ligament

5. Strunsky's Test is considered a Classic Orthopedic Test used to evaluate for the presence of what condition:
 - a. Metatarsalgia
 - b. Cuboid subluxation
 - c. Achilles Tendon Rupture
 - d. Anterior Talo-Fibular Ligament Laxity

Current Events

- ❖ The Part II examination will be given November 8-10, 2018. Apply on the Academy website: <http://dcorthoacademy.org/>
- ❖ Apply for the Lipe Scholarship
Details at <http://www.accoweb.org/lipescholarship.html>
- ❖ The full hours of the following conventions have been accepted by the Academy as qualifying for re-credentialing.
 - American College of Chiropractic Orthopedists
2019 Orthopedic Essentials Seminar
April 25-27, 2019
Tropicana Las Vegas in Las Vegas, Nevada
- ❖ Other conferences of interest:
 - NCLC
January 16-19, 2019
Omni Shoreham Hotel
Washington, D.C
 - ACC RAC 2019
March 14-16, 2019
Marriot Waterfront
Baltimore, MD

Answers to Ortho Quiz

1. The name of the Orthopedic Test in which the examiner passively spreads the patient's fingers apart and then asks the patient to bring their fingers together again while looking to see if the little finger can actually squeeze is called:

c. **Wartenberg's Sign**

Orthopedic Physical Assessment by David McGee 4th Edition pg: 337

2. In the ankle, the term: Supination is synonymous with which of the following terms:

a. **Inversion**

www.sportsinjuryclinic.net/sport-injuries/foot-heel-pain/supination

3. In the ankle, the term: Pronation is synonymous with which of the following terms:

b. **Eversion**

www.hyperpronation.com/

4. What ligament is torn in an eversion injury to the ankle:

c. **Deltoid Ligament**

www.sportsinjuryclinic.net/sport-injuries/ankle-achilles-shin-pain/eversion-ankle-sprain

5. Strunsky's Test is considered a Classic Orthopedic Test used to evaluate for the presence of what condition:

a. **Metatarsalgia**

Orthopedic Testing: A Rational Approach to Diagnosis: Gerard and Kleinfield pg: 608