# LINKS

NORMAL

- Anterior pelvis Radiology Core Lecture Series
- HIP MRI ANATOMY STATdx
- PELVIS/HIP MEASUREMENTS & LINES STATdx

- MR HIP IAMOS
- MR LOWER LIMB IAMOS
- LOWER LIMB DRAWINGS IAMOS

PATHOLOGY

- DDX THIGH PAIN STATdx

- PELVIC RING DISRUPTION STATdx
- ACETABULUM FX STATdx
- FEMORAL HEAD FX STATdx
- FEMORAL NECK FX STATdx
- TROCHANTER AND INTERTROCHANTERIC FX STATdx
- SUBTROCHANTERIC AND FEMORAL SHAFT FX STATdx
- PELVIS STRESS FX STATdx
- HIP DISLOCATION STATdx
- ACETABULAR LABRAL TEAR STATdx
- LIGAMENTUM TERES INJURY STATdx

- ARTHROPLASTY RADIOLOGY ASSISTANT
- HIP/PELVIS/FEMUR TRAUMA POST OP IMAGING STATdx
- INTRAMEDULLARY NAIL/ROD STATdx
- SCREW FIXATION STATdx
- ACETABULAR LABRAL INJURY POST OP IMAGING STATdx

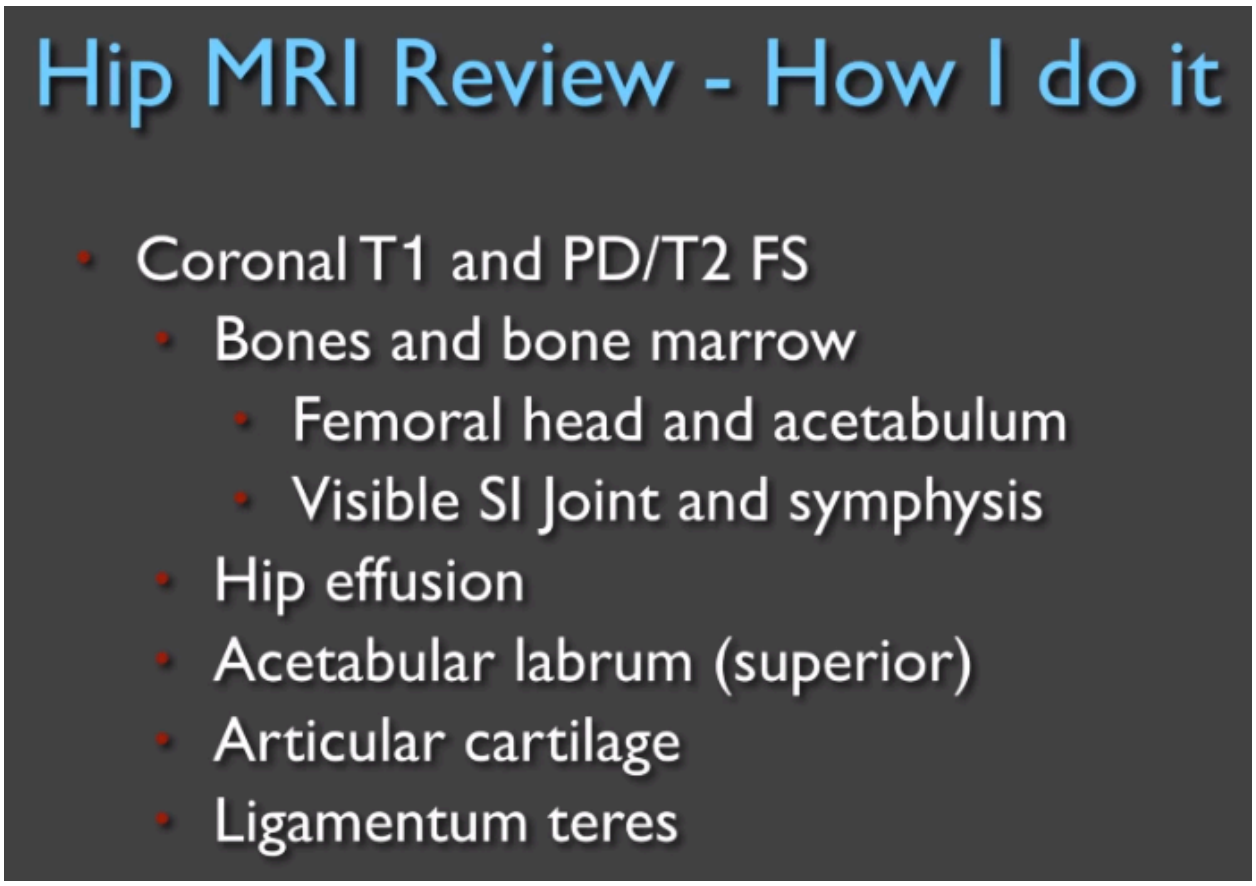
- TRANSIENT BONE MARROW EDEMA STATdx
- OSTEONECROSIS OF HIP STATdx
- FEMOROACETABULAR IMPINGEMENT MORPHOLOGY STATdx

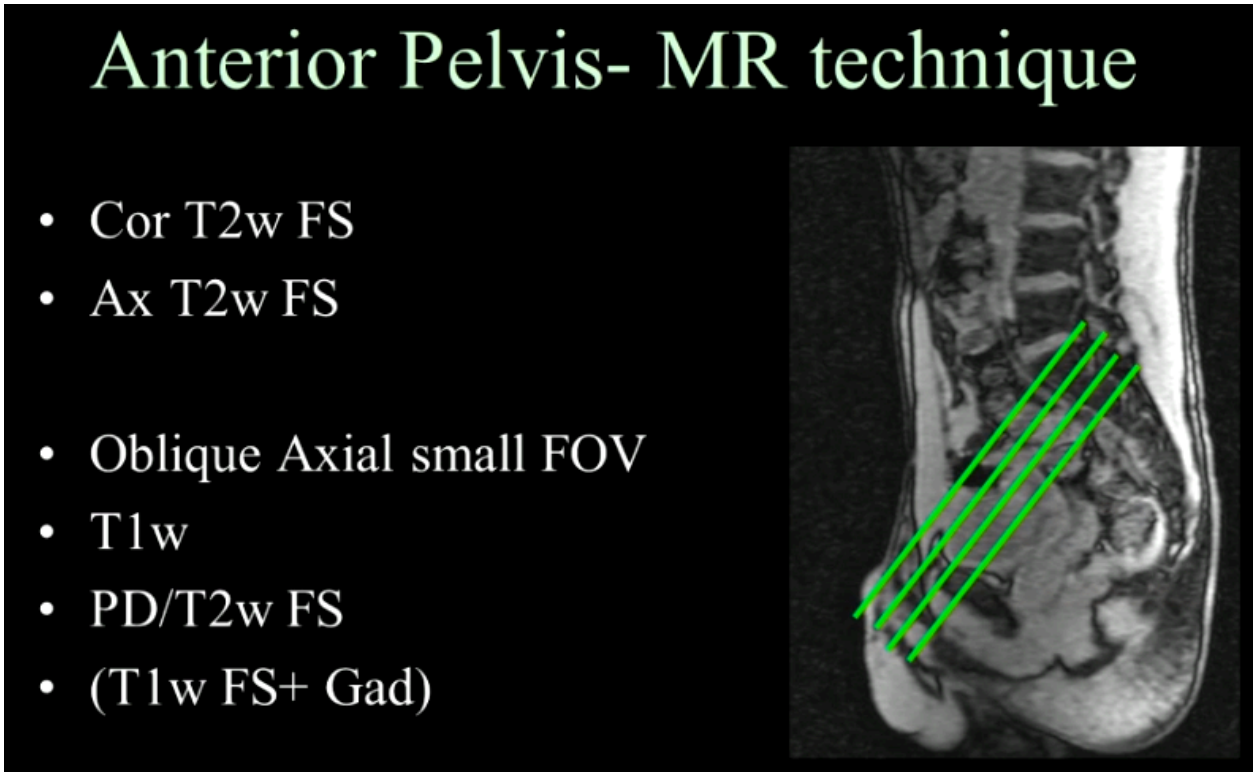
VIDEOS

- IMAGING OF THE HIP
-

# GENERAL

- PD without fat sat is insensitive to edema






# SEARCH PATTERN

Hx, indication, priors

Assess study adequacy, technique and limitations

Look at localizers

Bone cortex & marrow

- Look for cortical breaks/fractures, osteophytes, loose bodies and heterotopic ossification
- Check for marrow replacement (signal darker than adjacent mm) and distributions of hematopoietic marrow discordant with patient's age/medical conditions

Examine the lower lumbar spine

- Vertebral bodies / discs for deformity, degenerative changes
- Check posterior elements
- Assess spinal canal for mass lesions

- Assess neuroforamina for stenosis.

Assess the sacrum and look for insufficiency fx

Assess bony pelvis

Look at the acetabula
- Assess for abnormal version and developmental dysplasia. Make sure the superior aspect of the acetabulum is horizontal on coronal images.
- Assess for pincer type FAI. Look for focal acetabular retroversion. Refer to prior radiograph or CT for coxa profunda and protrusio.
- Look for osteophytes.

Femurs
- In appropriate populations, look for SCFE or AVN
- Check for osteochondral lesions.
- Assess for deformity / collapse of the femoral head.
- Look for CAM-type FAI at the head-neck junction
- Assess the neck and visualized shaft for fx / deformity

Assess tendinous insertions about the hip
- Look for avulsion, edema and bursa fluid / bursitis.
    - Iliopectineal line / pubic symphysis: rectus abdominis and adductors
    - ASIS (sartorius)
    - AIIS (rectus femorus indirect head)
    - Superior acetabular labrum (rectus femorus direct head)
    - Ischial tuberosity (hamstrings)
    - Iliac crests (quadratus laborum)
    - Greater trochanter (gluteus medius / minimus and hip external rotators)
    - Lesser trochanter (iliopsoas)
- Look closely for fluid signal along the course of the iliopsoas and at the greater trochanter (2 common places for bursitis)

Assess sacroiliac joints
- Look for inflammatory change on both sides of joint (axial and coronals)
- Look for diastasis, erosion / destruction, ankylosis, degenerative changes.

Pubic symphysis
- Look for erosions, degenerative change, osteitis, and diastasis.

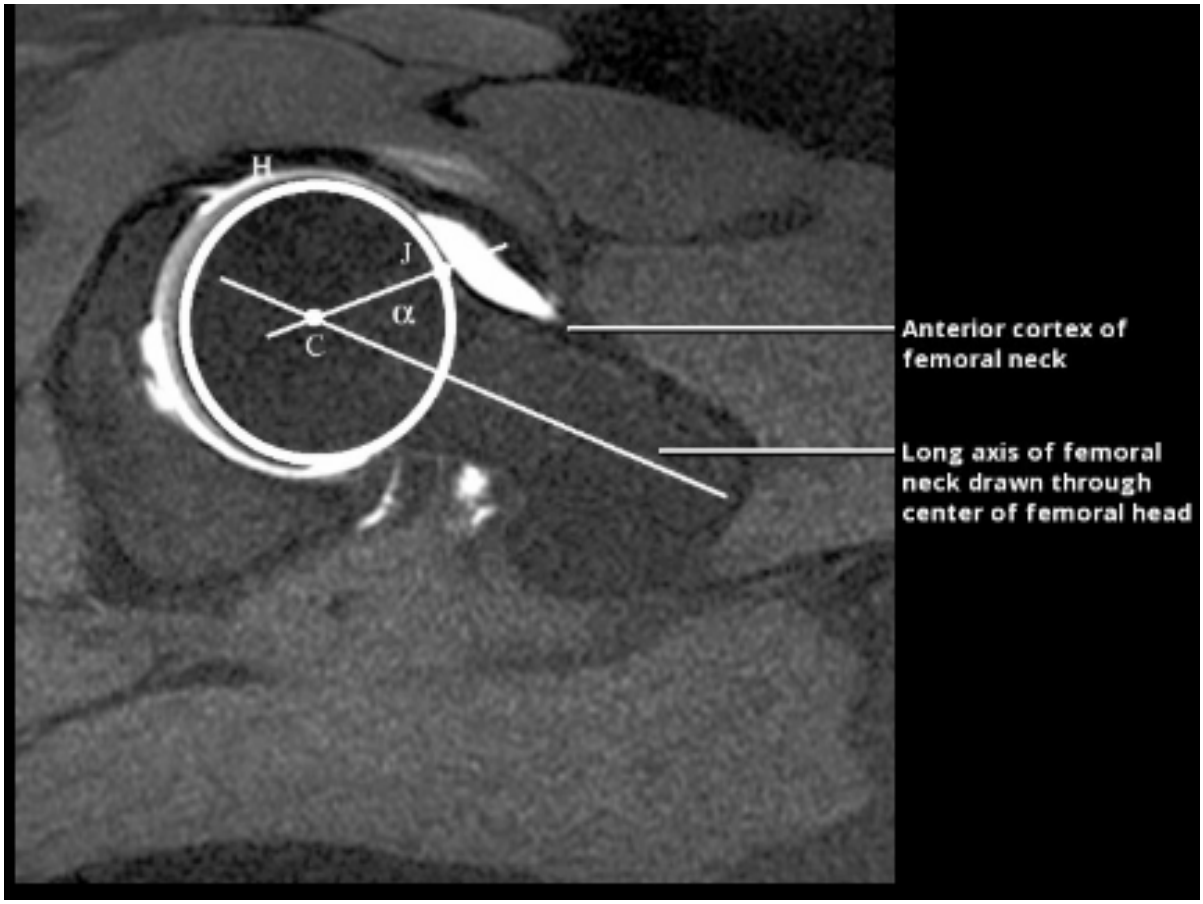
Assess femoroacetabular joints
- Look for joint effusion
- Look at the labrum for tear (most commonly anterosuperior quadrant)
- Assess the cartilage (best on arthrographic images if obtained)

- Otherwise, the PD and fluid sensitive sequences, sagittals and coronals
- Lok for subchondral marrow cystic change and edema associated with any findings. Also look for these to clue you into potential areas of cartilage loss which may be hard to see.

Pelvic viscera
- Bowel (mass lesions, inflammation, fistula, etc)
- Reproductive organs
    - Prostate, seminal vesicles, spermatic cord, testest in males
    - Uterus, cervix, vagina, fallopian tubes/adnexa, ovaries in females
- Ureters, bladder, urethra
- Retroperitoneum and pelvic side walls for adenopathy
- Look for ascites, collections, mass lesions

SQ & MM
- COrrelate w fluid sensitive images
- Assess SQ tissues
- Assess the mm signal
- Look for collections or effusions

# MEASUREMENTS




The α angle is a measure of head-neck offset. Increased α angle is associated with femoroacetabular impingement. The α angle is constructed on oblique axial image. Critical points include: Circle H (best fit to circumference of femoral head), point C (center of femoral head), point J (point where circle H crosses the anterior femoral neck cortex), line CJ (from center of femoral head to point J). The α angle is the angle between the long axis of femoral neck and the line C-I.

>55 degrees is abnormal especially if sx of hip impingement are present.
Draw line through femoral neck bisecting the center of the femoral head. Draw second line running from the center of the femoral head to the most proximal abnormal contour of the femoral head/neck.

- α (alpha) angle
  - Measure of femoral head-neck offset
    - Decreased offset, or bony prominence, between femoral head and neck may cause femoroacetabular impingement
  - Performed on oblique axial MR or CT
  - Slice along center of femoral neck axis
  - Create best fit circle of femoral head
  - Draw line bisecting femoral neck axis
  - Identify junction of femoral neck and circle outlining femoral head
  - α° is angle between femoral neck axis at center of femoral head and point where femoral neck intersects circle outlining femoral head
- 50° or less is normal
  - Larger angles associated with femoroacetabular impingement

# NOTES

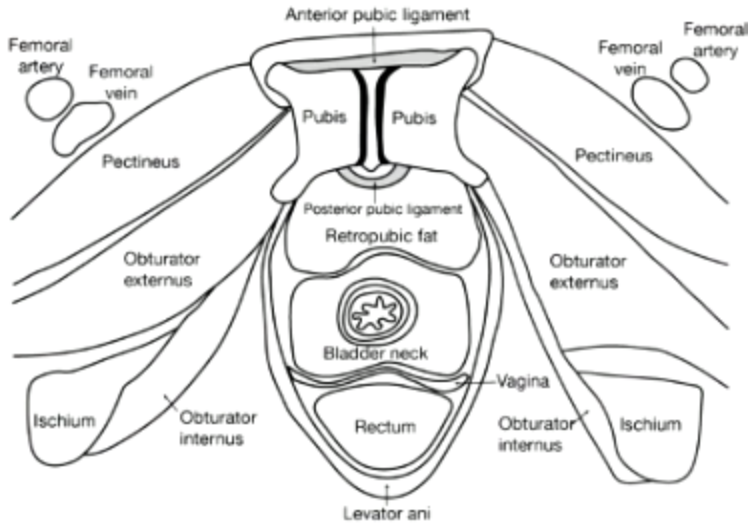
BIomechanics of anterior pelvis:

- Strut b/n lower limb and spine
- Anterior tilt
- Shearing forces on symphysis and parasymphysis tissues.

Interpubic disc and cleft

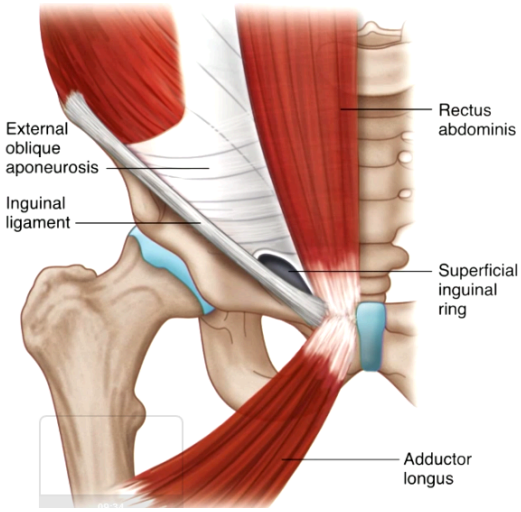
- Disc
  - Fibrocartilage
  - Similar structure to intervertebral disc
  - Wider and shorter in females
- Primary cleft
  - Slit like physiological fluid filled cavity
  - superior -posterior upper ½
  - Larger and more prevalent in women

Ligamentous support: superior and inferior pubic ligament

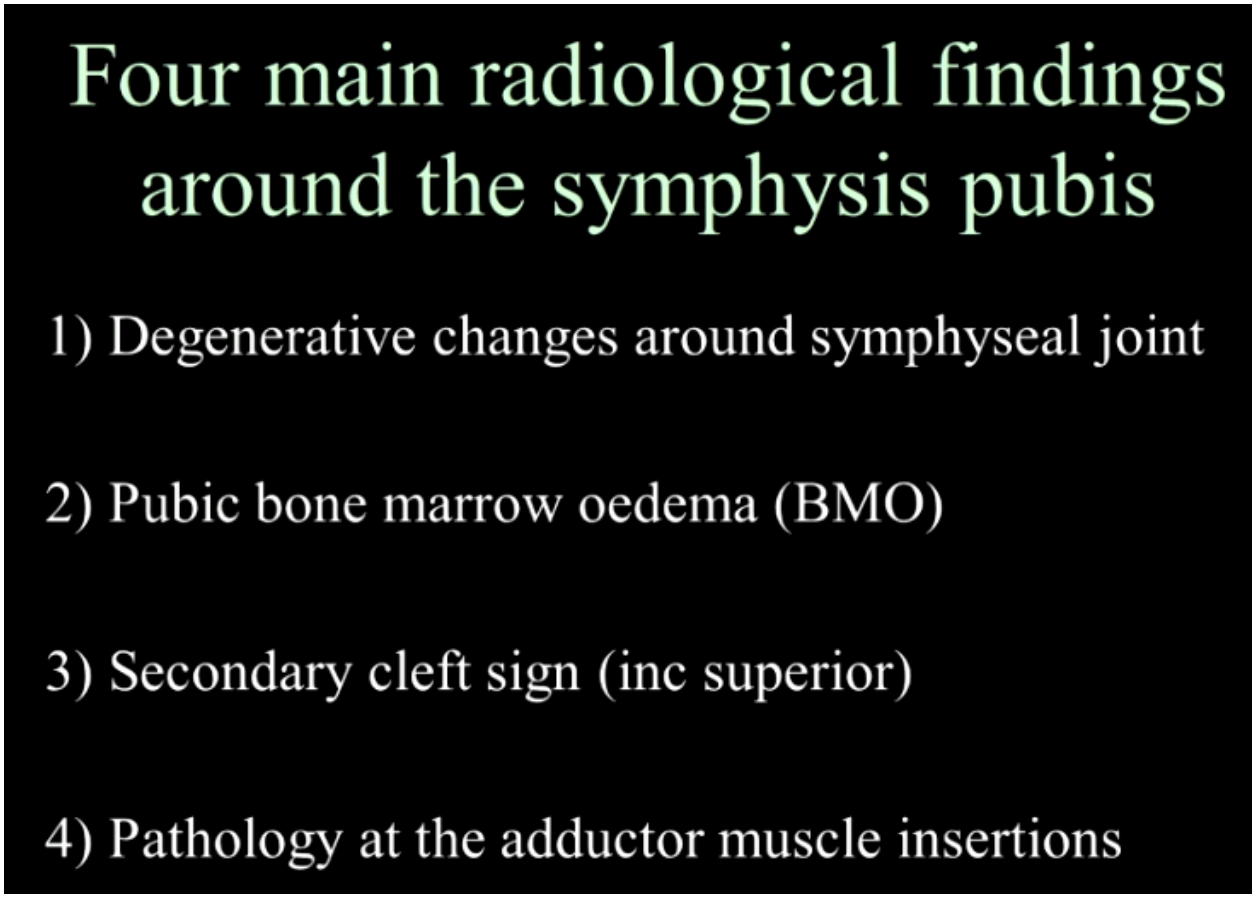



Relationships w surrounding soft

- Rectus abdominis
- Adductor longus
- Ilioinguinal ligament
- Fusion w gracilis
- Adductor longus and brevis

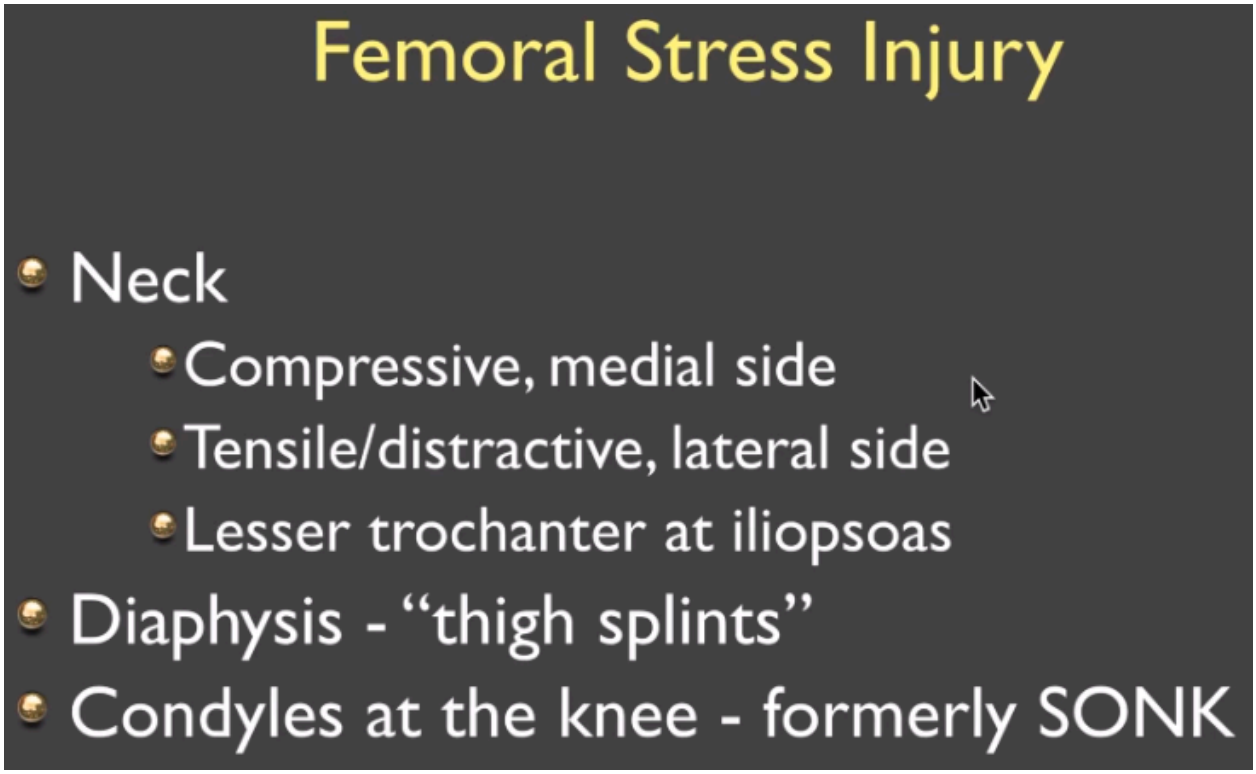



Postpartum injury: ligament laxity, distraction forces, pelvic instability




Cortical changes
Public bone marrow edema

# PATHOLOGY




## FAI

Describe findings suggestive of FAI with disclaimer that these findings may predispose to impingement in the presence of pain.