



# F.A.I. indications

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femoroacetabular impingement

Cerca

Ricerca avanzata  
Preferenze

Cerca nel Web  Cerca solo nelle pagine in Italiano

Web

Risultati 1 - 10 su circa 56.500 per femoroacetabular impingement. (0,09 secondi)

....FAI treatment might become a mainstay in joint-preserving treatment of the hip similar to that of hip dysplasia.

R Ganz et al *The Etiology of Osteoarthritis of the Hip An Integrated Mechanical Concept Clin Orthop Relat Res* 2008



to my friend  
E#012  
& con simpatia 4 Rheinhold G. Ganz

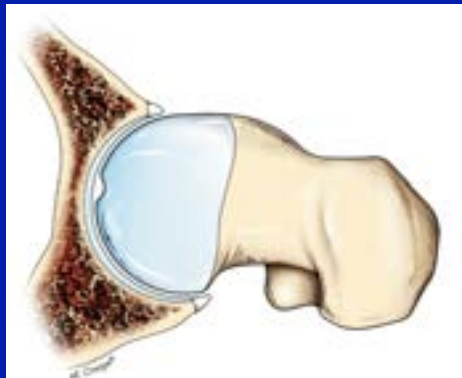


## Normal hip



**Pincer impingement:** excessive cover of the femoral head by the acetabulum, such as in acetabular retroversion and protrusion. Early impingement labrum/neck.

Postero-inferior cartilage injury (contre-coup lesion)



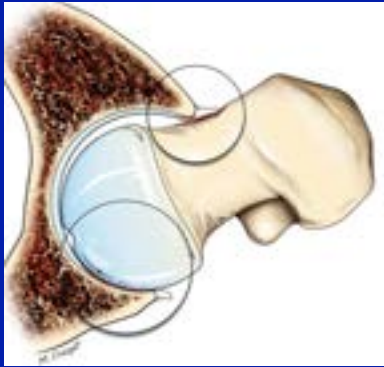
**Cam impingement:** aspheric head/neck junction; there is a reduced femoral head/neck offset. Acetabular articular cartilage delamination



Boy, 13 y, SCFE



## Pincer-type FAI



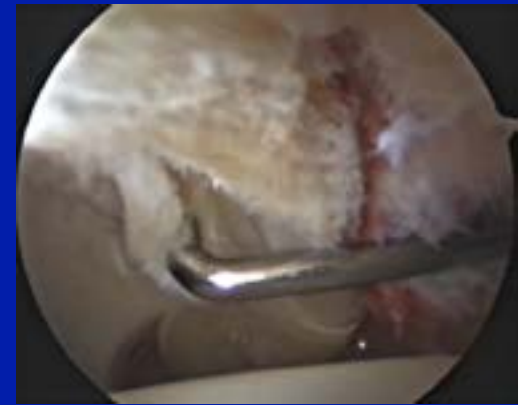
Women 30 to 40 y.  
(yoga, aerobics)



## Cam-type FAI



Men, athletes,  
20 to 30 y.

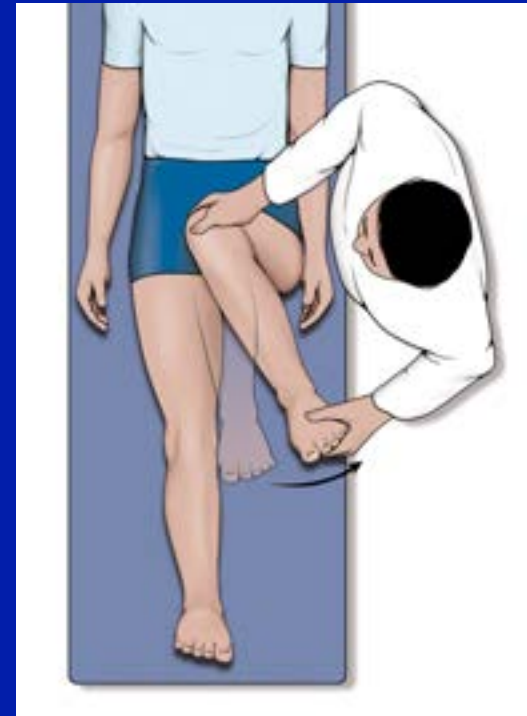


Beck M, Kalhor M, Leunig M, Ganz R Hip morphology influences the pattern of damage to the acetabular cartilage: femoroacetabular impingement as a cause of early osteoarthritis of the hip

*J Bone Joint Surg Br. 2005*

# CLINICAL PRESENTATION

- Anterior groin pain (lateral, posterior), "C" sign
  - prolonged sitting position
  - sitting cross-legged
  - sitting in "4" position
  - getting in and out of a car
  - wear socks/shoes
- Pain in flexion-adduction-internal rotation of the hip
- Reduced or absent internal-rotation



The anterior impingement test was positive in 99% of the patients

# CLINICAL PRESENTATION

## Posterior Impingement Sign

pain in external-rotation of  
hyperextended hip



M Kubiak-Langer et al. Range of motion in anterior femoroacetabular impingement. Clin Orthop Relat Res 2007

# FABER (Patrick) Flexion Abduction External Rotation

- DD lumbar or sacro-iliac disfunction
- 97% positive in FAI

*KSSTA, 2007*

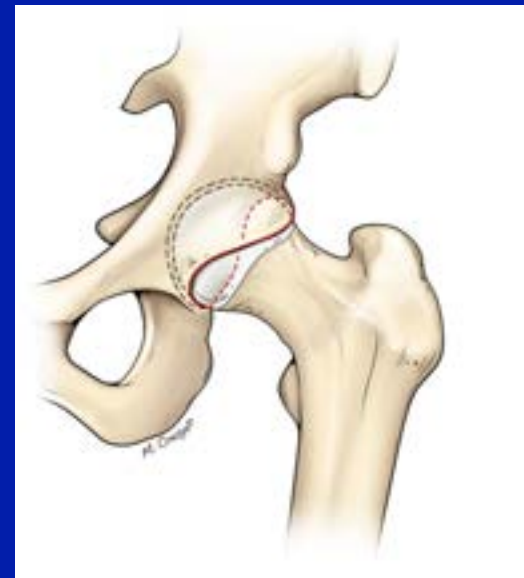
Young man, 19 y., soccer and boxing, right hip pain since 5 months





# RADIOLOGIC EVALUATION

- Plain Film findings well described
  - Pistol grip deformity in CAM-FAI
  - Cross-over sign in Pincer-FAI



# F.A.I. SUSPICION

- PERIACETABULAR OSSICLES ("OS ACETABULI"): suspicion for underlying labral pathology. Also described in dysplastic hips with anterior rim syndrome (Klaue et al. 1991)



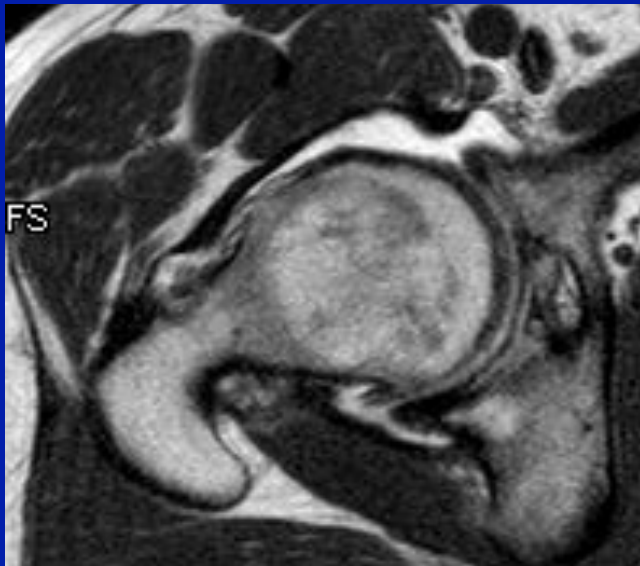
- SYNOVIAL HERNIATION PIT  
soft tissue impingement, compatible with FAI

(Pitt et al. 1982, Daenen et al. 1997, Thomason et al. 1983)



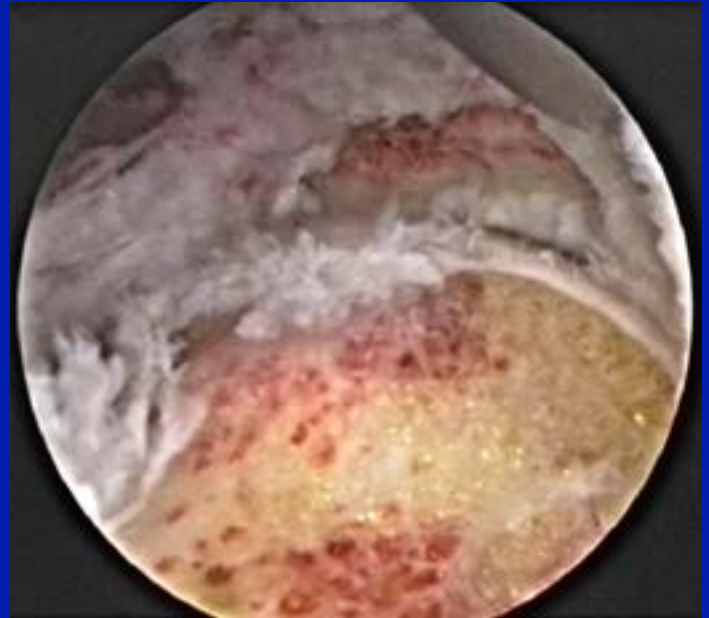
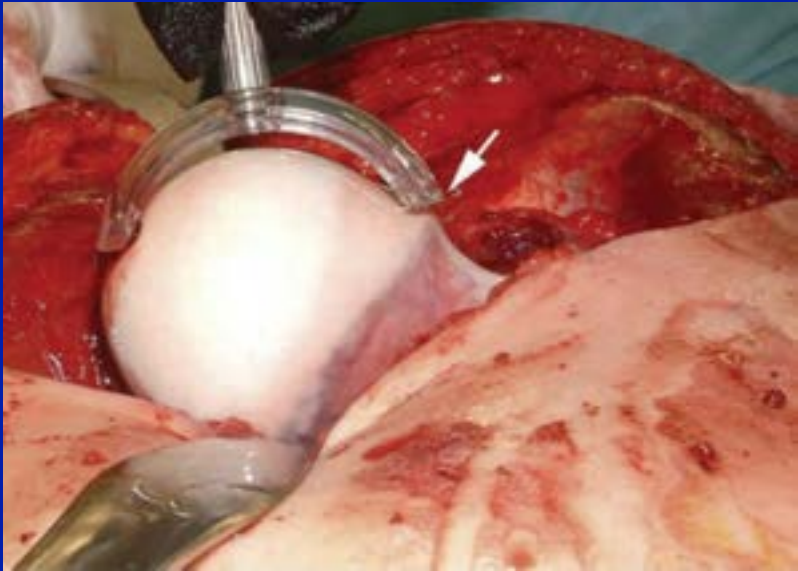
# ARTRO-MR IMAGING

- MR appearance well described ([Kassarjian A et al. 2005](#))
  - Loss of femoral head-neck junction offset
  - Antero-superior labral tears
  - Adjacent chondrosis



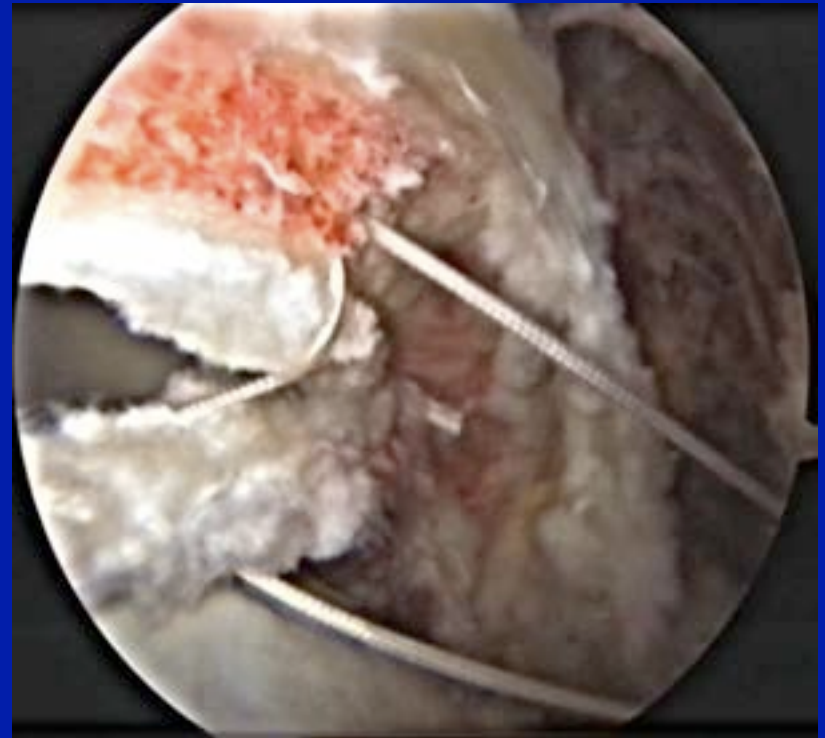
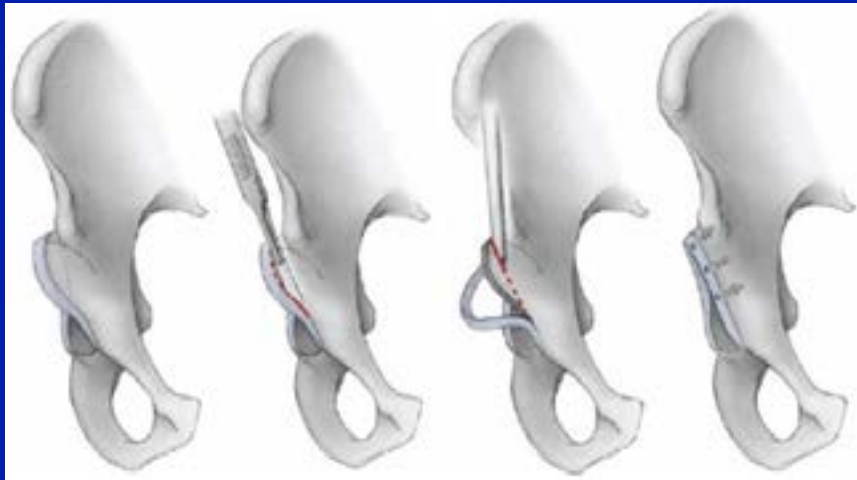
# SURGICAL TREATMENT

## CAM F.A.I.



# SURGICAL TREATMENT

PINCER F.A.I.



# RESULTS

- OPEN: 70-80% good-excellent

Treatment of femoro-acetabular impingement: preliminary results of labral refixation. Surgical technique. N. Espinosa, M. Beck, DA. Rothenfluh, R. Ganz, M. Leunig. JBJS Am 2007; 89:36-53

- MINI-OPEN: Satisfactory result (Tönnis score)

6 months: 93.7% (T0), 91.8% (T1), 58.3% (T2)

2 years: 96.8% (T0), 93.4% (T1), 45.8% (T2)

Treviño-Garza O et al. 2009

- ARTHROSCOPY: effective 67-93% at a mean of 26 m. post-op

Bedi A et al. 2008

# SUCCESSFUL TERMS

- Correct diagnosis of FAI
- No extra-articular pathology (indirect Pincer)
- No cartilage damage

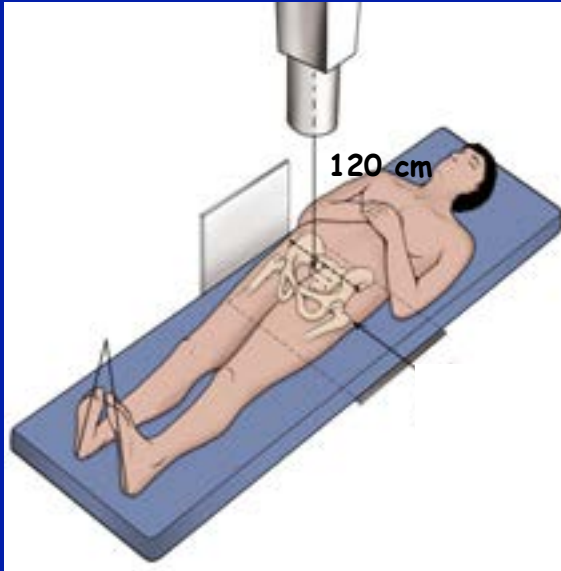
# CORRECT DIAGNOSIS OF FAI

## MIXED CAM + Pincer

- 42% Allen D et al 2009
- 86% Philippon M 2009



# PINCER DIAGNOSIS



Well-centered AP view of the pelvis: distance between the sacrococcygeal joint and pubic symphysis measuring about 3 to 5 cm (3.2 cm male, 4.7 cm female) (Siebenrock KA et al., CORR 2003), or when the coccyx is about 1 cm from the pubic symphysis (Giori NJ, Trousdale RT, CORR 2003)

Reclination of the pelvis can underestimate the appearance of retroversion (crossover sign), and inclination can overestimate the findings (Armfield DR et al., Clin Sports Med 2006)

# ACETABULAR RETROVERSION

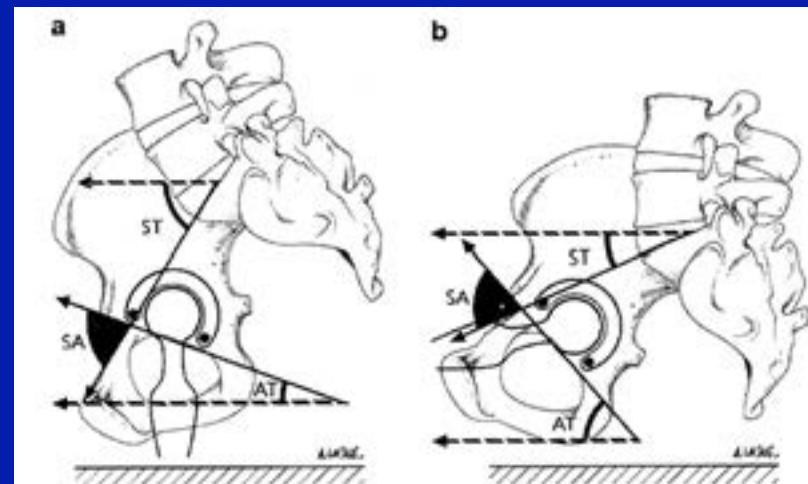
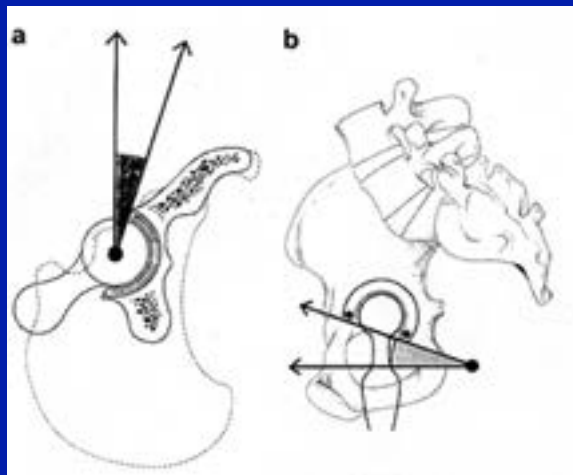
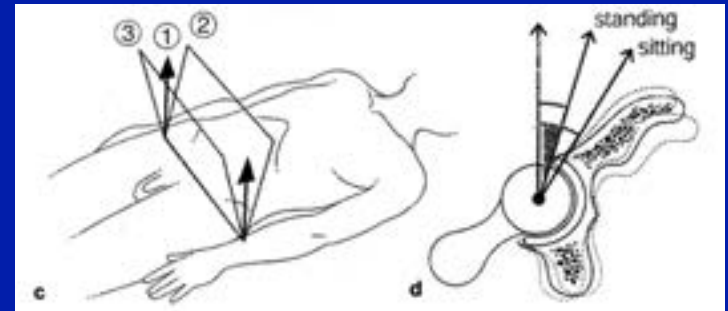
- The diagnosis is difficult
  - "**Cross-over sign**": sensitivity 92%, specificity 55%, positive predictive value 59%, negative predictive value 91% (Dandachli W et al. 2009)
  - "**Posterior wall sign**": sensitivity 81%, specificity 53%, positive predictive value 54%, negative predictive value 80% (Dandachli W et al. 2009)
  - The version of the acetabulum changing from cranial to caudal to become naturally increasingly anteverted (Maruyama M et al. 2001; Anda S et al. 1991)

# SUCCESSFUL TERMS

- Correct diagnosis of FAI
- No extra-articular pathology (indirect PINCER)
- No cartilage damage

# EXTRA-ARTICULAR PATHOLOGY (indirect PINCER)

- Lumbar lordosis
- Lumbar stiffness
- Coxa vara
- Femoral-neck retroversion



# SUCCESSFUL TERMS

- Correct diagnosis of FAI
- No extra-articular pathology (indirect PINCER)
- No cartilage damage

# CARTILAGE INJURY

- Often associated with labral tears and FAI
- Accurate assessment can be difficult due to its thinness and spherical contours (Hodler J et al., 1992)
- Cartilage assessment is critical ... outcomes are linked to the degree of cartilage abnormality (McCarthy, 2004)

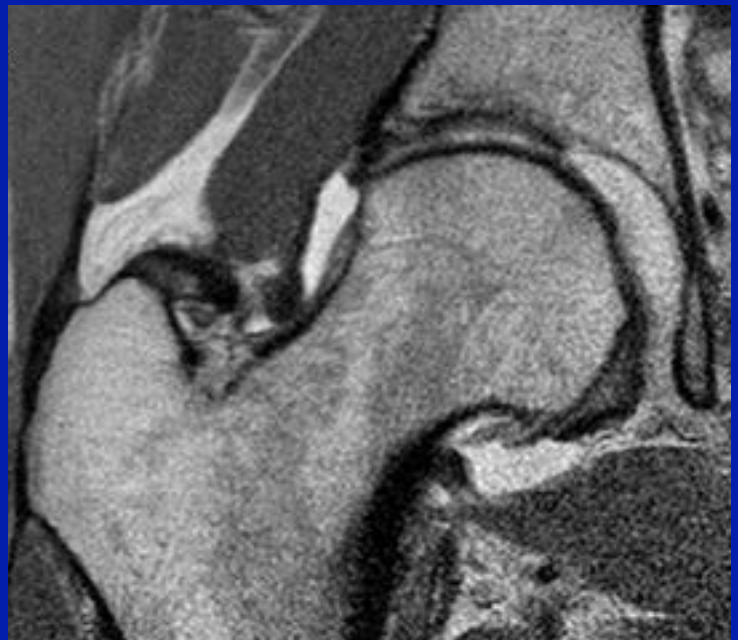
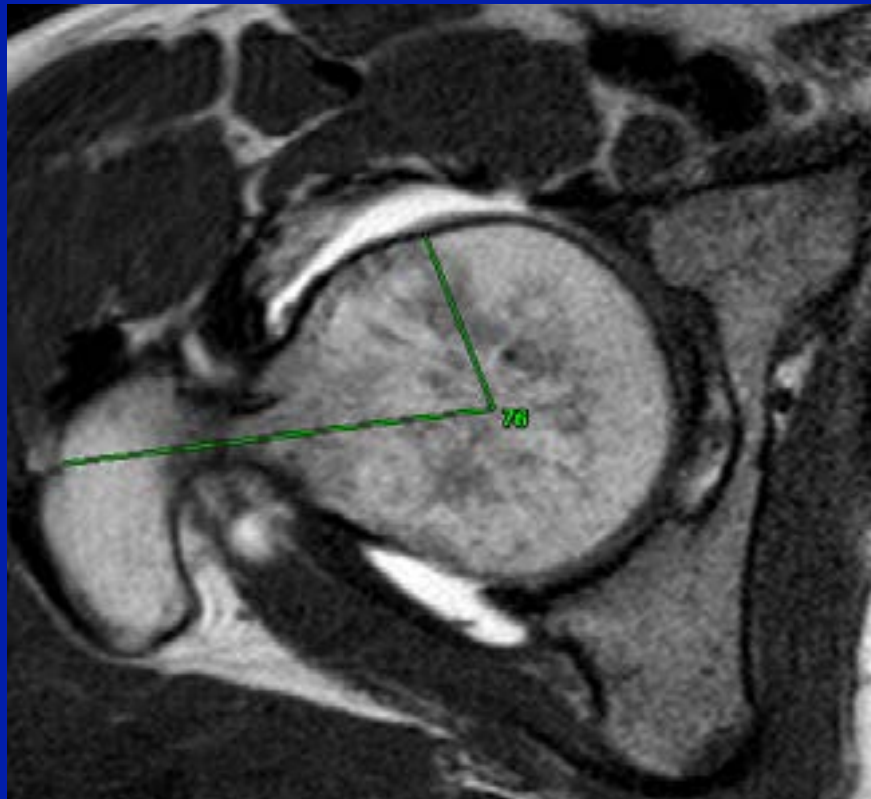
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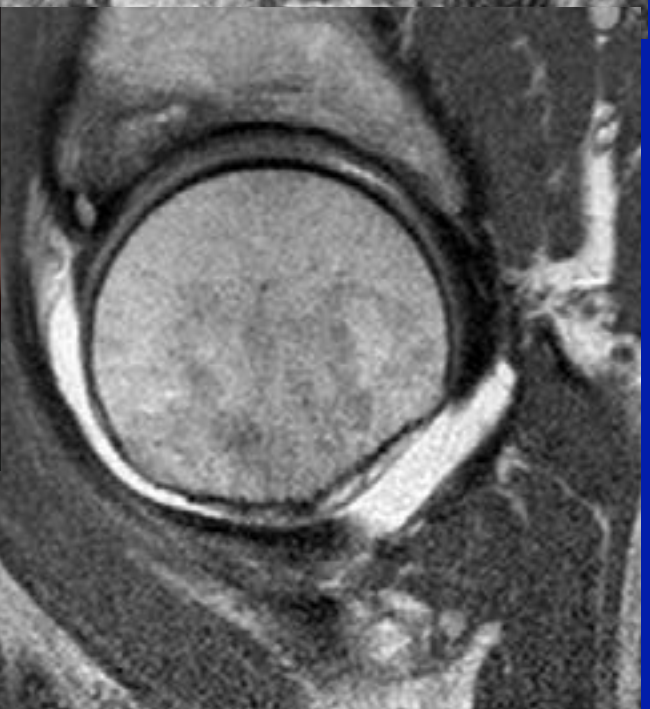
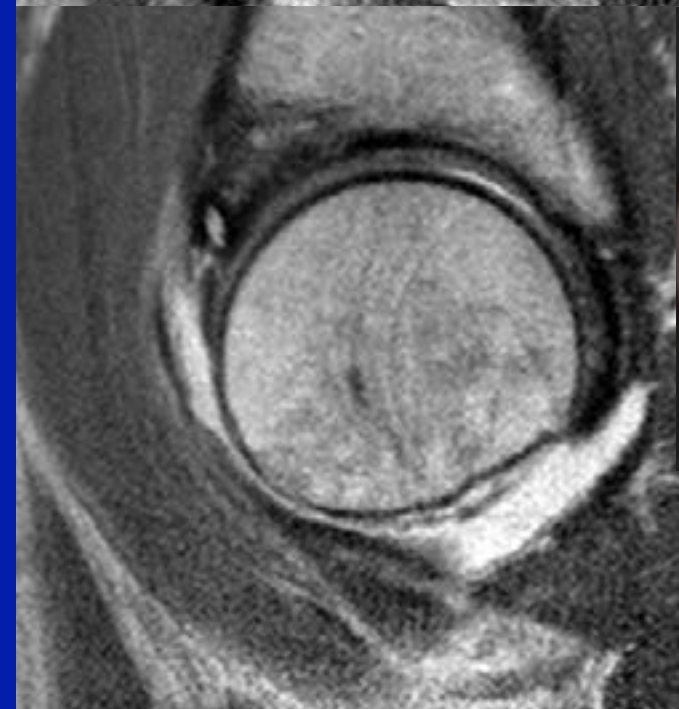
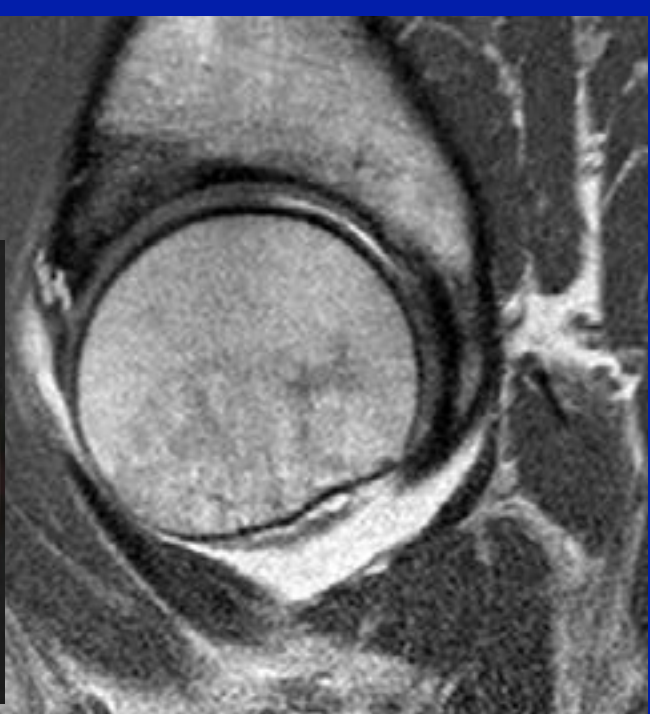
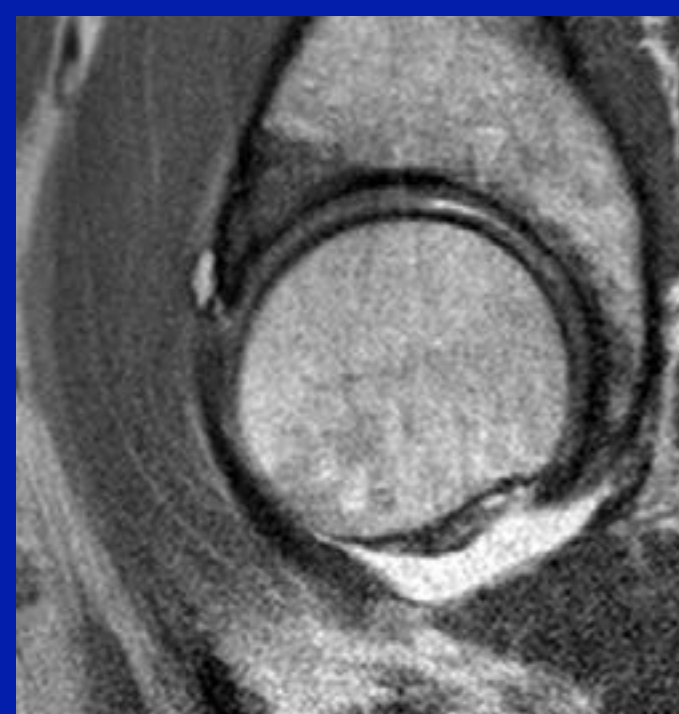
- MR arthrography for cartilage injury detection: sensitivities 47% - 79%; specificities 77% - 89%  
(Kennedy JA et al 2004, Schmid MR et al. 2003)
- More difficulty assessing acetabular side cartilage lesions  
(Kennedy JA et al 2004, Schmid MR et al. 2003)
- MRI underestimated the degree of articular cartilage injuries when compared with arthroscopic findings  
(Armfield DR et al., Clin Sports Med 2006)

# Female 48 y, left hip painful





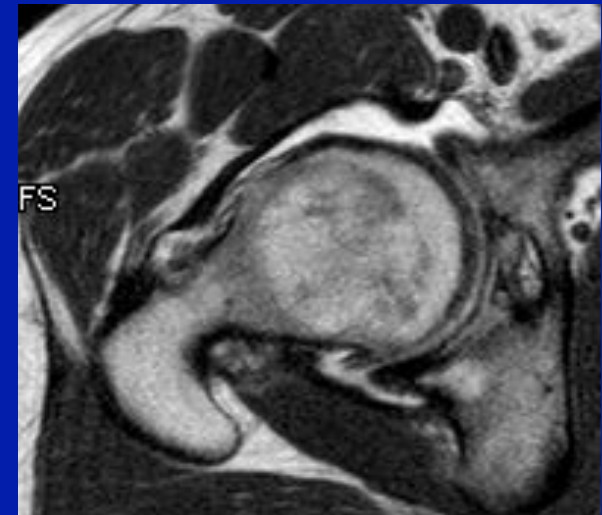




# NEGATIVE PREDICTIVE FACTOR

- Lateralized hip rotation center

Man, 31 y.  
judo teacher



# NEGATIVE PREDICTIVE FACTOR

- Female over 40
- Osteoarthritis ( $\geq$  Tönnis 2)



Man, 45 y



# SUMMARY

- FAI is a diffuse and frequent pathology
- Has been recognised as a cause of early osteoarthritis of the hip
- Encouraging results can be obtained with appropriate indication and early surgical treatment
- The clinical situation ultimately dictates the need for surgical intervention
- Is difficult to interpret the treatment of FAI unless a standardised way of assessing the morphology of a hip is established, specially for retroversion

THANKS