



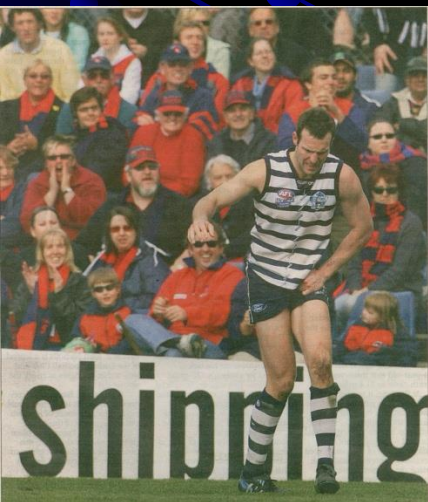
HIP & GROIN PAIN

A Diagnostic Challenge

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Epworth Sports & Exercise Medicine Group



DISCLOSURES

- 35 + yrs in specialised private practice –MSK, Sp Med, Ortho
- I have HIP with CAM+, Labral Tear+, “early chodropathology”
- I have NO hip symptoms!



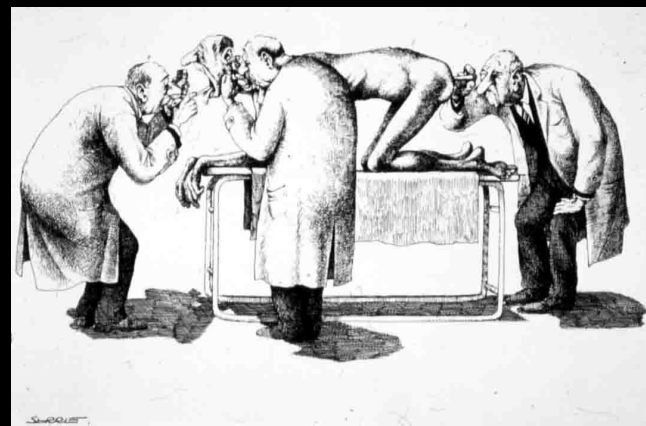
PROGRESSION OF MSK KNOWLEDGE

- Diagnosis, Imaging, Arthroscopy, Rehab

- 70's/ 80's – KNEE

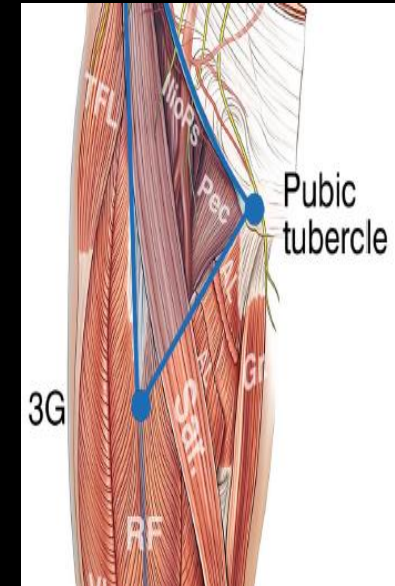
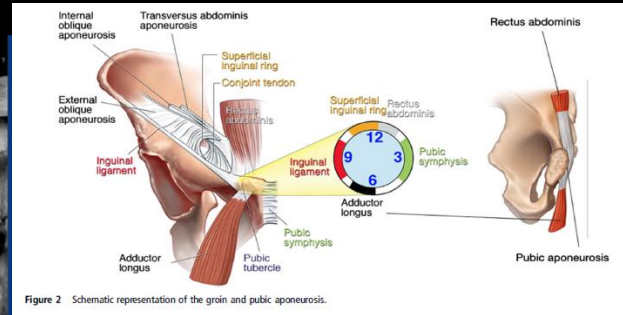
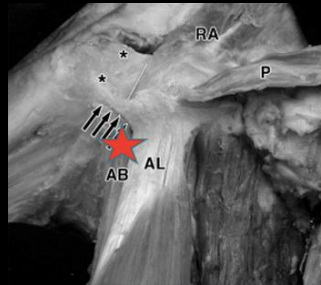
- 90's - SHOULDER
- ANKLE

- 00's - HIP *



NAVIGATING THE BERMUDA TRIANGLE IN SPORTS MEDICINE

- Complex anatomy



- Multifactorial aetiology (diagnostically difficult) - Ekberg et al 1988

- Holmich 2007
- Bradshaw et al

2008

- Variable terminology and classification
- Challenge to synthesise literature
- Traditionally difficult to manage
- Often poor localization of symptoms
- Majority of sports related conditions are from musculoskeletal origin but the potential for medical causes should be recognized (Robertson et al 2009)

Terminology and definitions on groin pain in athletes: building agreement using a short Delphi method

Adam Weir,¹ Per Hölmich,^{1,2} Anthony G Schache,³ Eamonn Delahunt,⁴ Robert-Jan de Vos⁵

23 Experts – 22 terms

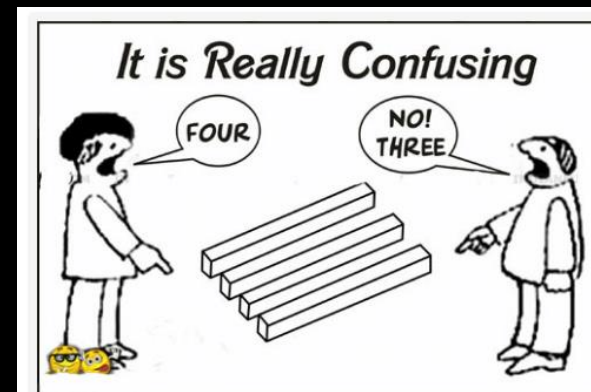
Study quality on groin injury management remains low: a systematic review on treatment of groin pain in athletes

Andreas Serner,^{1,2} Casper H van Eijck,³ Berend R Beumer,³ Per Hölmich,^{1,2} Adam Weir,¹ Robert-Jan de Vos⁴

- 72 Treatment studies
- More than 30 terms to describe diagnosis

Table 2 The various terms used to describe the diagnoses for case 2

	First diagnosis (n=23) N (%)	Second diagnosis (n=10) N (%)	Third diagnosis (n=4) N (%)
Inguinal-related groin pain	9 (39)		
Sportsman's hernia	3 (13)		
Incipient hernia	2 (9)		
Inguinal disruption	2 (9)		
Posterior wall weakness	1 (4)	1 (4)	
Gilmore's groin	1 (4)		
Inguinal canal aponeurosis strain	1 (4)		
Inguinal ligament enthesopathy	1 (4)		
Pubic bone fibrocartilage separation	1 (4)		
Hip chondral surface damage	1 (4)		
Core muscle injury	1 (4)		
Hip labral tear		2 (9)	
Adductor tendinopathy		1 (4)	
Femoroacetabular impingement		1 (4)	
Pubic symphysis pathology		1 (4)	
Conjoined tendon enthesopathy		1 (4)	
Superficial inguinal ring insufficiency		1 (4)	
Rectus abdominis strain		1 (4)	
Combination of multiple diagnoses		1 (4)	1 (4)
Public cleft arthritis			1 (4)
Transversus abdominis strain			1 (4)
Posterior wall tear			1 (4)



THE MOST COMMON HIP / GROIN PAIN CONDITIONS I SEE

- GLUTEAL TENDONOPATHY (“BURSITIS”)
- HIP OA (FAI / DEGEN LABRUM)
- ADDUCTOR STRAIN
- PUBIC STRESS SYNDROME (“OP”)
- HIP FLEXOR PAIN (PSOAS IMPINGEMENT)
- UNCOMMON
 - ILIAC CREST ENTHESOPATHY
 - HERNIA
 - NERVE ENTRAPMENT

DOHA AGREEMENT

A clinical classification based on history and examination



Doha agreement meeting on terminology and definitions in groin pain in athletes

Adam Weir, Peter Brukner, Eamonn Delahunt, Jan Ekstrand, Damian Griffin, Karim M Khan, Greg Lovell, William C Meyers, Ulrike Muschaweck, John Orchard, Hannu Paajanen, Marc Philippon, Gilles Reboul, Philip Robinson, Anthony G Schache, Ernest Schilders, Andreas Semer, Holly Silvers, Kristian Thorborg, Timothy Tyler, Geoffrey Verrall, Robert-Jan de Vos, Zarko Vuckovic and Per Hölmich

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The Warwick Agreement on femoroacetabular impingement syndrome (FAI syndrome): an international consensus statement

D R Griffin,^{1,2} E J Dickenson,^{1,2} J O'Donnell,^{3,4} R Agricola,⁵ T Awan,⁶ M Beck,⁷ J C Clohisy,⁸ H P Dijkstra,⁹ E Falvey,^{10,11} M Gimpel,¹² R S Hinman,¹³ P Hölmich,^{9,14} A Kassarian,^{15,16} H D Martin,¹⁷ R Martin,^{18,19} R C Mather,²⁰ M J Philippon,²¹ M P Reiman,²⁰ A Takla,^{3,22,23,24} K Thorborg,¹⁴ S Walker,²⁵ A Weir,^{9,26} K L Bennell²³

► Additional material is published online only. To view please visit the journal online (<http://dx.doi.org/10.1136/bjsports-2016-096743>).

For numbered affiliations see end of article.

Correspondence to

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Accepted 31 July 2016

The Warwick Agreement on femoroacetabular impingement syndrome has been endorsed by the following 25 clinical societies: American Medical Society for Sports Medicine (AMSSM), Association of Chartered Physiotherapists in Sports and Exercise Medicine (ACPSEM), Australasian College of Sports and Exercise Physicians (ACSEP), Austrian Sports Physiotherapists, British Association of Sports and Exercise Medicine (BASEM), British Association of Sport Rehabilitators and Trainers (BASRaT), Canadian Academy of Sport and Exercise Medicine (CASEM), Danish Society of Sports Physical Therapy (DSSF), European College of Sports and Exercise Physicians (ECOSEP), European Society of Sports Traumatology, Knee Surgery and Arthroscopy (ESSKA), Finnish Sports Physiotherapist Association (SUFT), German-Austrian-Swiss Society for Orthopaedic Traumatologic Sports Medicine (GOTS), International Federation of Sports Physical Therapy (IFSPT), International Society for Hip Arthroscopy (ISHA), Gruppo di Interesse Specialistico dell'A.I.F.I., Norwegian Association of Sports Medicine and Physical Activity (NIMF), Norwegian Sports Physiotherapy Association (FFI), Society of Sports Therapists (SST), South African Sports Medicine Association (SASMA), Sports Medicine Australia (SMA), Sports Doctors Australia (SDrA), Sports Physiotherapy New Zealand (SPNZ), Swedish Society of Exercise and Sports Medicine (SFAIM), Swiss Society of Sports Medicine (SGMS/SGSM), Swiss Sports Physiotherapy Association (SSPA).

GROIN PAIN

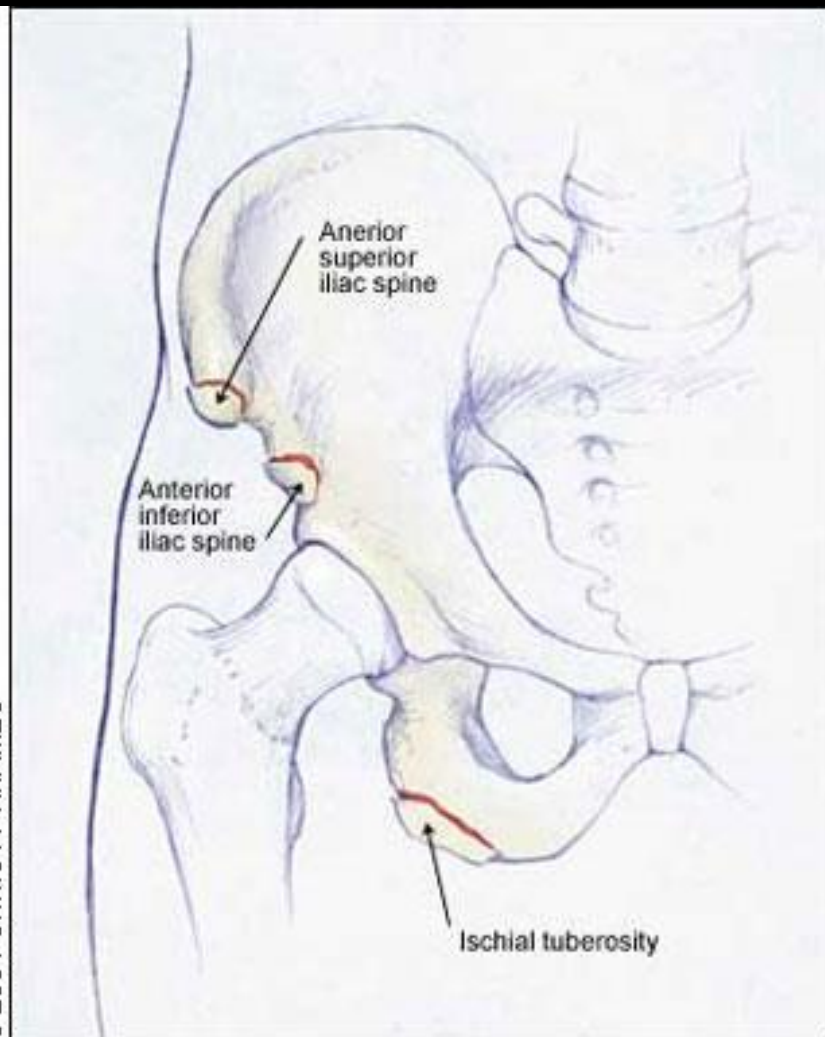
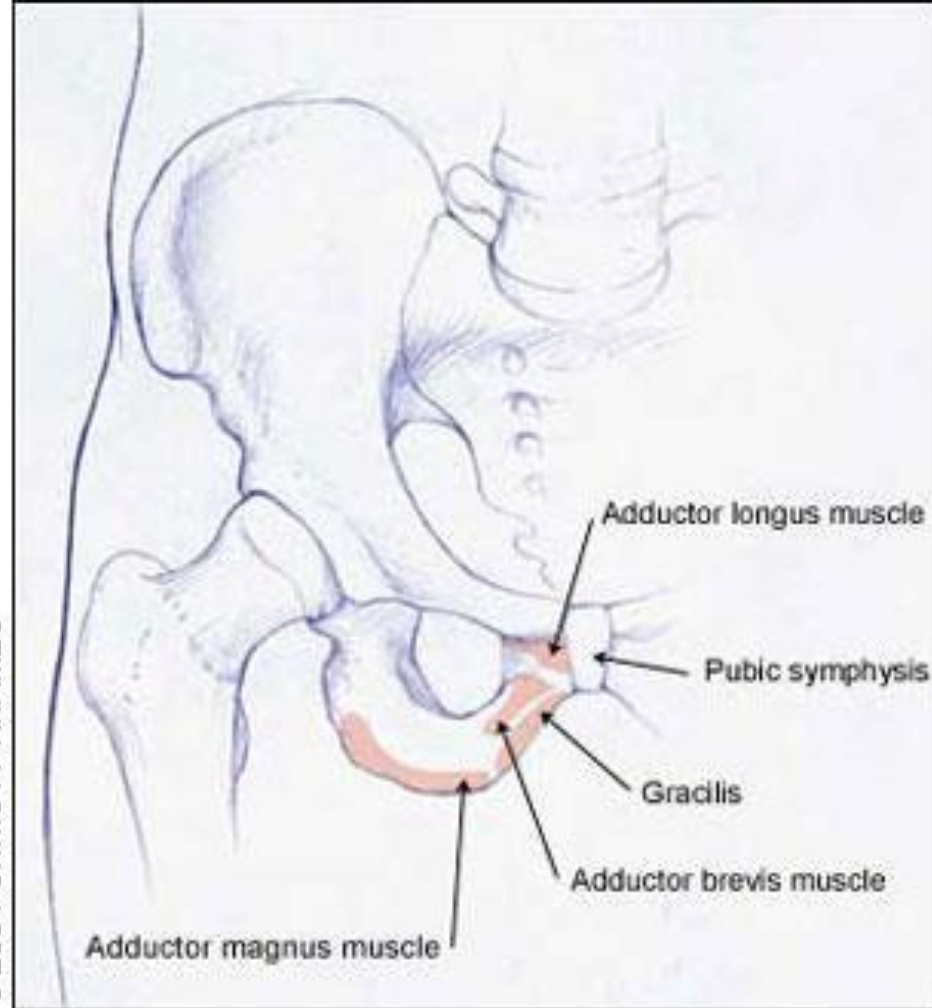
- What is the origin (site) of the pain ?
- INTRA or EXTRA ARTICULAR ?
- Acute or chronic ?
- Is it structural (mechanical) or inflammatory ?
- Grade / severity
- Rest or active Rx ?
- Cure (recover) or manage ?

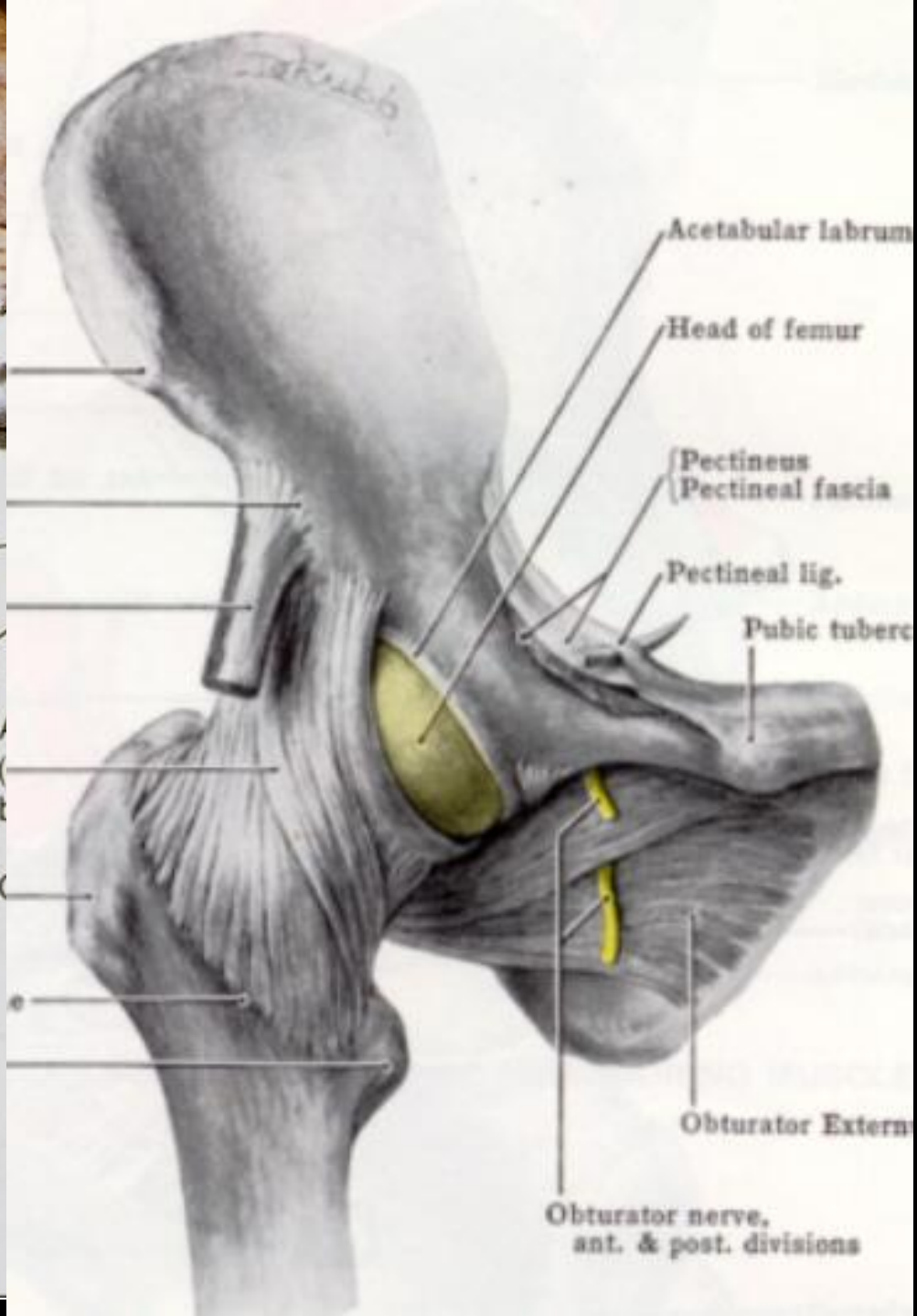
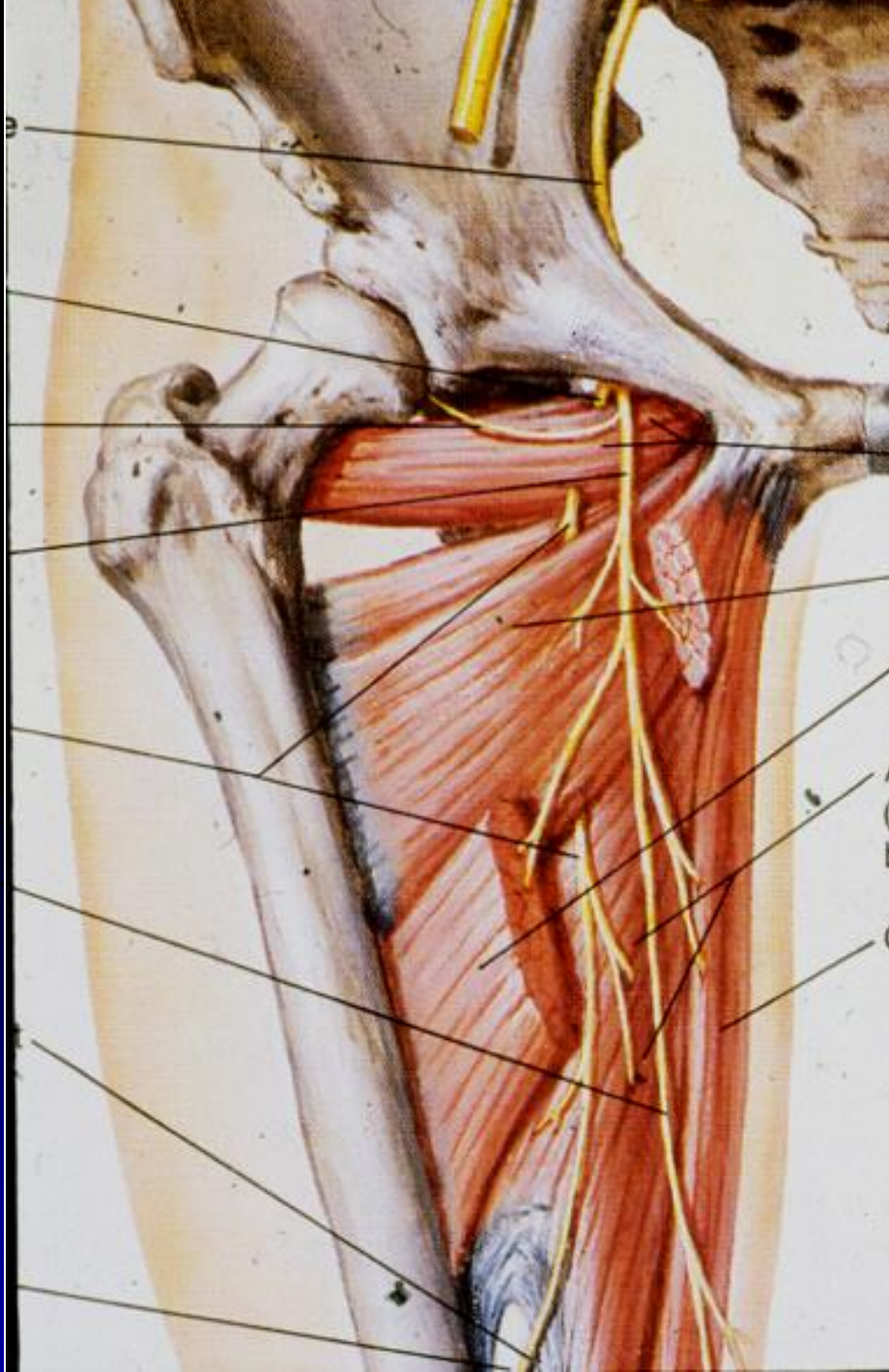
Anatomy of the Groin Area

Superficial Muscles

Deep Muscles

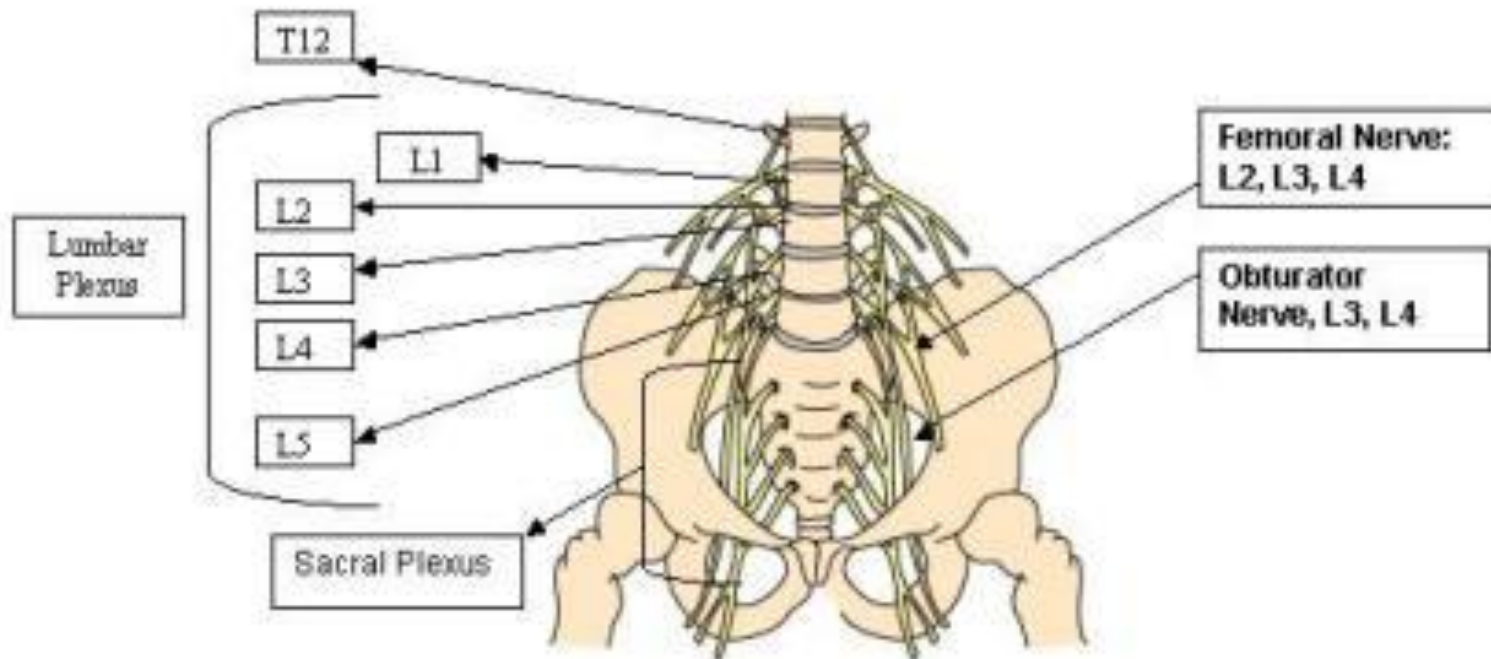






INNERVATION OF THE GROIN

- Lumbar nerve roots 3 & 4....2 & 5
- Branches of femoral, obturator & sciatic



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Defined clinical entities for groin pain in athletes

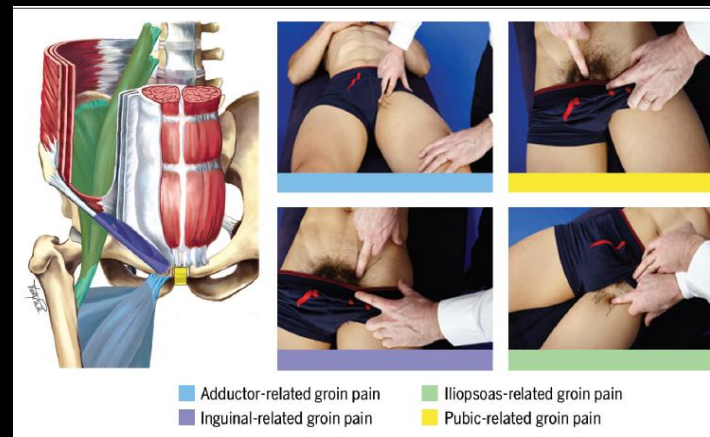
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Iliopsoas related groin pain
Inguinal related groin pain
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1. DEFINED CLINICAL ENTITIES FOR GROIN PAIN

- **Adductor:** local tenderness
Pain on resisted adduction
- **Iliopsoas:** Pain on resisted hip flexion
+/- Pain on stretching hip flexion
- **Inguinal:** Pain located inguinal canal
+/- Tenderness
No palpable hernia
More likely if aggravated by : resistance of abdominal muscles

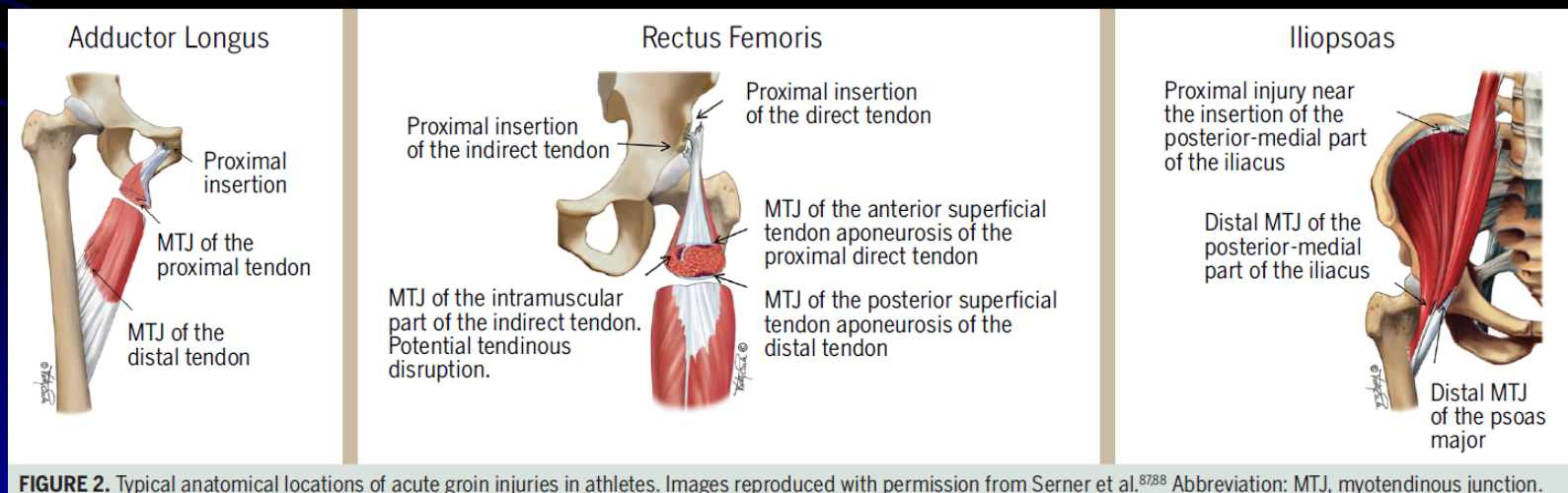
Valsalva/cough /sneeze

- **Pubic:** Tender PS + adjacent pubic bone



ACUTE ADDUCTOR LONGUS/ RECTUS FEMORIS/ ILIOPSOAS INJURIES

- Often occur at the **musculotendinous** junction (MTJ)
- Adductor longus/rectus femoris may involve tendon rupture/ avulsion primarily at the proximal insertion.
- Acute **adductor** longus usually occur during kicking/direction change
- Acute **rectus** femoris injuries primarily occur during kicking/sprinting
- Acute **iliopsoas** mainly occur with directional change movements



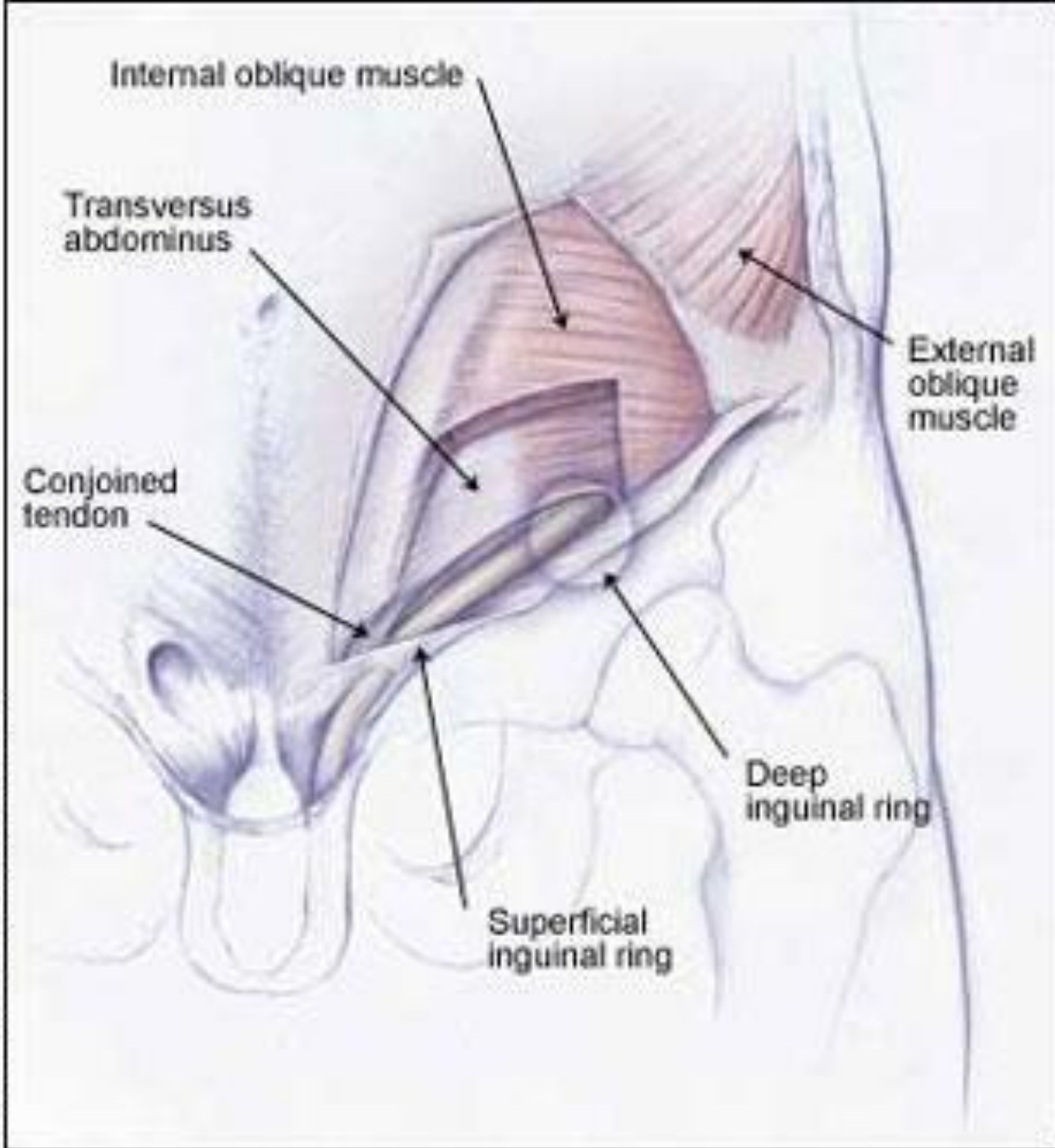
SPORTS HERNIA (OCCULT HERNIA)

- Caused by: Weakness/tear posterior inguinal canal

May include: tear of transversalis fascia/conjoined tendon

- tear rectus abdominus/ internal oblique or external oblique

- Difficult diagnosis. Not well defined
- Difficult to evaluate by examination/imaging
- Treatment controversial



SPORTS HERNIA (OCCULT HERNIA)

- **History:** Insidious onset
Unilateral
Aggravated by: Sudden movements, acceleration, turning.
Cough, sneeze
Pain in conjoined tendon +/- inguinal canal

Pain disappears at rest (inactivity)
- **Examination:** Tender conjoined tendon, pubic tubercle, mid inguinal

Tender : dilated superficial inguinal ring
posterior wall inguinal canal
Pain with: resisted sit up – bilat SLR (PAW weakness)

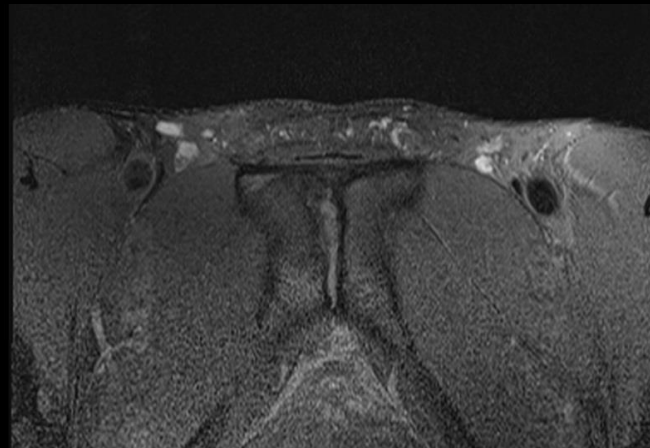
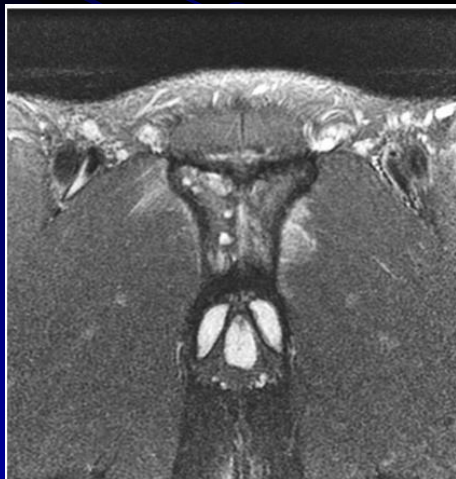
May **NOT** detect inguinal hernia

PUBIC RELATED GROIN PAIN

PUBIS STRESS SYNDROME (PSS)

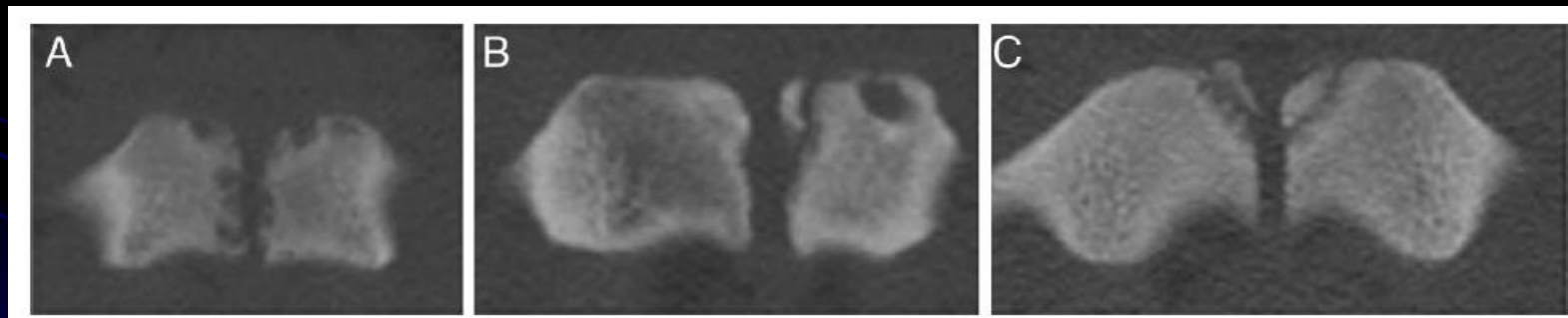
(osteitis pubis)

- Insidious onset of pain : adductor, pubic symphysis, abdominal, retroscrotal – multiple structures involved
- Aggravated by: sprint, kick, twist, cutting
- Common in: AFL, soccer
- Can be: Self limiting or chronic (months to years)
- Biomechanical overloading leads to bony stress response
- No inflammatory cells (Verrall 2008)



PUBIC SYMPHYSIS IRRITATION + PUBIC INSTABILITY

- **Bone marrow oedema** (BMO), fluid in the PS and periarticular oedema correlated with duration (less than 6/12) (Kunduracioglu et al 2007)
- **Subchondral sclerosis**, subchondral resorption and bony irregularities and osteophytes correlated with Chronicity (more than 6/12) (Kunduracioglu et al 2007) cf. **osteolysis** of the clavicle.



- Clinical diagnosis is made on Squeeze test +/- compression (Mens et al 2006), single leg stance subjective symptom, resisted bilateral hip abduction and palpation (Holmich et al 2004)

ANT CAUDAL TILT

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DOHA AGREEMENT

BJSM

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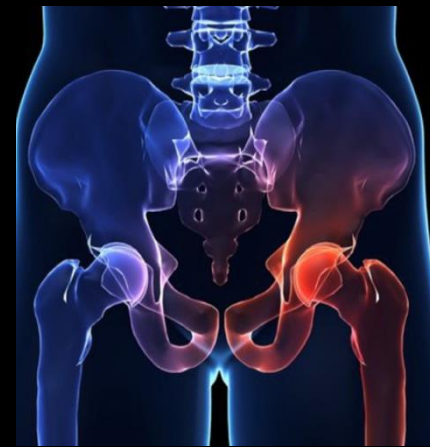
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2. HIP RELATED GROIN PAIN



- History: Onset, nature, location (groin, lateral hip, anterior thigh, buttock, knee, low back, lateral/ posterior thigh)

Mechanical symptoms: catch, lock, click, giving way

- Can be hard to distinguish from other causes and may coexist with other causes of groin pain
- Examination essential: Include: Flex, add/ IR (FADIR)
Flex, abd/ ER (FABER)
- HIP PAIN SHOULD **NOT** BE DIAGNOSED ON XRAY OR MRI

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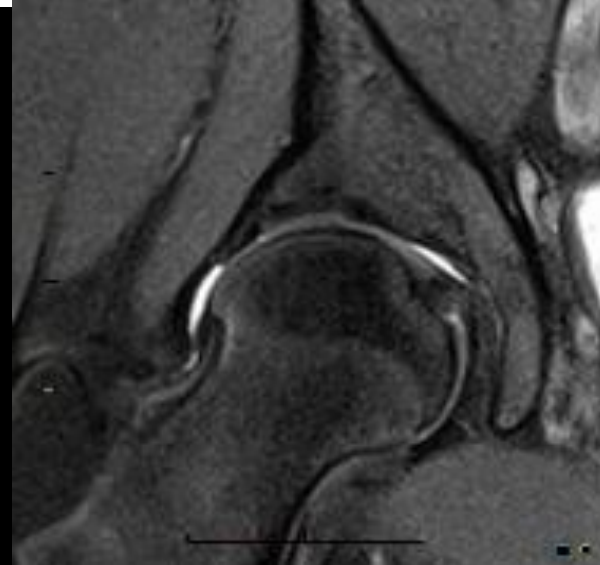
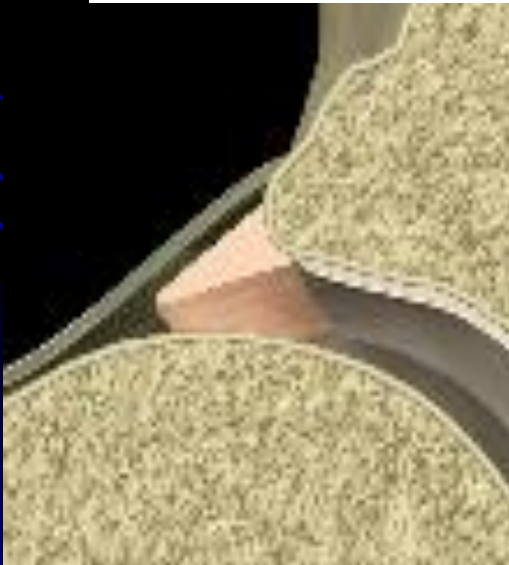
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THE WARWICK AGREEMENT ON FAI

What is FAI syndrome?

FAI syndrome is a motion-related clinical disorder of the hip with a triad of symptoms, clinical signs and imaging findings. It represents symptomatic premature contact between the proximal femur and the acetabulum.

Level of agreement: mean score 9.8 (95% CI 9.6 to 10).



THE WARWICK AGREEMENT ON FAI

How should FAI syndrome be diagnosed?

Symptoms, clinical signs and imaging findings must be present to diagnose FAI syndrome.

Level of agreement: mean score 9.8 (95% CI 9.6 to 10).

Symptoms

The primary symptom of FAI syndrome is motion-related or position-related pain in the hip or groin. Pain may also be felt in the back, buttock or thigh. In addition to pain, patients may also describe clicking, catching, locking, stiffness, restricted range of motion or giving way.

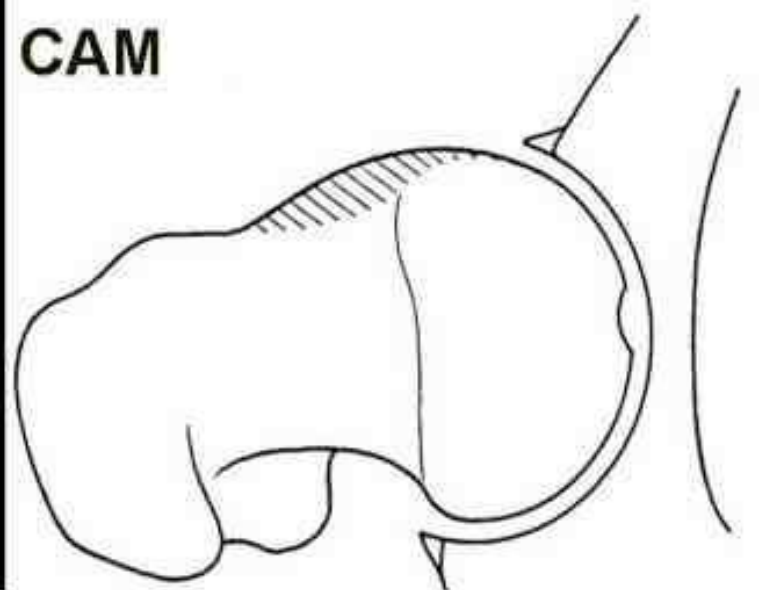
Level of agreement: mean score 9.8 (95% CI 9.6 to 10).

Clinical signs

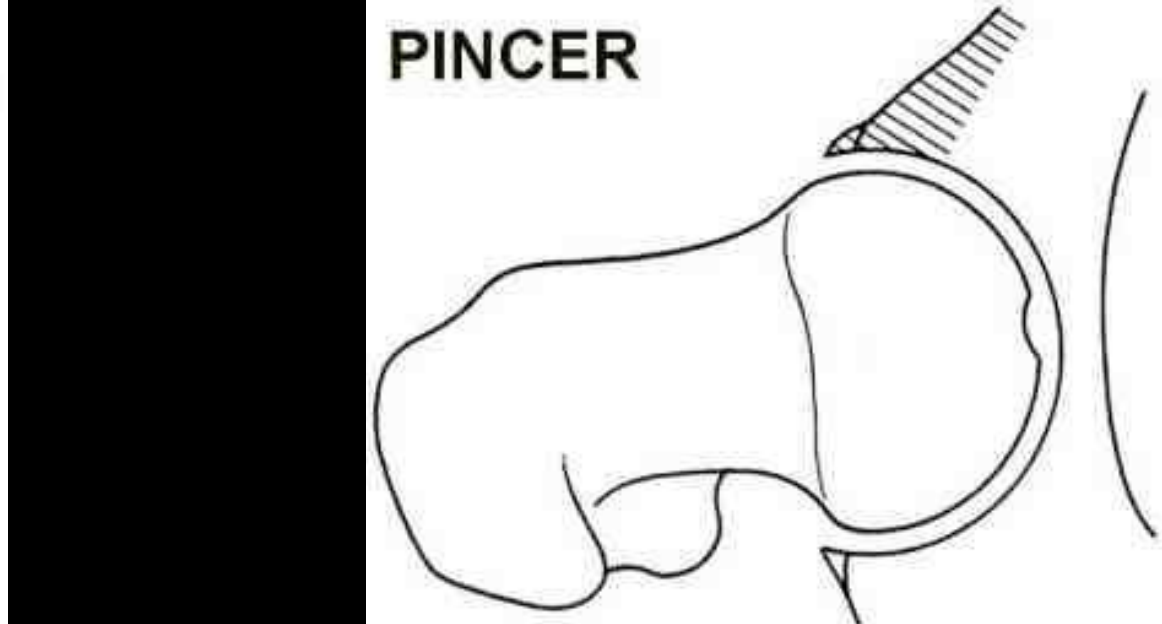
Diagnosis of FAI syndrome does not depend on a single clinical sign; many have been described and are used in clinical practice. Hip impingement tests usually reproduce the patient's typical pain; the most commonly used test, flexion adduction internal rotation (FADIR), is sensitive but not specific. There is often a limited range of hip motion, typically restricted internal rotation in flexion.

Level of agreement: mean score 9.9 (95% CI 9.7 to 10).

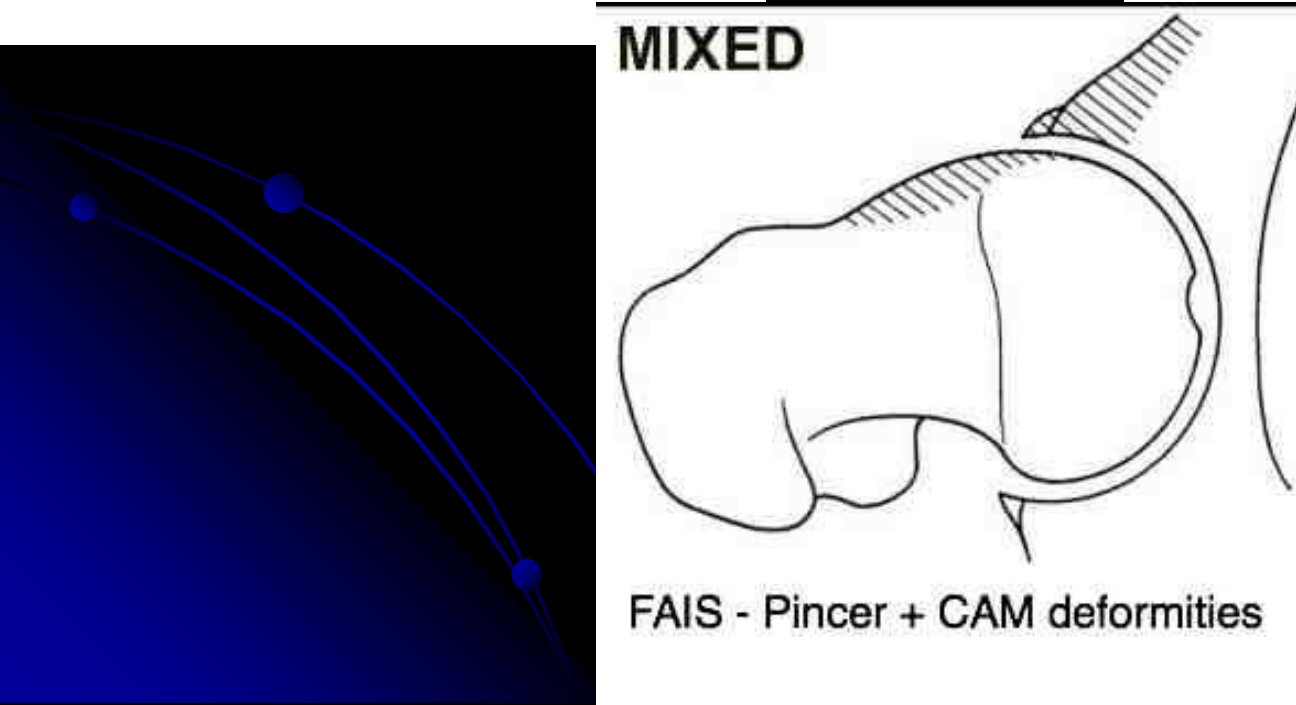




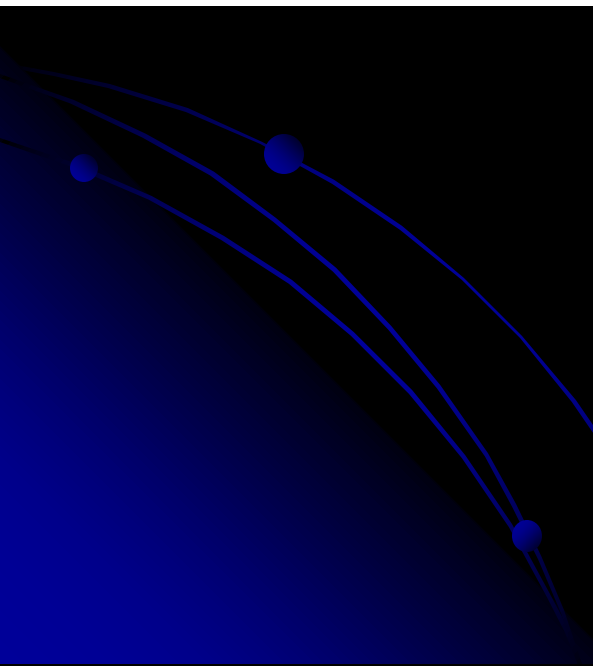
FAIS - CAM deformity



FAIS Pincer deformity



FAIS - Pincer + CAM deformities



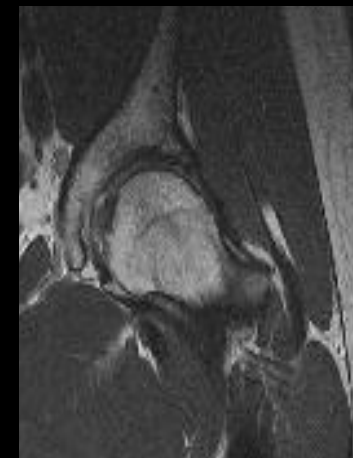


THE WARWICK AGREEMENT ON FAI

Diagnostic imaging

An anteroposterior radiograph of the pelvis and a lateral femoral neck view of the symptomatic hip should initially be performed to obtain an overview of the hips, identify cam or pincer morphologies, and identify other causes of hip pain. Where further assessment of hip morphology and associated cartilage and labral lesions is desired, cross-sectional imaging is appropriate.

Level of agreement: mean score 9.5 (95% CI 9.1 to 9.8).



THE WARWICK AGREEMENT ON FAI

What is the appropriate treatment of FAI syndrome?

FAI syndrome can be treated by conservative care, rehabilitation or surgery. Conservative care may involve education, watchful waiting, lifestyle and activity modification. Physiotherapy-led rehabilitation aims to improve hip stability, neuromuscular control, strength, range of motion and movement patterns. Surgery, either open or arthroscopic, aims to improve the hip morphology and repair damaged tissue. The good management of the variety of patients with FAI syndrome requires the availability of all of these approaches.

Level of agreement: mean score 9.5 (95% CI 9.0 to 10).



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BJSM

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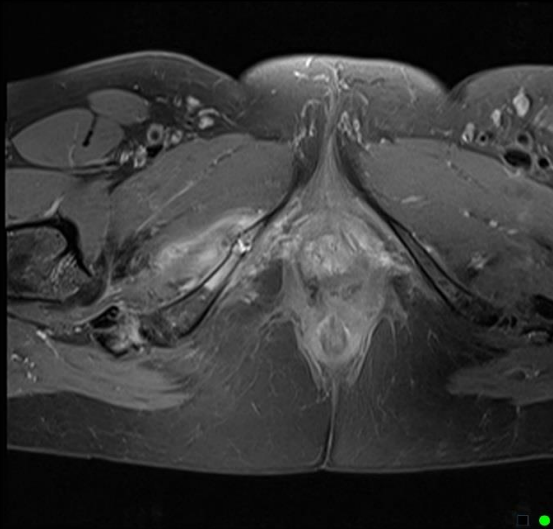
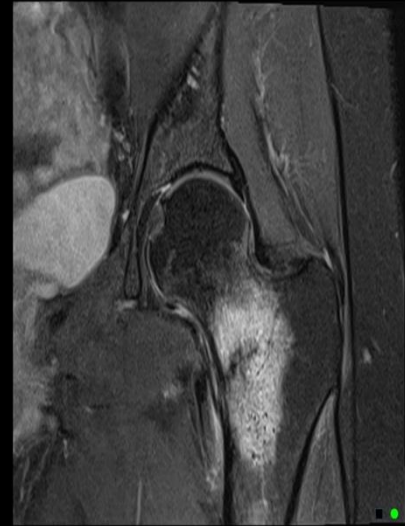
3. OTHER CONDITIONS CAUSING GROIN PAIN IN ATHLETES

Table 1 An overview of some of the possible causes of groin pain in athletes

Entities defined during the meeting	Other musculoskeletal causes	Not to be missed
Adductor-related groin pain	Inguinal or femoral hernia	Stress fracture
Iliopsoas-related groin pain	Posthernioplasty pain	▶ Neck of femur
Inguinal-related groin pain	Nerve entrapment	▶ Pubic ramus
Pubic-related groin pain	▶ Obturator	▶ Acetabulum
Hip-related groin pain	▶ Ilioinguinal	Hip joint
	▶ Genitofemoral	▶ Slipped capital femoral epiphysis (adolescents)
	▶ Iliohypogastric	▶ Perthes' disease (children and adolescents)
	Referred pain	▶ Avascular necrosis/transient osteoporosis of the head of the femur
	▶ Lumbar spine	▶ Arthritis of the hip joint (reactive or infectious)
	▶ Sacroiliac joint	Inguinal lymphadenopathy
	Apophysitis or avulsion fracture	Intra-abdominal abnormality
	▶ Anterior superior iliac spine	▶ Prostatitis
	▶ Anterior inferior iliac spine	▶ Urinary tract infections
	▶ Pubic bone	▶ Kidney stone
		▶ Appendicitis
		▶ Diverticulitis
		Gynaecological conditions
		Spondyloarthropathies
		▶ Ankylosing spondylitis
		Tumours
		▶ Testicular tumours
		▶ Bone tumours
		▶ Prostate cancer
		▶ Urinary tract cancer
		▶ Digestive tract cancer
		▶ Soft tissue tumours

OTHER CONDITIONS CAUSING GROIN PAIN IN ATHLETES

- Stress fracture femoral neck inferior cortex.
(compression fracture)
- Stress fracture femoral neck superior cortex
(tension fracture)- **At risk fracture**
- Stress fracture Pubic Ramus



A good patient history of groin pain is **ESSENTIAL**

- Past history: Perthes, SUFE, dysplasia, CDH, inflammatory arthritis, infection, fracture (femur/tibia)
- Family history: Early OA, inflammatory joint problems
- Type of sport: Football, martial arts, ballet etc
- Training loads
- Location of pain: Groin, buttock, thigh, low back, grasp sign
- Onset of pain: Acute vs gradual
- Limping
- Mechanical symptoms: Clicking, catching, clunking
- Early morning stiffness (not what you think!)





Anterior

Enthesitis
(anterior superior
iliac crest)

True hip pain
Iliopsoas bursitis

Meralgia
paresthetica

Posterior/lateral

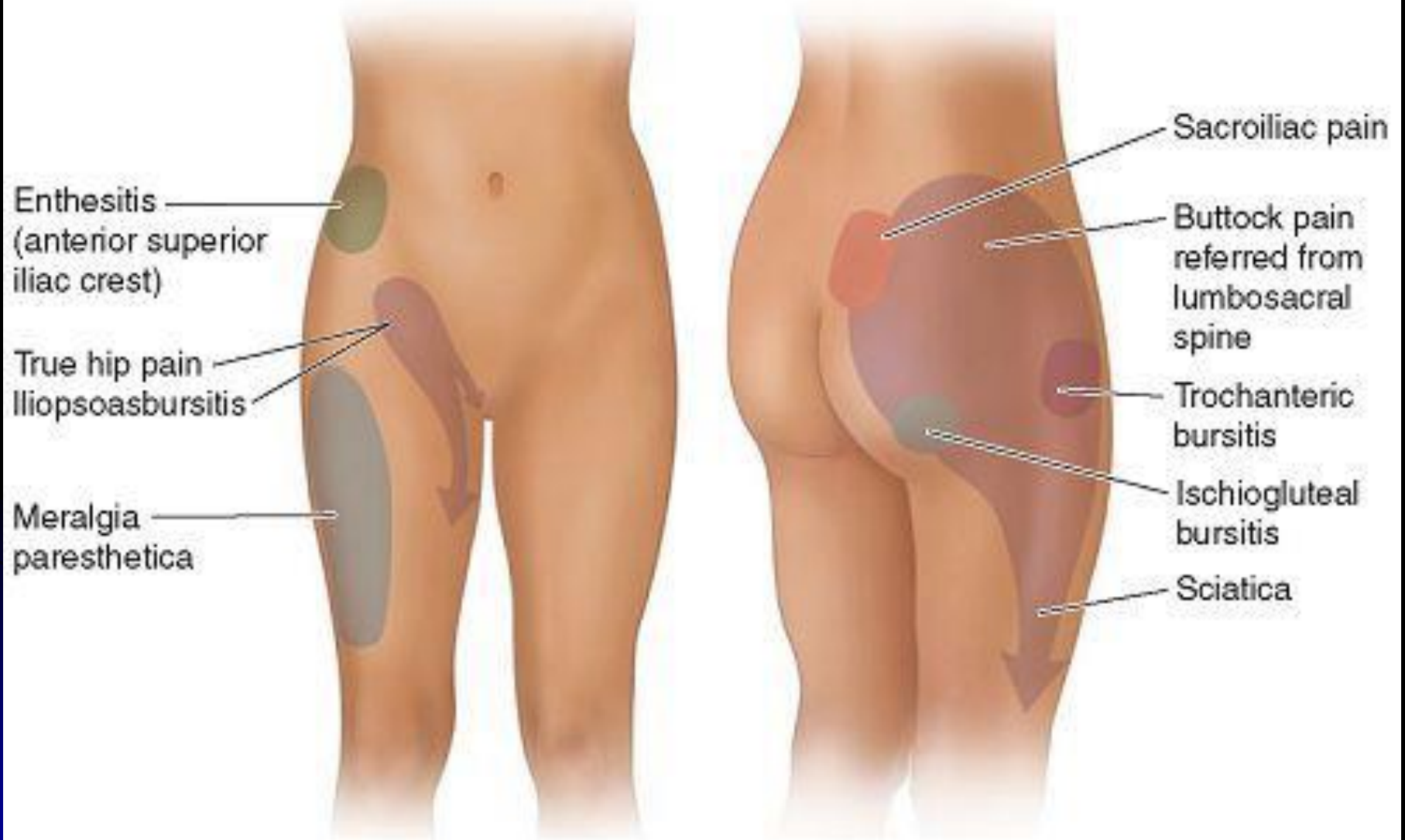
Sacroiliac pain

Buttock pain
referred from
lumbosacral
spine

Trochanteric
bursitis

Ischiogluteal
bursitis

Sciatica



A good patient history of groin pain is **ESSENTIAL**

- Symptoms with: Prolonged sitting, putting on socks
Squatting, bending forward, hip rotation
Sex life

RED FLAGS: History of cancer especially prostate, breast, ovary

Night pain

Weight loss

Systemic symptoms: Fatigue, fever, low energy levels

Prolonged corticosteroid use

Barotrauma (scuba diving)

EXAMINATION

- Deformity , swelling, leg length
- Posture & Gait
- Range of movement (ROM)
- Tender sites
- Strength
- Cough, Squeeze, sit up, BSLR
- FABER - FADIR
- Lumbar spine & S-I jt.



EXAMINATION OF THE GROIN

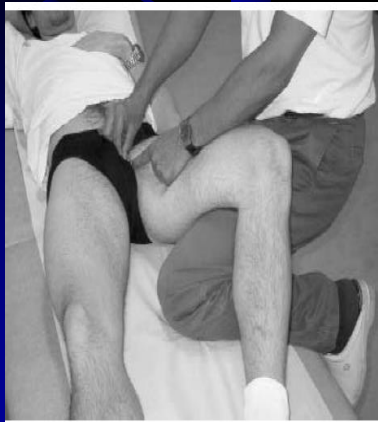
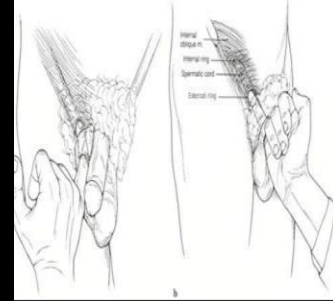
Supine

Palpation: Point of maximum tenderness

Inguinal canal including invagination (hernia)

Scrotum (if indicated)

Adductor/ Rectus/iliopsoas/pubis symphysis



Palpation of the adductor longus muscle insertion.



Palpation of the rectus abdominis muscle.



Palpation of the iliopsoas muscle.



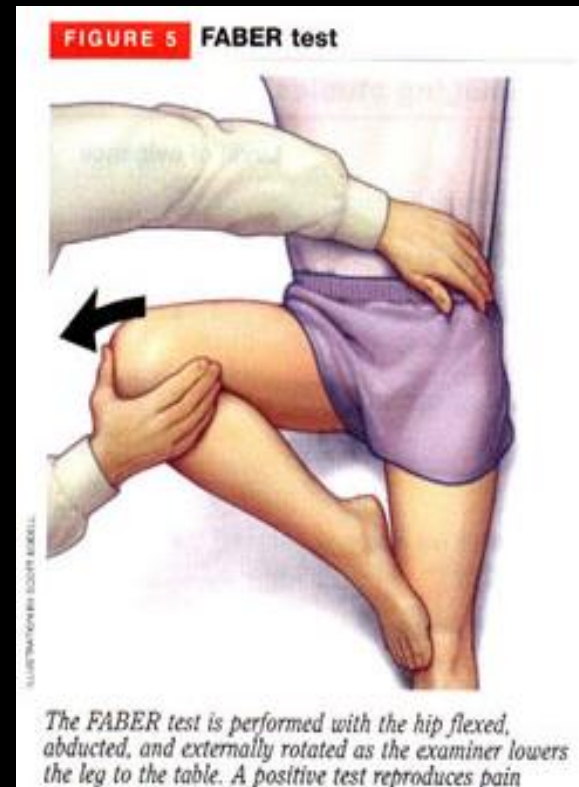
Palpation of the symphysis joint.

EXAMINATION OF THE GROIN

Hip: ROM: **FADIR** (for hip impingement/labral tear/intraarticular pathology)
: **FABER**



Figure 3 Flexion-adduction-internal rotation test.



EXAMINATION OF THE GROIN

- Squeeze test (pain provocation test It is NOT a strength test).

At 45 degrees (also 0 degrees, 90 degrees)

BP cuff starts at 20 mmhg. (< 140 is abnormal in athletes).

Use in conjunction with other functional tests.

Groin bars used at professional sporting clubs, evaluate hip abductor/adduction strength

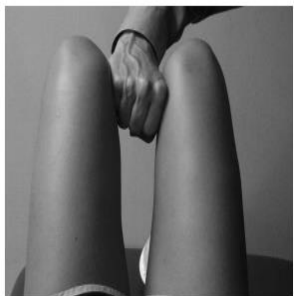
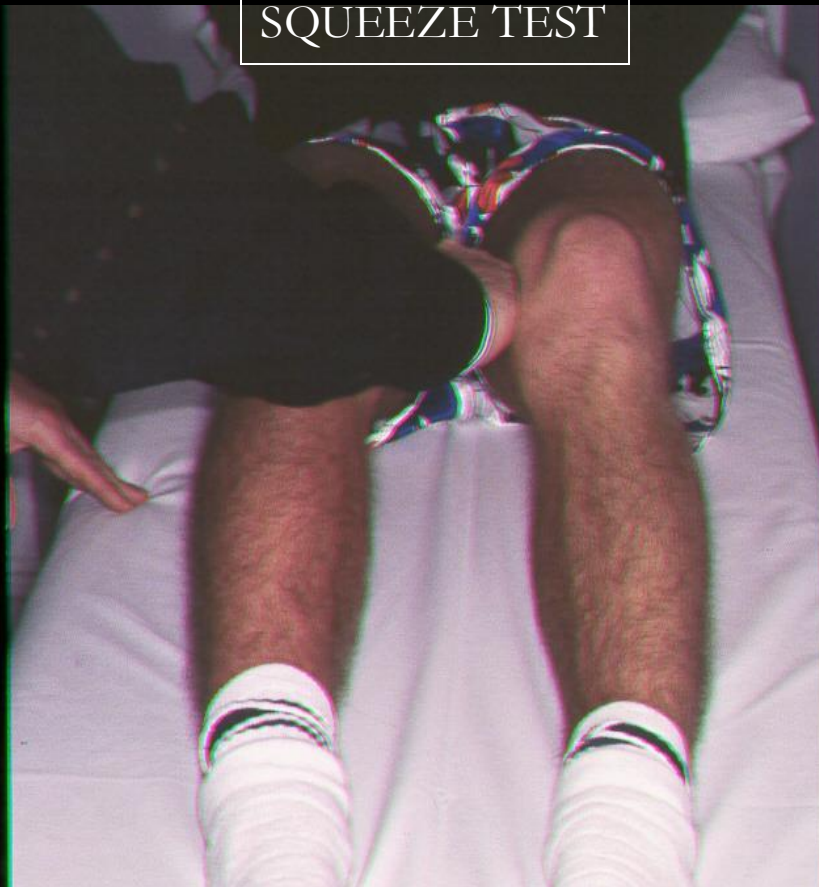
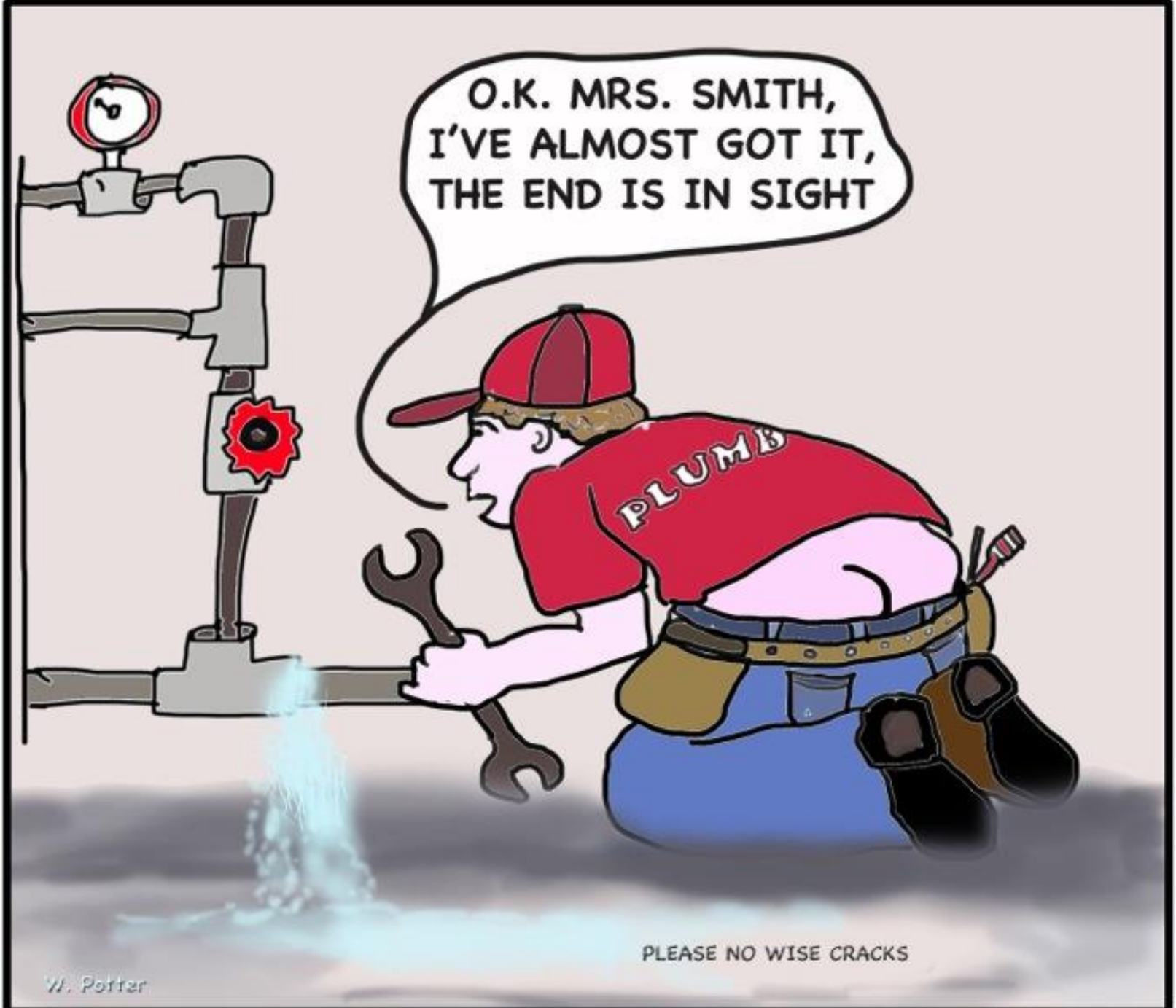


Figure 9 Squeeze test.



SQUEEZE TEST





O.K. MRS. SMITH,
I'VE ALMOST GOT IT,
THE END IS IN SIGHT

PLEASE NO WISE CRACKS

W. Potter

Art & Cartoons by Whitney Potter

TREATMENT OPTIONS



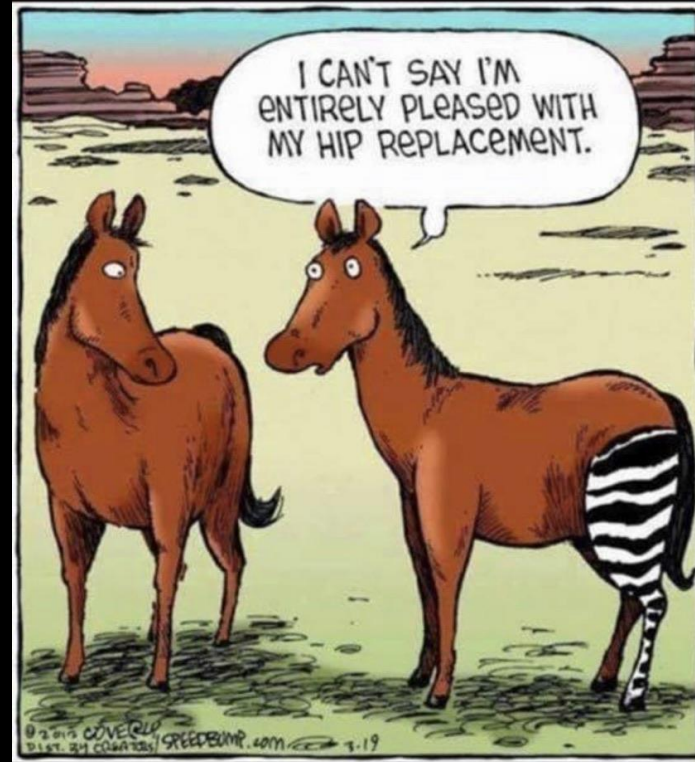
CORE MANAGEMENT PRINCIPLES

- ESTABLISH CLEAR DIAGNOSIS *
- IDENTIFY CAUSE- IF POSSIBLE
- CONFIRM PATIENT GOALS
- OUTLINE THERAPY NEEDS- STRENGTH ETC..
- SET HOME BASED PROGRAM
- MODIFY ACTIVITY LOADS
- SET REALISTIC GOALS
- REGULAR FOLLOW UP & REVIEW
- PSYCHOLOGICAL SUPPORT – NOT JUST ELITE ATHLETES
- RECOVERY TIME FRAME ESTIMATES
- PREVENTION STRATEGY – MINIMISE RECURRENCE





"Hip replacement? He was never hip to begin with."



IS SURGERY THE ONLY SOLUTION ?

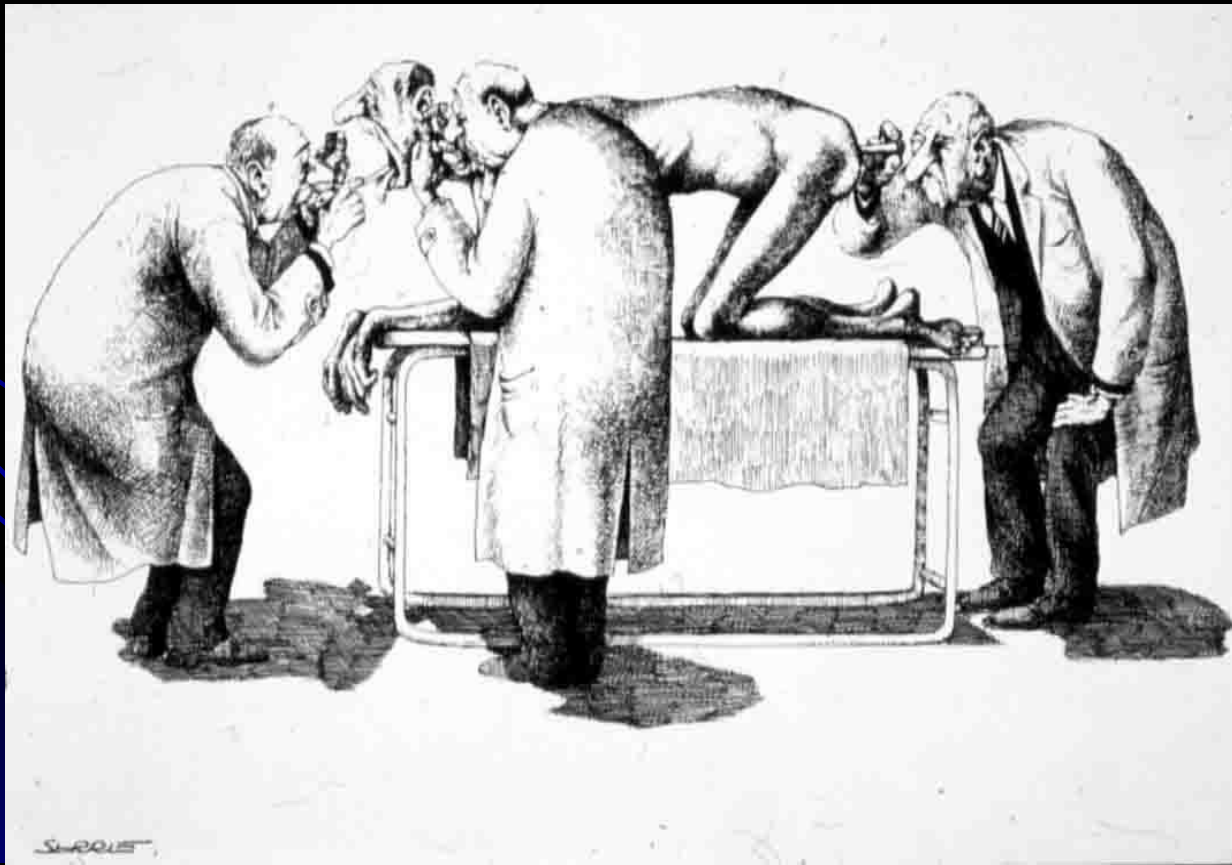
TREATMENT OPTIONS

- Pain Mx - analgesia, nsaid, REST !
- Acute injury - 6 wk collagen repair
 - - “rest” vs modified activity
- Address weakness, muscle imbalance, inflexibility
 - strength X' s - glutes, adductors, quad
 - core / pelvis base
 - pilates ,yoga
- Swim / Cycle - low impact fitness maintenance
- CS injection - hip jt, adductor origin, pubic symphysis
- Surgical options
 - arthroscopy hip
 - adductor release
 - pubic symphysis debridement
- Realistic expectations

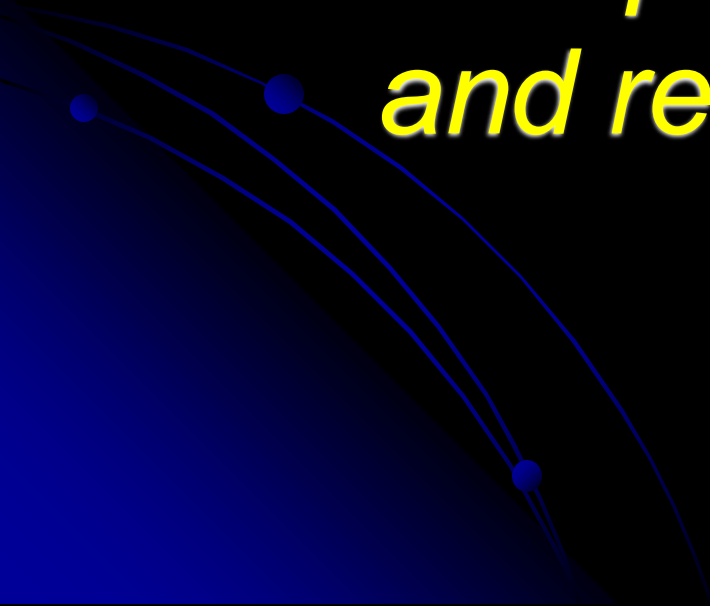
TAKE HOME SUMMARY

- 1 Groin injury common in community & sport***
- 2. Difficult often to achieve precise diagnosis***
- 3. Multi –tissue, co-existent pathologies***
- 4. No substitute for clinical acumen***
- 5. It is not only elite performers who expect elite information & advice***
- 6. Must correlate clinical and imaging findings***
- 7. Early intervention gives best results***
- 8. Recovery often slow – chronic symptom risk***

***“More is missed
by not looking
than by not knowing”***



*“Better to keep your mouth shut
and let people think you are an
idiot,
than to open it, start speaking,
and remove all doubt”*



THANK YOU!



Epworth
Sports+Exercise
Medicine Group





"Hip pointers are not the most serious sports injuries. They're just really embarrassing."