FORE Baseball Sports Medicine
Game-Changing Concepts
November 4, 2016

Hip FAI & Core Muscle Deficiency: Diagnosis and Treatment

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Disclosures

- Consultant, Smith and Nephew

NewYork-Presbyterian | Columbia University Department of Orthopedic Surgery

Don't Jump out the Train…..

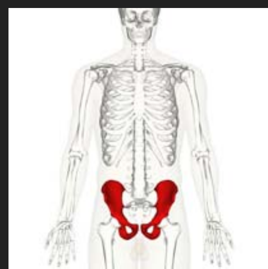
Stay on the Train…. Enjoy the Ride!

PEARLS PEARLS

Differential Diagnosis

Introduction

- **Hip**
  - Assumes an essential role in most sports related activities
  - Responsible for distributing weight between the appendicular and axial skeleton
  - Forces ~6-8x body weight during running / jumping



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Introduction

- Hip and groin pain in the athlete is serious
  - Loss of playing time
  - Require extensive rehabilitation
  - Can lead to early retirement
- Diagnosis and management can be problematic
  - Patients with chronic symptoms
  - Symptoms are generalized and ambiguous

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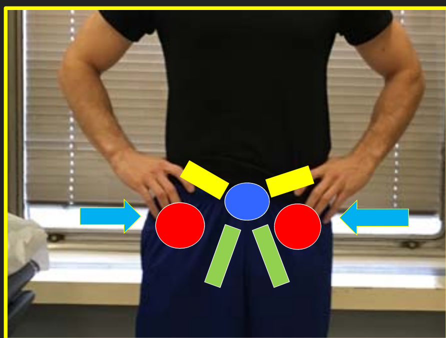
It's Complicated….

But Let's Simplify!



Introduction

AJO The American Journal of Orthopedics

The Epidemiology of Hip and Groin Injuries in Professional Baseball Players

Struan H. Coleman, MD, PhD, Stephanie W. Mayer, MD, Jared J. Tyson, MD, Keshia M. Pollack, PhD, MPH, and Frank C. Curriero, PhD

- Epidemiologic (2016)
  - 2011-2014 seasons
- 1823 injuries (5% total injuries)

Intra-articular (N = 8[illegible], 4.6%) Diagnosis Code	n (%)	Extra-articular (N = 17[illegible]9, 95.4%) Diagnosis Code	n (%)
Hip femoral acetabular	40 (47.6%)	Adductor groin strain	710 (40.8%)
Hip labral tear	28 (33.3%)	Iliopsoas strain	369 (21.2%)
Hip capsulitis	8 (9.5%)	Other hip injury	239 (13.7%)
Hip degenerative/osteoarthritis	6 (7.1%)	Medial rotator strain	109 (6.3%)
Hip chondromalacia	1 (1.2%)	Hip contusion	85 (4.9%)
Hip loose body	1 (1.2%)	Adductor spasm	45 (2.6%)
		Gluteus medius strain	37 (2.1%)
		Gluteus maximus strain	33 (1.9%)
		Sports hernia	32 (1.8%)
		Lateral rotator strain	23 (1.3%)
		Greater trochanteric bursitis	17 (1.0%)
		Piriformis syndrome	11 (0.6%)
		Adductor contusion	9 (0.5%)
		Adductor groin tear/Rupture	6 (0.3%)
		Hip abrasion	6 (0.3%)
		Hip pointer (Iliac crest contusion)	2 (0.1%)
		Iliopsoas bursitis	2 (0.1%)
		Ais apophysitis/Avulsion	1 (0.1%)
		Gluteus medius tear	1 (0.1%)
		Hip arterial disorder	1 (0.1%)
		Obturator nerve entrapment	1 (0.1%)

Abbreviations: MiLB, Minor League Baseball; MLB, Major League Baseball; SMDCS, Sports Medicine Diagnostic Coding System.

The Epidemiology of Hip and Groin Injuries in Professional Baseball Players

Struan H. Coleman, MD, PhD, Stephanie W. Mayer, MD, Jared J. Tyson, MD, Keshia M. Pollack, PhD, MPH, and Frank C. Curriero, PhD

- Noncontact mechanism during defensive fielding (74%)
  - Infielders most commonly injured (34%)

	All Players (N = 1823)		Minor League (N = 1514)		Major League (N = 309)	
	n (%)	Mean Days Missed (Median)	n (%)	Mean Days Missed (Median)	n (%)	Mean Days Missed (Median)
Intra-articular	84		67		17	
Surgery	34 (40.5)	122.5 (145.5)	27 (40.3)	139.7 (150.0)	7 (41.2)	NP*
No Surgery	50 (59.5)	22.2 (9.0)	40 (59.7)	24.9 (11.5)	10 (58.8)	13.8 (1.0)
Extra-articular	1,739		1447		292	
Surgery	66 (3.8)	54.6 (6.4)	49 (3.4)	66.6 (69.0)	17 (5.8)	20.1 (8.0)
No Surgery	1673 (96.2)	12.4 (6.0)	1398 (96.6)	12.0 (7.0)	275 (94.2)	14.6 (5.0)

*Average time lost not presented (NP) due to small sample size.

The Hips Don't Lie

- Lower extremity serves as the base
- Forces generated from hip musculature
- Spinopelvic rhythm
- Appropriate hip ROM necessary

Overview

- Athletic Hi
  Conditio
  - Adduc
  - Athlet
  - Femor
    Impinge
- Role of Femoroaceta
  Impingement

Athletic Pubalgia

Adductor Strains

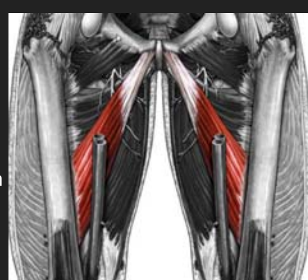
Osteitis Pubis

Adductor strains

- 2-5% of all sports injuries
- Sports requiring quick side-to-side starts, kicking and changes in direction
- Hockey, soccer, high jumping, hurdling, cross-country skiing, handball

Adductor strains

- Mechanism of injury
  - HyperAbduction and ER
  - Eccentric loading
- **Adductor longus** most frequently injured
  - Origin smaller tendon area -predisposes area to strain
- Gracilis susceptible
  - Crosses 2 joints

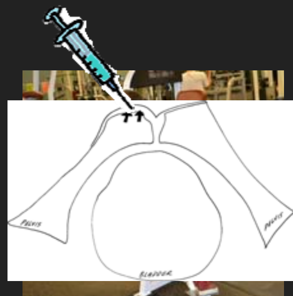


Clinical Presentation

- Sudden onset of acute aching groin pain or medial thigh pain
- **TRIAD**
  - **TTP in the muscle and insertion**
  - **pain with passive stretching**
  - **pain with resisted adduction**
- Dx: clinical exam
  - MRI: used to confirm dx,
    - ❖ differentiate b/t adductor strain/detachment, osteitis pubis

Treatment

- **Nonoperative**
  - Protection and RICE
  - Stretching in acute condition - aggravation
  - Passive ROM without pain
  - Rehabilitation
  - Cortisone injection



Treatment

- **Return to Sport**
  - ❖Full Strength + FROM + No pain = RTP
- High incidence of recurrent strains likely due to incomplete or inadequate rehab
- Evidence that athletes more predisposed to groin strain during the season
  - ❖adductor weakness
  - ❖abductor-adductor imbalance
  - ❖↓ preseason hip ROM

Success of Nonoperative Management of Adductor Longus Tendon Ruptures in National Football League Athletes

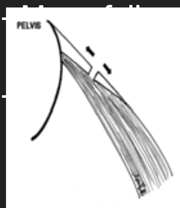
Theodore F. Schlegel, MD, Brandon D. Bushnell, MD, Jenna Godfrey, MSPH, and Martin Boublik, MD

- Level IV (2009)
- 19 NFL athletes:
  - 14 non-op v 5 op
  - RTP: Non-op (6 weeks) Op (12 weeks)
- 63% with previous symptoms

Effectiveness of a Selective Partial Adductor Release for Chronic Adductor-Related Groin Pain in Professional Athletes

Ernest Schilders, MD, FRCS, FFSEM, Alexandra Dimitrakopoulou, MD, Michael Cooke, MD, MBChB, Quamar Bismil, MBChB(Hons), MRCS, DipSEM, MFSEM, FRCS(Tr and Orth), and Carlton Cooke, PGCE, PhD, FBASES

- Level IV (2013)
  - -up
  - at vel 9 weeks



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Osteitis Pubis

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Osteitis Pubis

- Lower ab/groin pain
  - Hypermobility of pubis
  - Degeneration of cartilage
  - Stress reaction in peri-symphyseal bone
- Mechanism: repetitive kicking, twisting or hip abduction/adduction
- Unclear etiology, most likely related to overuse of the adductors and gracillis

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Osteitis Pubis - History/Exam

History
- Pain located over the symphysis
- May radiate into the lower abdominal muscles, perineum, thigh adductors
- Can be described as "adductor spasm"

Physical Exam
- TTP over symphysis and pubic rami
- Pain with adductor stretching/resisted adduction and rising from seated position

Diagnosis - Imaging

- Radiographs
  - Resorption medial ends pubis/cystic changes
  - Widening symphysis
  - Sclerosis along rami
- Bone scan
  - ↑ uptake in symphysis
  - May take months to be + in some athletes
- MRI
  - Bone edema spanning symphysis/adductor microtears

Treatment

- Nonoperative
  - Rest
  - NSAIDs
  - Physical Therapy
    - core strengthening, stability, muscle balance, hip ROM
  - Injections

Injections

- Platelet-Rich Plasma (PRP)
  - Autologous blood
  - Platelets activated to release growth factors to promote healing

Injections

- Platelet-Rich Plasma (PRP)
- Prolotherapy
  - Dextrose, sodium, lidocaine
    - ❖Stimulate inflammatory response
    - ❖Neurolysis
    - ❖Regenerative

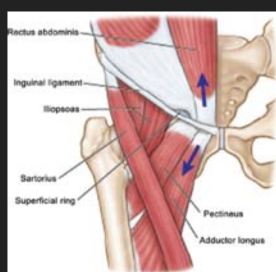
Treatment

- Nonoperative
  - Rest
  - NSAIDs
  - Physical Therapy
    - ❖core strengthening, stability, muscle balance, hip ROM
  - Injections
- Operative
  - Debridement/curettage
  - Arthrodesis
  - Adductor tenotomy

Athletic Pubalgia

Athletic Pubalgia

- Sports Hernia / Core Muscle Injury
- Hyperextension and Hyperabduction
- Muscle imbalance
  - Strong adductors
  - Weak lower abdomen
  - Shear forces across the hemipelvis



History/Exam

5 signs

1. Deep groin or lower abdominal pain
2. Pain with activity, resolves with rest
3. Tender over pubic tubercle/conjoined tendon
4. Pain with Resisted Sit-up
5. Pain with Resisted Adduction

Treatment

- **Non-operative**
  - Rest, ice, NSAIDs
  - PT (core strengthening and improved hip/pelvic muscle imbalance)
    - Goal: to correct imbalance of the hip and pelvic muscle stabilizers
  - Gradual return to athletic activities if the pain improves

Treatment

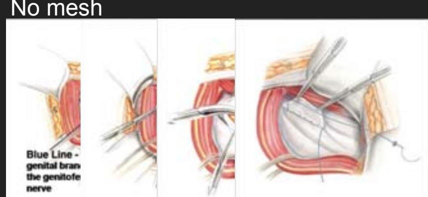
- **Operative** – failure of nonop. Rx after minimum 6-8 weeks

Surgical Management
- Minimal Repair
- Lap Repair w Mesh
- Broad Pelvic Repair

+/- Partial release of Adductor Longus

Minimal Repair

- Based on Posterior wall weakness with Valsalva (dynamic ultrasound)
- Nerve addressed
- Tension free repair of wall deficiency
- No mesh



Athletic Pubalgia

Laparoscopic Repair
- Better exposure
- Reinforce entire groin
- Tension free

Broad Pelvic Repair
- Misomer
- Main issue: external oblique aponeurosis defect with thin RA insertion
- Re-attach anterior inferolateral edge of rectus
- Adductor releases

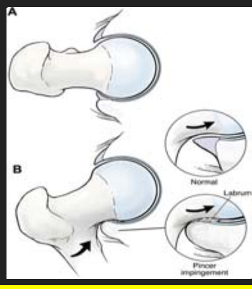
Treatment

Operative – failure of non-op tx after minimum 6-8 weeks

- Return to sports: 80-100%
  - Open: 6-12 weeks
  - Lap: 2-6 weeks

Femoroacetabular Impingement

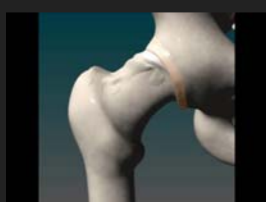
Pathophysiology



FAI→Labral tears→Arthritis

- Abnormal Contact between Acetabulum and Femoral Head Neck Junction
- Recurrent injury – Acetabular Labrum tear and Adjacent Cartilage
- 2 Lesion Types
  - Cam type
    - ❖ Abnormal femoral head-neck junction
    - ❖ Increased radius
    - ❖ Impacts into acetabulum
    - ❖ Young active male
  - Pincer type
    - ❖ Acetabular over-coverage of femoral head
    - ❖ Abnormal contact of head-neck junction on acetabular rim
    - ❖ Middle aged women

Cam Lesion



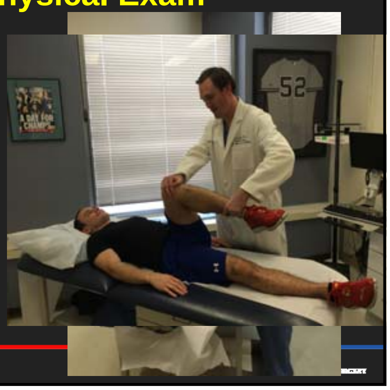
Pincer Lesion

History

- Pts c/o sharp, anterior groin pain with flexion, IR, or abduction
- Pain w/ prolonged sitting with referred knee pain
- Difficulty squatting or with lateral cutting movements

Physical Exam

- Limited ROM,
  - flexion and IR
- Impingement test:
  - Groin pain at flexion 90°, max IR
- FABER test



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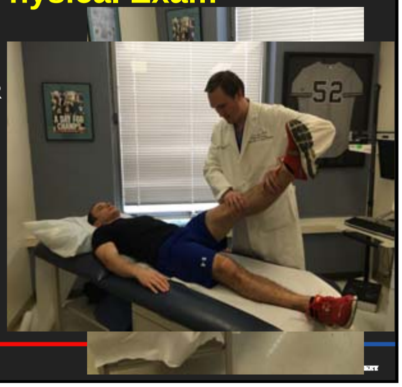
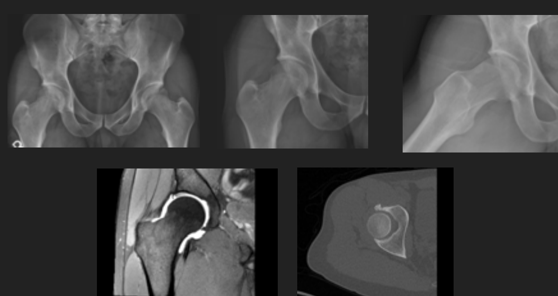


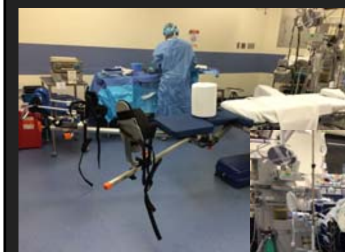
Imaging

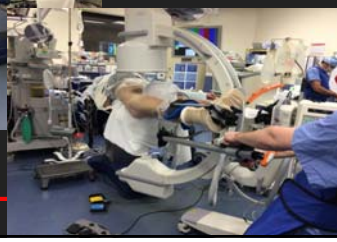


Treatment

- Nonoperative treatment
  - Activity modification
  - NSAIDS
  - Usually unsatisfactory for athlete
- Operative treatment
  - Improve clearance for hip motion
  - Address labral tears
  - Relieve femoral head abutment

Hip Arthroscopy



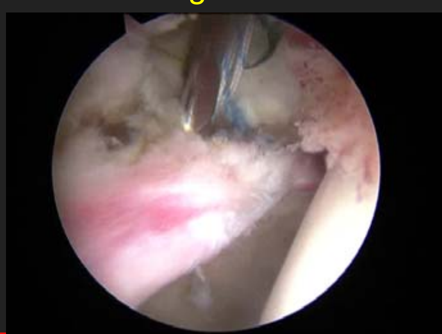


Labral Assessment

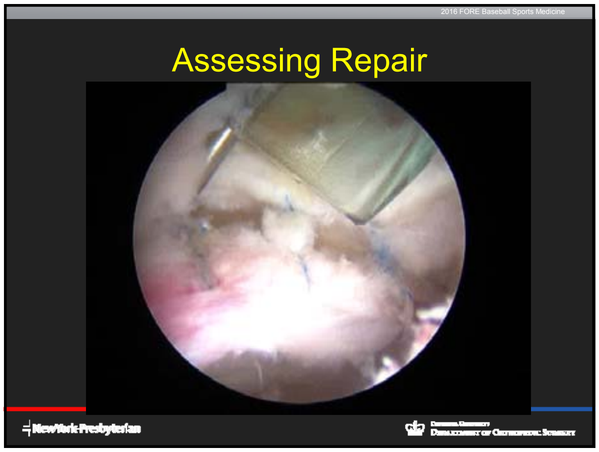
Cleaning up Cartilage Damage

Pincer Take Down

Passing Suture



Tying Knots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Assessing Repair
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Templating Cam Takedown
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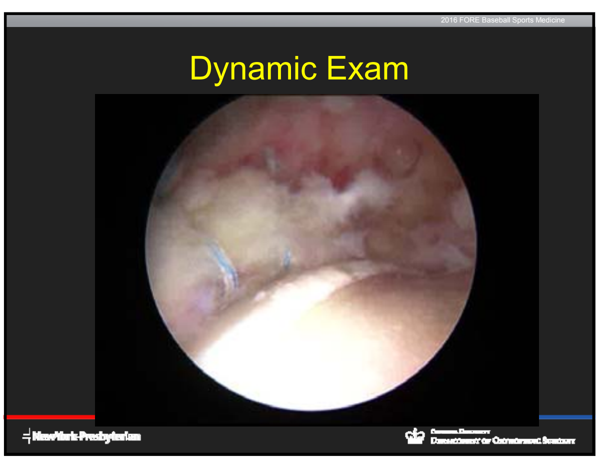
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Dynamic Exam
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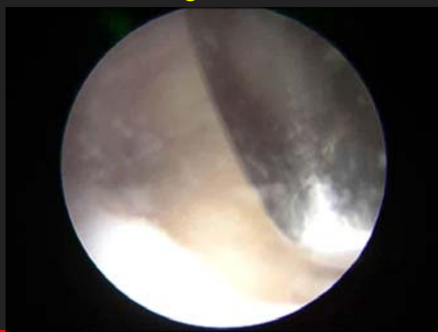
Finishing Touches



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Femoroacetabular Impingement and Athletic Hip Injuries

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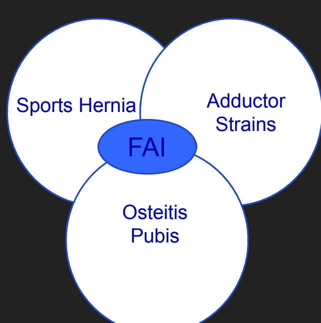

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Complements of Dr. Patrick Birmingham

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Treatment of Athletes With Symptomatic Intra-Articular Hip Pathology and Athletic Pubalgia/Sports Hernia: A Case Series

Christopher M. Larson, M.D., Bradley R. Pierce, M.D., and M. Russell Giveans, Ph.D.

- Level IV (2011)
- 37 athletes with IA and EA hip pain
  - Isolated AP sx: 25% RTP
  - Isolated FAI sx: 50% RTP
  - AP + FAI sx: 89% RTP

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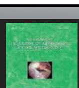
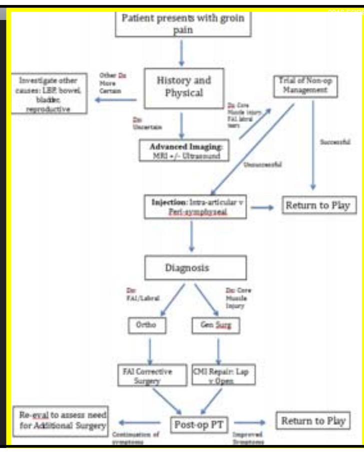


High Incidence of Athletic Pubalgia Symptoms in Professional Athletes With Symptomatic Femoroacetabular Impingement

Sommer Hammoud, M.D., Asheesh Bedi, M.D., Erin Magennis, B.A., William C. Meyers, M.D., and Bryan T. Kelly, M.D.

- Level IV (2012)
- 38 professional athletes
  - Athletes with isolated AP sx not able to RTP until FAI addressed
  - 60% athletes resolution of AP symptoms with FAI surgery

Treatment Algorithm



Final Thoughts

- Lots of overlap of Hip/Pelvic Pathology
  - Multiple procedures necessary
- History and Physical Exam paramount
- Emphasize muscle balance

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Case

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Case

- Patient is a Major League OF with right hip during game.
  - Injury occurred while accelerated around third
- Pain to palpation—lateral to ASIS
- Pain with resisted hip abduction

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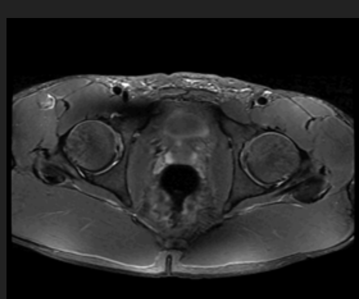
Case



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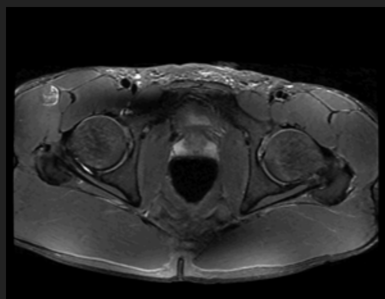
Case



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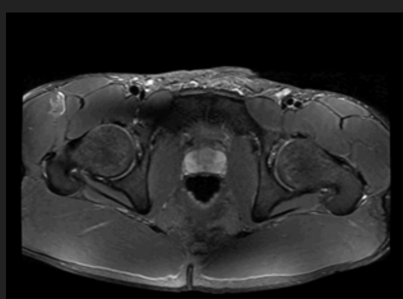
Case



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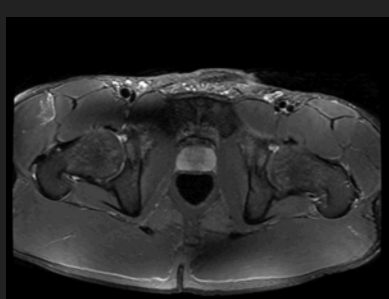
Case



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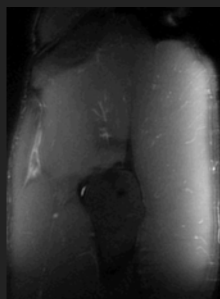
Case



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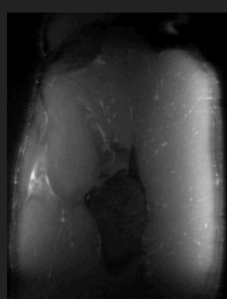
Case



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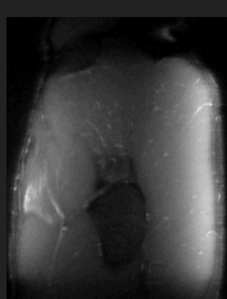
Case



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Thank You

AMAZING THINGS ARE HAPPENING HERE

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Department of Orthopedic Surgery
College of Physicians & Surgeons