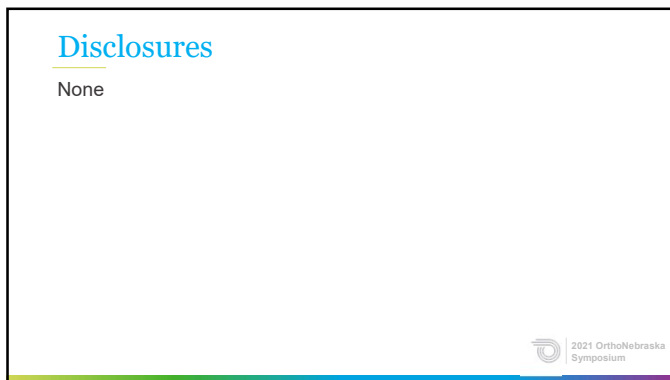
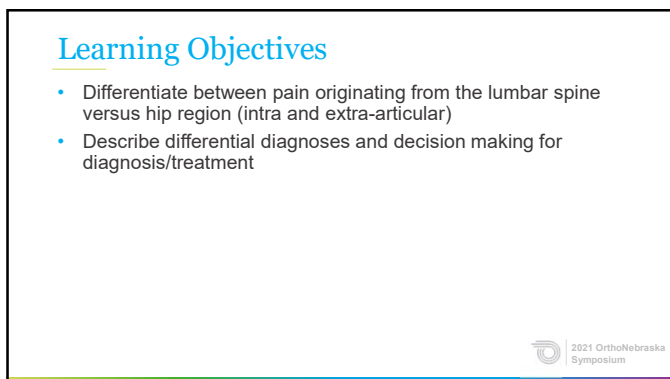




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3

About Me

Hometown: Omaha, NE

Undergraduate: Nebraska Wesleyan University; Biology, Chemistry, Psychology

Graduate School (MS): Creighton University; Clinical Anatomy


Medical School (MD): Creighton University

Residency: University of Nebraska Medical Center; Orthopaedic Surgery

Fellowship: University of Pittsburgh Medical Center

- Spine Surgery Fellowship (Orthopaedic Surgery Department)
- Spine decompression (disc, stenosis), fusion, disc arthroplasty (neck), trauma, tumor, infection, spinal deformity

Joined  OrthoNebraska in 2019

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4



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5

Differential Diagnoses

Differential Diagnoses for Hip, Spine, and Other Pathologies That May Mimic One Another			
Intra-articular Hip Pathologies	Extra-articular Hip Pathologies	Spinal Pathologies	Other Pathologies
Hip osteoarthritis	Stress fracture	Lumbar stenosis with or without spondylolisthesis	Sacroiliac joint pathology
Septic arthritis	Greater trochanteric bursitis	Lumbar disk herniation	Sciatic nerve tumor
Stress fracture	Iliotibial band tendinitis	Foraminal stenosis	Intrapelvic tumors
Osteonecrosis	Gluteus medius or gluteus minimus tear	Facet cyst	Insufficiency fracture of the sacrum
Failed total hip arthroplasty	Iliopsoas tendinitis	Nerve-root sheath tumor	Peripheral vascular diseases (including Leriche syndrome)
Labral tear	Coxa saltans (internal or external snapping hip)	Spondylolysis and isthmic spondylolisthesis	Osteitis pubis
Femoroacetabular impingement	Perforator syndrome	Iatrogenic causes (ie, misplaced pedicle screw)	Paget disease
Loose bodies (synovial chondromatosis, pigmented villonodular synovitis, osteochondritis dissecans)	Subgluteal space syndromes (deep gluteal, hamstring pathology, pudendal nerve, and ischiofemoral impingement)	Sagittal spinal malalignment	Peripheral neuropathy
Chondral damage	Adductor strain	Proximal pathology (abscess, hematoma, malpositioned hardware, transposas approach)	Shingles
Capsular laxity	—	—	Meralgia paresthetica
Ligamentum teres rupture	—	—	Sports hernia

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6

Differential Diagnoses

Differential Diagnoses for Hip, Spine, and Other Pathologies That May Mimic One Another

Intra-articular Hip Pathologies	Extra-articular Hip Pathologies	Spinal Pathologies	Other Pathologies
Hip osteoarthritis	Stress fracture	Lumbar stenosis with or	Sacroiliac joint pathology
<ul style="list-style-type: none"> trochanteric bursitis vitellodular synovitis, osteochondritis desiccans) 	<ul style="list-style-type: none"> trochanteric bursitis pathology, pudendal nerve, and ischiofemoral impingement) 	<ul style="list-style-type: none"> Psoas pathology (abscess, hematoma, malpositioned hardware, transpos approach) 	<ul style="list-style-type: none"> Shingles Meralgia paresthetica Sports hernia
Chondral damage	Adductor strain		
Capsular laxity	—	—	—
Ligamentum teres rupture	—	—	—

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7

Why?

- Fortunately, following an appropriate diagnosis, most patients find improvement in spine/hip pain without requiring surgery
- Lumbar spine and hip diseases have potential to cause debilitating pain, limiting physical function in everyday activities
- Total Hip Arthroplasty: "Operation of the 20th Century"
- In appropriately selected patients, lumbar spinal surgery (●) has demonstrated long-term improvement over non-surgical treatment (▲)

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8

Hip and Spine Pathology

Hip

- Muscle/tendon strain
- Capsular strain or laxity
- Labral tear
- Avascular necrosis
- Stress fracture
- Hip impingement (FAI)
- Trochanteric bursitis
- Hip flexion contracture
- Abductor strain/tear
- Hip arthritis
- Snapping hip
- Osteochondritis Desiccans
- Adductor strain

Spine

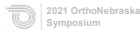
- Intervertebral disc herniation
- Muscle/tendon strain
- Facet overload
- Spinal stenosis (narrowed space for nerves)
- Radiculopathy
- Foraminal stenosis
- Spondylosis
- Spondylolisthesis
- Facet cyst
- Sagittal malalignment
- Osteodiscitis
- Pars fracture/spondylolysis
- Lumbosacral transitional vertebrae

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9

Outline

- Cases
- Anatomy
- Terminology
- Symptoms/Presentation
- History and Physical
 - Objectives: Differential Dx
- Radiology – XR
- Radiology – Other tests
- Treatment
 - Diagnostics/Injections
 - Physical Therapy
 - Surgery



10

Cases

- Spine
- Hip
- Spine? Hip? Both?



11

Case #1

- Patient reports history of occasional low back pain
- Three weeks of "shooting" pain in hip/buttock, thigh, leg and tingling in foot.
 - "Sciatica?"
- Worsened with attempts at stretching, exercise, sitting



12

Case #2

- Patient reports history of occasional low back pain
- Three weeks of "sharp" pain in hip/groin, thigh, without tingling in legs or feet
- Has felt hips becoming "stiff" over time, noticed when sitting for longer periods, getting dressed, shoes/socks
- Worsened with attempts at stretching, exercise, sitting



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13

Case

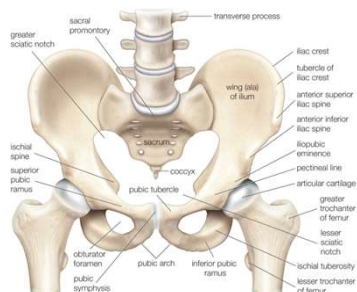
- Patient reports history of occasional low back pain
 - Has become more consistent over last several months
- Three months of "aching" pain in groin/buttock/outside of hip, occasional pain in thigh, leg and tingling in feet
- Feels hips become "stiff" with sitting, back, hips and thighs "tired" with prolonged walking
 - Sometimes, increased activity seems to "loosen things up"
- Worsened with attempts at stretching, exercise, sitting
- Decreased overall activity last several months
- Tried physical therapy – initially better, now worse than before



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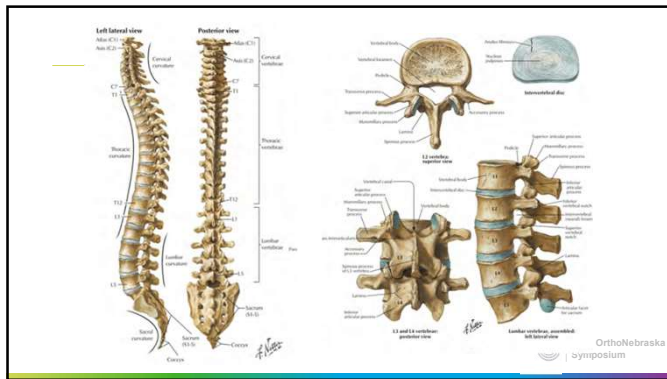
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Anatomy – Pelvis/Hip

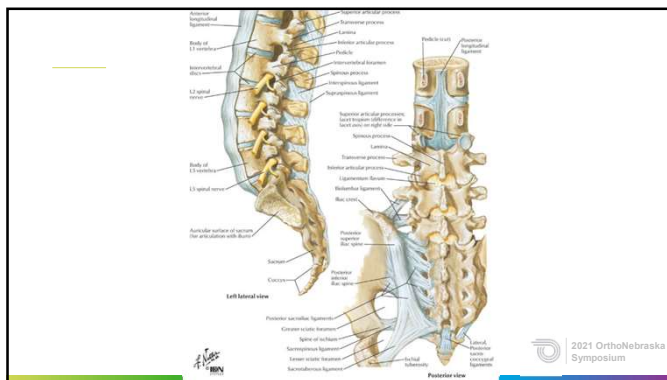


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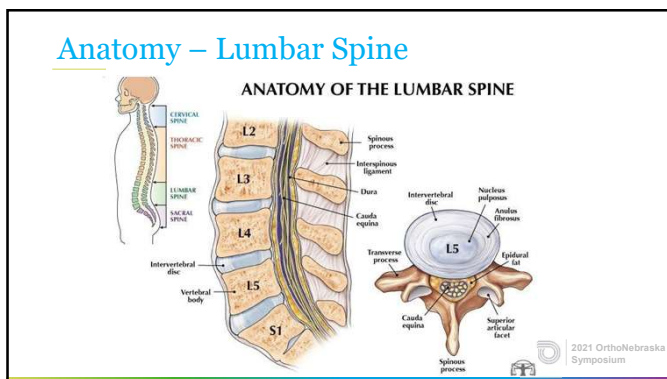
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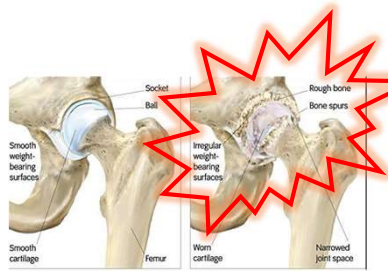
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18

Terminology

- **Arthritis**
- Disc bulge, protrusion, herniation, prolapse, etc.
- Spinal Stenosis

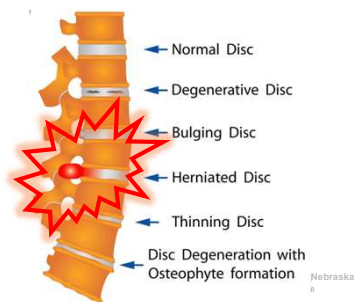


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19

Terminology

- Arthritis
- **Disc bulge, protrusion, herniation, prolapse, etc.**
- Spinal Stenosis



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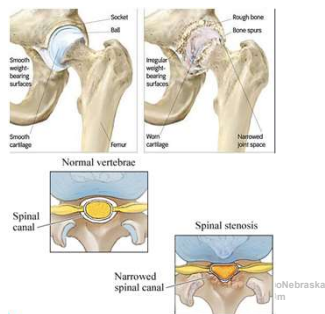
20

Terminology

Arthritis
Disc bulge, protrusion, herniation, prolapse, etc

Spinal stenosis

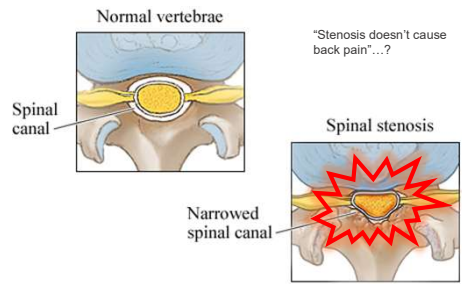
- Arthritis + disc degenerative changes → *relative narrowing of space available for nerves/spinal cord*



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21

Terminology



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22



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23

Symptoms/Presentation

Spine/Nerve

- "Shooting" pain
- "Electric" pain
- Numbness/tingling
- Radiating pain → hip to thigh and leg
- Weakness in one or both thighs/legs
- Heaviness in legs when walking, improved with sitting
- Leaning forward while walking
- Increased pain with stretching

Spine/Hip

- Lumbar/back pain
- Hip/groin pain
- Limited range of motion
- Increased pain with activity
- Increased pain with sitting
- Thigh pain/fatigue

Hip/Joint

- Groin pain
- Lateral/side of hip pain
- Increased with side lying
- Increased with thigh rotation
- "Antalgia" or limp secondary to pain when walking/standing
- "Lurch" or hip dropping while walking

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24

Symptoms/Presentation

Spine/Nerve

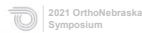
- "Shooting" pain
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- "Lurch" or hip dropping while walking



25

Symptoms/Presentation

Spine/Nerve

- "Shooting" pain
- "Electric" pain
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- Leaning forward while walking
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Spine/Hip

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- Increased pain with activity
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- Thigh pain/fatigue

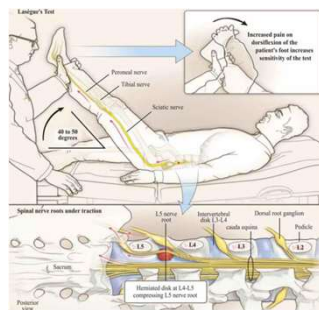
Hip/Joint

- Groin pain
- Lateral/side of hip pain
- Increased with side lying
- Increased with thigh rotation
- "Antalgia" or limp secondary to pain when walking/standing
- "Lurch" or hip dropping while walking



26

Straight Leg Raise Test



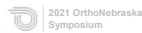
"Shopping Cart Sign"



27

History and Physical

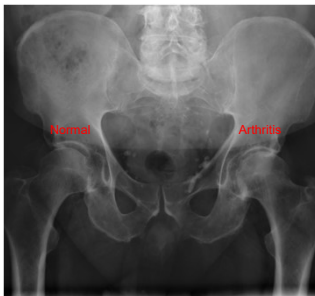
- Standing Alignment
- Walking Pattern
- Hip and Back Range of Motion
- Muscle Strength – Hips/Knees/Ankles
- Nerve Sensation – Thighs/legs/feet + Reflexes
- Tenderness to Palpation/Pressure
- Arterial Pulses



28

Radiology – X Ray

Hip



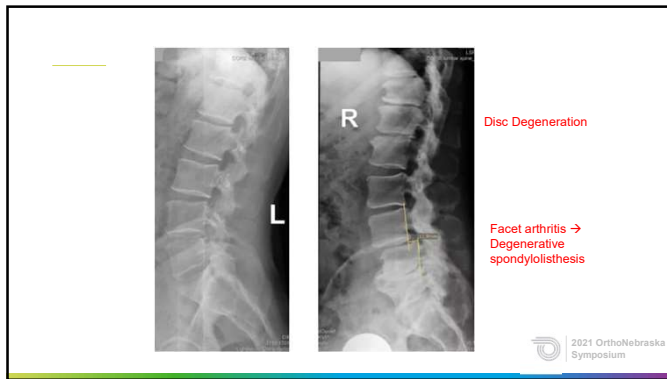
29

Radiology – X Ray

Lumbar Spine



30



31

Radiology – Other Tests

- MRI – Soft Tissue Detail
 - Hip
 - Assess labrum/capsule, tendons, cartilage
 - Spine
 - Assess discs, nerves, stenosis
- CT Scan – Bone Detail
 - Assess for fracture, fusion, arthrosis/calcification
- DEXA Scan
 - Assess for bone health: osteopenia, osteoporosis
- Radionucleotide Scan
 - Assess for fracture, infection, tumors

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32

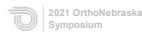
Radiology - MRI

Lumbar MRI

33

Treatment

- Medications
 - Acetaminophen
 - Non-steroidal medications: Ibuprofen, naproxen, meloxicam
 - Neuromodulatory medications: gabapentin, pregabalin, duloxetine
 - Differential Dx
 - Steroids: prednisone, methylprednisolone
 - Topical: Lidocaine, Salonpas, ice/heat
- Physical Therapy
- Injections
- Surgery



34

Physical Therapy

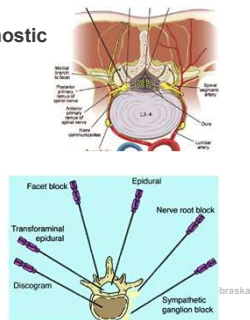
- First line of treatment, often with medication (NSAIDs – naproxen, ibuprofen)
- Strong evidence to support hands-on Physical Therapy assessment/treatment and home program with therapeutic "exercise"
- Used in favor of, prior to, immediately after, and when recovering from surgery
- "How long is Physical Therapy?"



35

Diagnostics/Injections

- We both want **therapeutic AND diagnostic**
 - Physiatry/Interventional Spine
 - Anesthesia/Pain
 - Radiology
- Hip
 - Joint/intra-articular injections
 - Tendon and bursa injections
- Spine
 - "Epidural"
 - Interlaminar vs Transforaminal
 - Nerve Root Blocks
 - Facet Joint Injections
 - Medial Branch Blocks



36



37

Surgery – Indications are Key


<u>Hip</u>	<u>Spine</u>
Preservation <ul style="list-style-type: none"> • Hip Arthroscopy • Hip/pelvic osteotomy 	Decompression <ul style="list-style-type: none"> • Discectomy • Laminectomy • Foraminotomy
Reconstruction <ul style="list-style-type: none"> • Hip Resurfacing • Total Hip Replacement or Total Hip Arthroplasty 	+/- Fusion (with Decompression) <ul style="list-style-type: none"> • Anterior • Posterior • Interbody
	+/- Realignment <ul style="list-style-type: none"> • Osteotomy + Fusion

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38



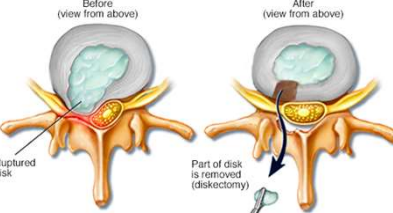
39



- Patient reports history of occasional low back pain
- Three weeks of "shooting" pain in hip/buttock, thigh, leg and tingling in foot.
 - "Sciatica?"
- Worsened with attempts at stretching, exercise, sitting


40

Lumbar Disc Herniation with Radiculopathy



- Patient reports history of occasional low back pain
- Three weeks of "shooting" pain in hip/buttock, thigh, leg and tingling in foot
- Worsened with attempts at stretching, exercise, sitting
- Medications, PT, Injections
- **Microdiscectomy – outpatient surgery**

41

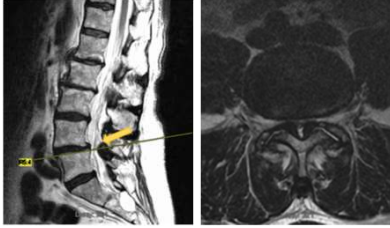


- Patient reports history of occasional low back pain
 - Has become more consistent over last several months
- Three months of "aching" pain in groin/buttock/outside of hips, occasional pain in thighs, legs and tingling in feet
- Feels hips become "stiff" with sitting, back, hips and thighs "tired" with prolonged walking
 - Sometimes, increased activity seems to "loosen things up"
- Worsened with attempts at stretching, exercise, sitting
- Decreased overall activity last several months
- Tried Physical Therapy – initially better, now worse than before

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42

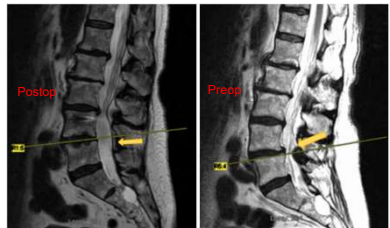
L4-5 Degenerative Spondylolisthesis with Stenosis



- Patient reports history of occasional low back pain
 - Has become more consistent over last several months
- Three months of "aching" pain in groin/buttock/outside of hips, occasional pain in thighs, legs and tingling in feet
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- Sometimes, increased activity seems to "loosen things up"
- Worsened with attempts at stretching, exercise, sitting
- Decreased overall activity last several months
- Tried Physical Therapy – initially better, now worse than before
- **Additional physical therapy, medications, and injections**

43

L4-5 Degenerative Spondylolisthesis with Stenosis



- Patient reports history of occasional low back pain
 - Has become more consistent over last several months
- Three months of "aching" pain in groin/buttock/outside of hips, occasional pain in thighs, legs and tingling in feet
- Feels hips become "stiff" with sitting, back, hips and thighs "tired" with prolonged walking
 - Sometimes, increased activity seems to "loosen things up"
- Worsened with attempts at stretching, exercise, sitting
- Decreased overall activity last several months
- Remains symptomatic with pain upon walking, using cane/walker and increasingly limited in activity
- **L4-5 laminectomy (decompression) +/- fusion – inpatient surgery**

44

Literature

Instructional Course Lecture

Differentiating Hip Pathology From Lumbar Spine Pathology: Key Points of Evaluation and Management

Aaron J. Buckland, MBBS, FRACS
Ryan McNamee, MD
Rahab D. Patel, MD
James Slone, MD, MS
Abbas E. Razi, MD

Abstract
The diagnosis and treatment of patients who have both hip and lumbar spine pathologies may be a challenge because overlapping symptoms may delay a correct diagnosis and appropriate treatment. Common complaints of patients who have both hip and lumbar spine pathologies include low back pain with associated buttock, groin, thigh, and, possibly, knee pain. A thorough patient history should be obtained and a complete physical examination should be performed in these patients to identify the primary source of pain. Plain and advanced imaging studies and diagnostic injections can be used to further delineate the primary pathology and guide the appropriate sequence of treatment. Both the surgeon and the patient should understand that, although one pathology is managed, the management of the other pathology may be necessary because of persistent pain. The recognition of both entities may help reduce the likelihood of misdiagnosis, and the management of both entities in the appropriate sequence may help reduce the likelihood of persistent symptoms.

Buckland, Aaron J. MBBS, FRACS, MSc; Ryan McNamee, MD; Patel, Rahab D. MD; Slone, James M. MD; Razi, Abbas E. MD Differentiating Hip Pathology From Lumbar Spine Pathology: Key Points of Evaluation and Management. *Journal of the American Academy of Orthopedic Surgeons*. February 2017. Volume 30, Number 2, e1-e7.

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45

Literature

REVIEW

Differentiating Radiculopathy from Lower Extremity Arthropathy

Steven F. DeFroda, MD,* Alan H. Daniels, MD,* Matthew E. Davis, MD*

*Department of Orthopaedics, Alpert Medical School of Brown University, Providence, RI; *Division of Spine Surgery, Department of Orthopaedics, Alpert Medical School of Brown University, Providence, RI

ABSTRACT

Low back and lower extremity pain are among the most common complaints encountered by physicians. Differentiating pain due to primary extremity pathology versus lumbar radiculopathy can be challenging. Careful physical examination and appropriate imaging with plain radiographs and advanced studies is needed as important in determining the cause of lower extremity complaints. Overutilization of advanced imaging may reveal otherwise asymptomatic spinal pathology and can lead to an incorrect diagnosis. In patients in whom surgical intervention is being considered by a spine or orthopedic surgeon, intra-articular or epidural steroid injections may help to reveal the underlying cause of pain in the absence of significant spinal pathology. Additionally, patients presenting with vague lower extremity pain after recent or distant joint arthroplasty should be considered for potential failure or infection of their implant before assuming the symptoms are coming from the lumbar spine.

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KEYWORDS: back pain; hip pain; Chronic/recurrent radiculopathy

Backlund, Aaron J. MBBS, FRACS, MSc, PhD, Peter, Rakesh D. MD, Storer, James MS, MD, PhD, Albin E. MD Differentiating Hip Pathology From Lumbar Spine Pathology: Key Points of Evaluation and Management. Journal of the American Academy of Orthopaedic Surgeons, February 2017, Volume 25, Issue 2, e124-e131.

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46

Literature

RESEARCH ARTICLE

A Narrative Review of Evidence-Based Recommendations for the Physical Examination of the Lumbar Spine, Sacroiliac and Hip Joint Complex

C. K. Waring* & E. K. Johnson

Columbia University, New York, NY, USA

Abstract

Non-specific low back pain is a frequent complaint in primary care, but the differential diagnosis for low back pain can be complex. Despite advances in diagnostic imaging, a specific pathoanatomical source of low back pain can remain elusive in up to 85% of individuals. Best practice guidelines recommend that clinicians conduct a focused physical examination to help to identify patients with non-specific low back pain and an evidence-based course of clinical management. The use of sensitive and specific clinical methods to assess the lumbar spine, sacroiliac and hip joints is critical for effective physical examination. Psychosocial factors also play an important role in the evaluation of individuals with low back pain, but are not included in this narrative review of physical examination methods. Physical examination of the lumbar spine, sacroiliac and hip joints is presented, organized around patient position for efficient and effective clinical assessment. Copyright © 2012 John Wiley & Sons, Ltd.

Keywords: Physical examination; differential diagnosis; low back pain; sacroiliac joint; periformis muscle syndrome

Backlund, Aaron J. MBBS, FRACS, MSc, PhD, Peter, Rakesh D. MD, Storer, James MS, MD, PhD, Albin E. MD Differentiating Hip Pathology From Lumbar Spine Pathology: Key Points of Evaluation and Management. Journal of the American Academy of Orthopaedic Surgeons, February 2017, Volume 25, Issue 2, e124-e131.

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47

Clinical Pearls

What tools can clinicians use to determine lumbar vs. hip pain?

- Clinical pathways – history/exam/radiology, initial treatment
- Diagnostic tests and injections
- Rule in vs. rule out
 - Differential
- Reliability/specificity/sensitivity

When to refer?

When to call?

noah.porter@orthonebraska.com

402-609-3000

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48



49
