Lower limb joints

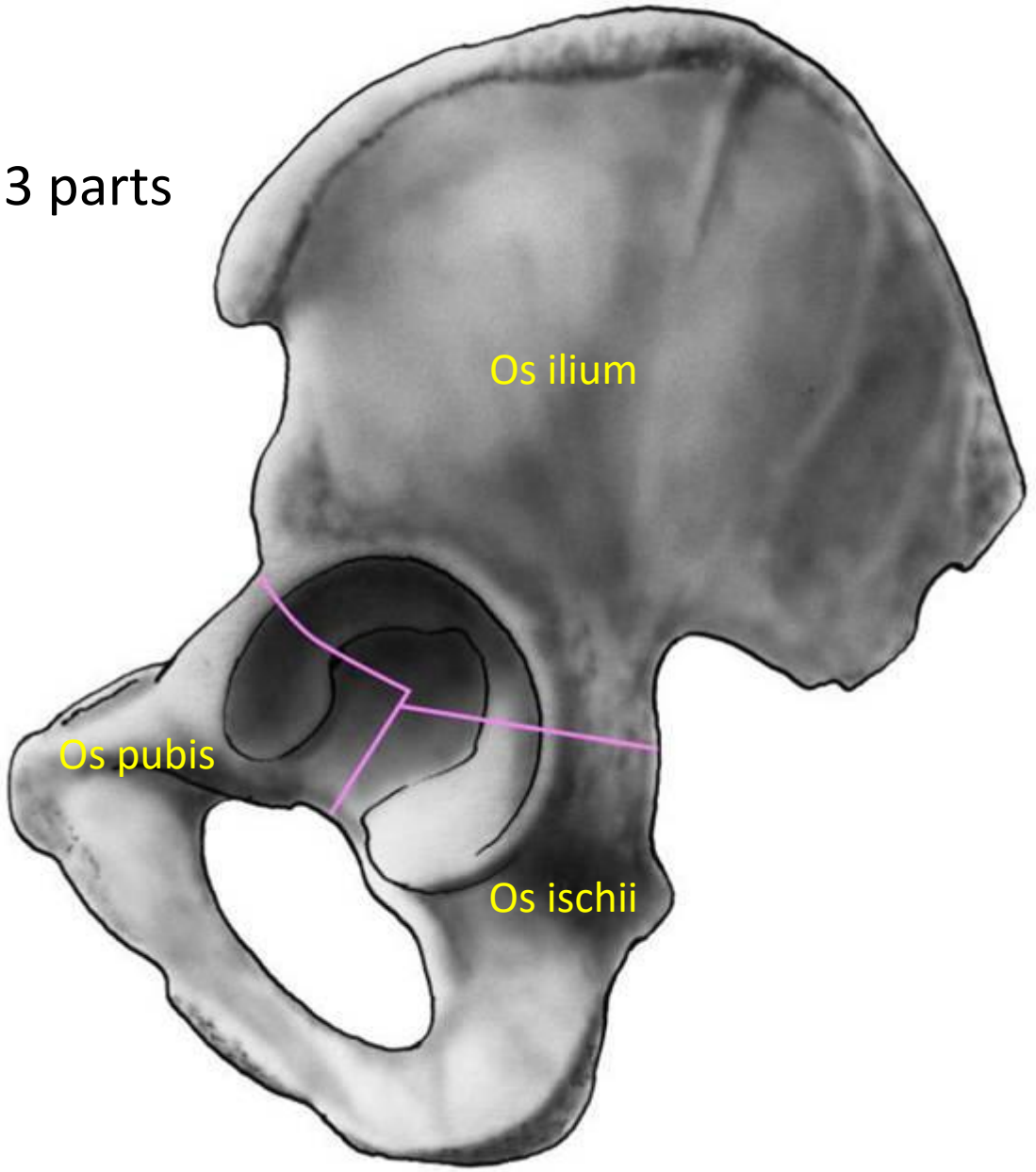
Veronika Němcová

Pelvis

Os sacrum
Sacroiliac joint
Os coxae
Symphysis pubica

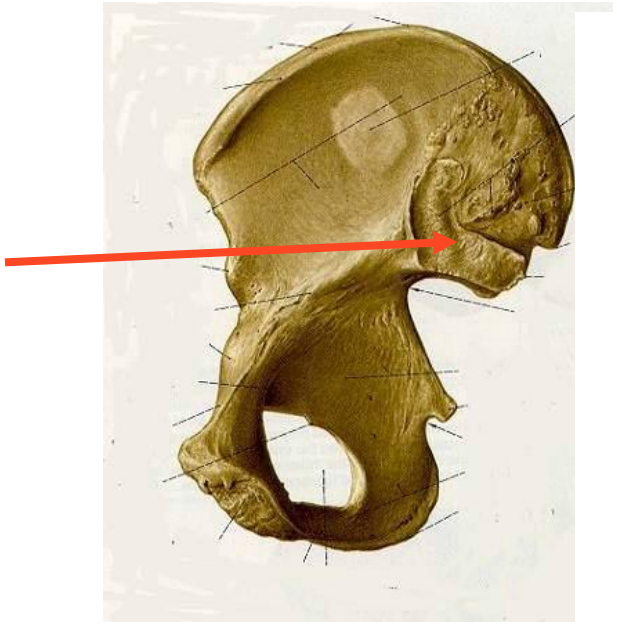
http://anat.lf1.cuni.cz/muzeum/alb1/index.htm

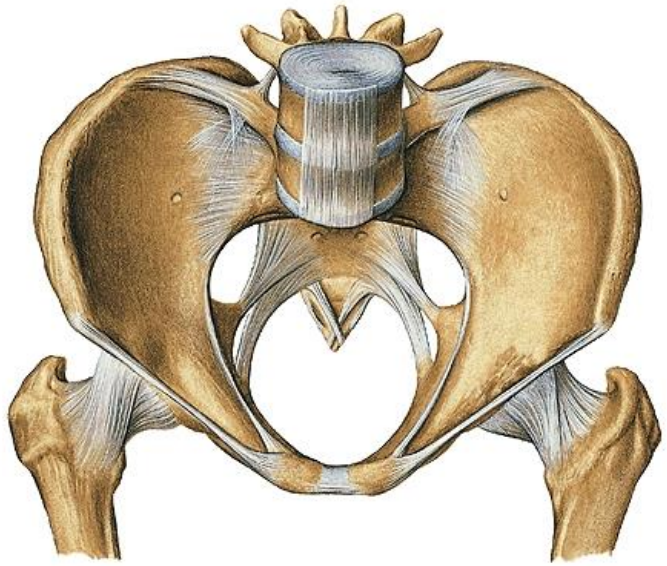
Os coxae – 3 parts



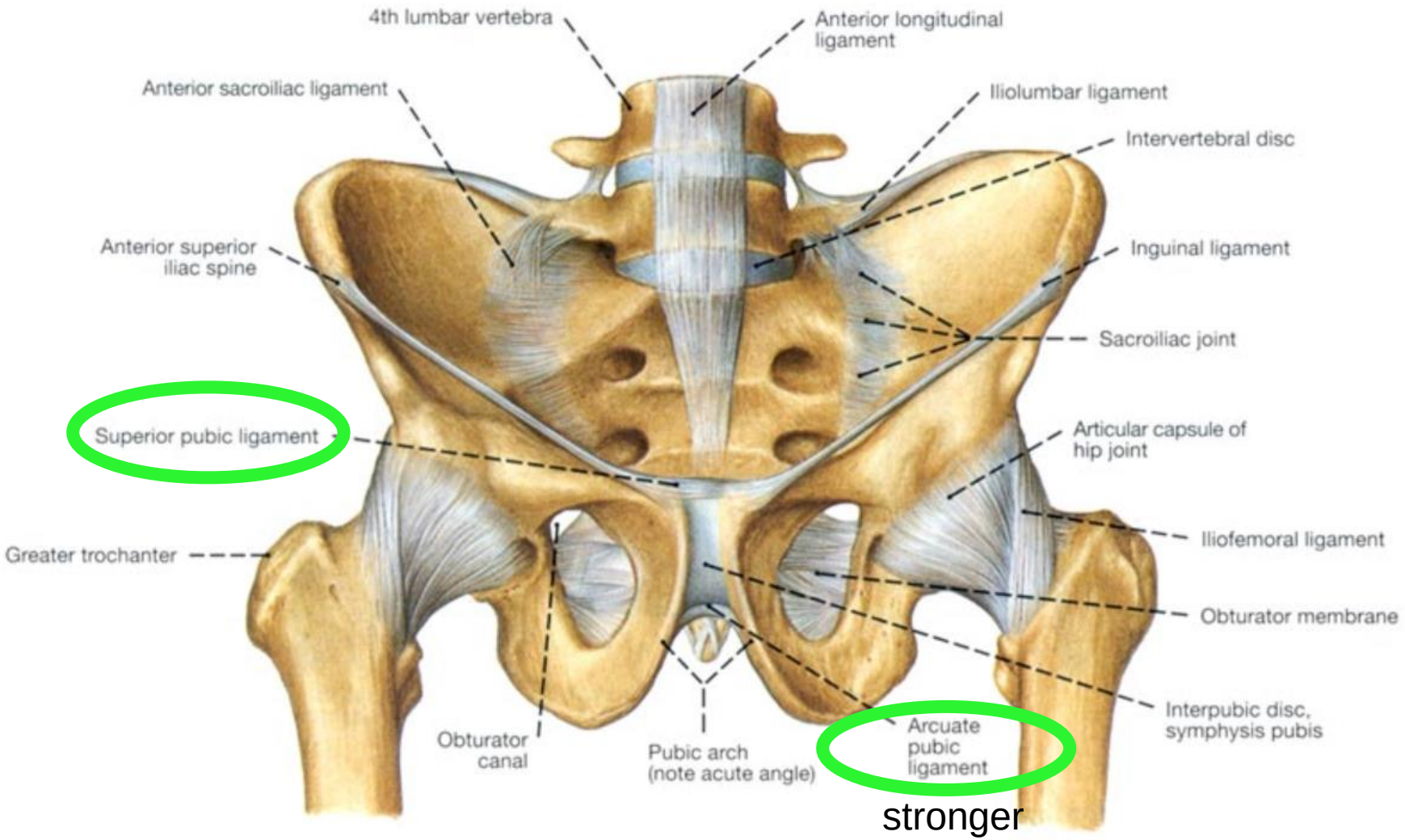
Sacroiliac joint – auricular surace of ilium and auricular surface of sacrum

- Amphiarthrosis – only very small movements
- Fibrous cartilage
- Sacroiliac ligaments (ventral, dorsal, interoseous)
- Iliolumbal ligament

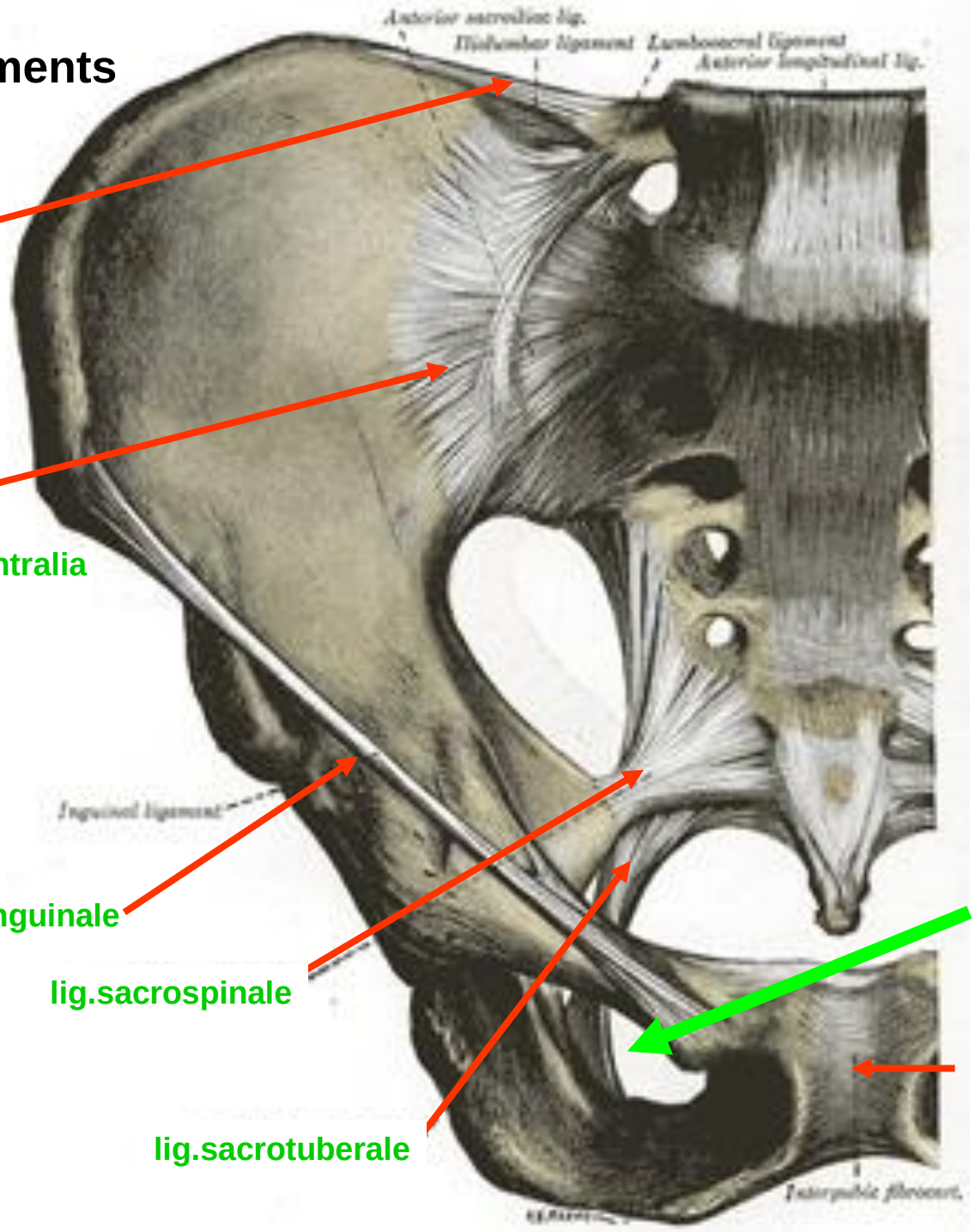




Pubic symphysis – fibrous cartilage



Pelvis – ligaments



lig.iliolumbale

ligg.sacroiliaca ventralia

lig.inguinale

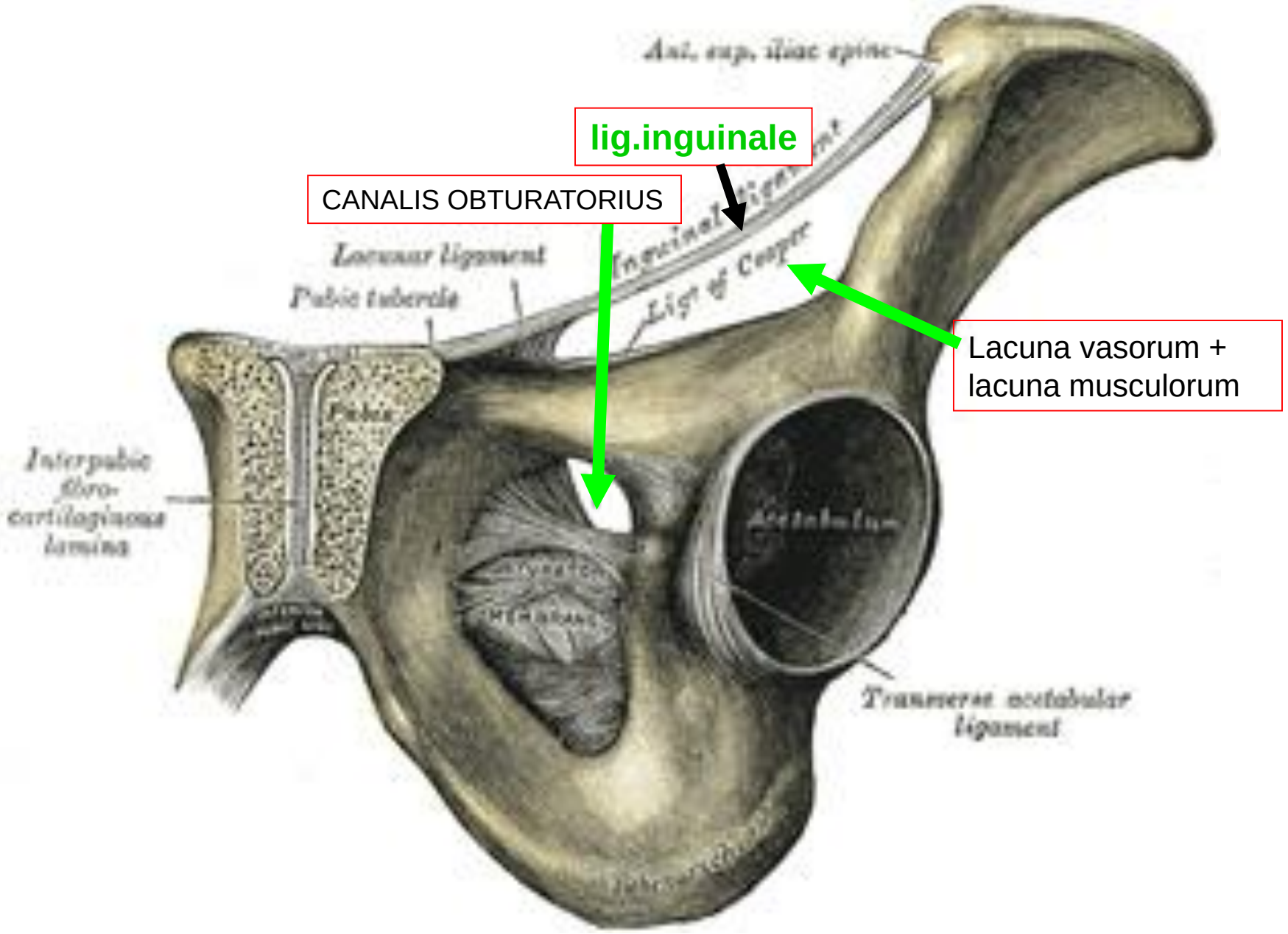
lig.sacrospinale

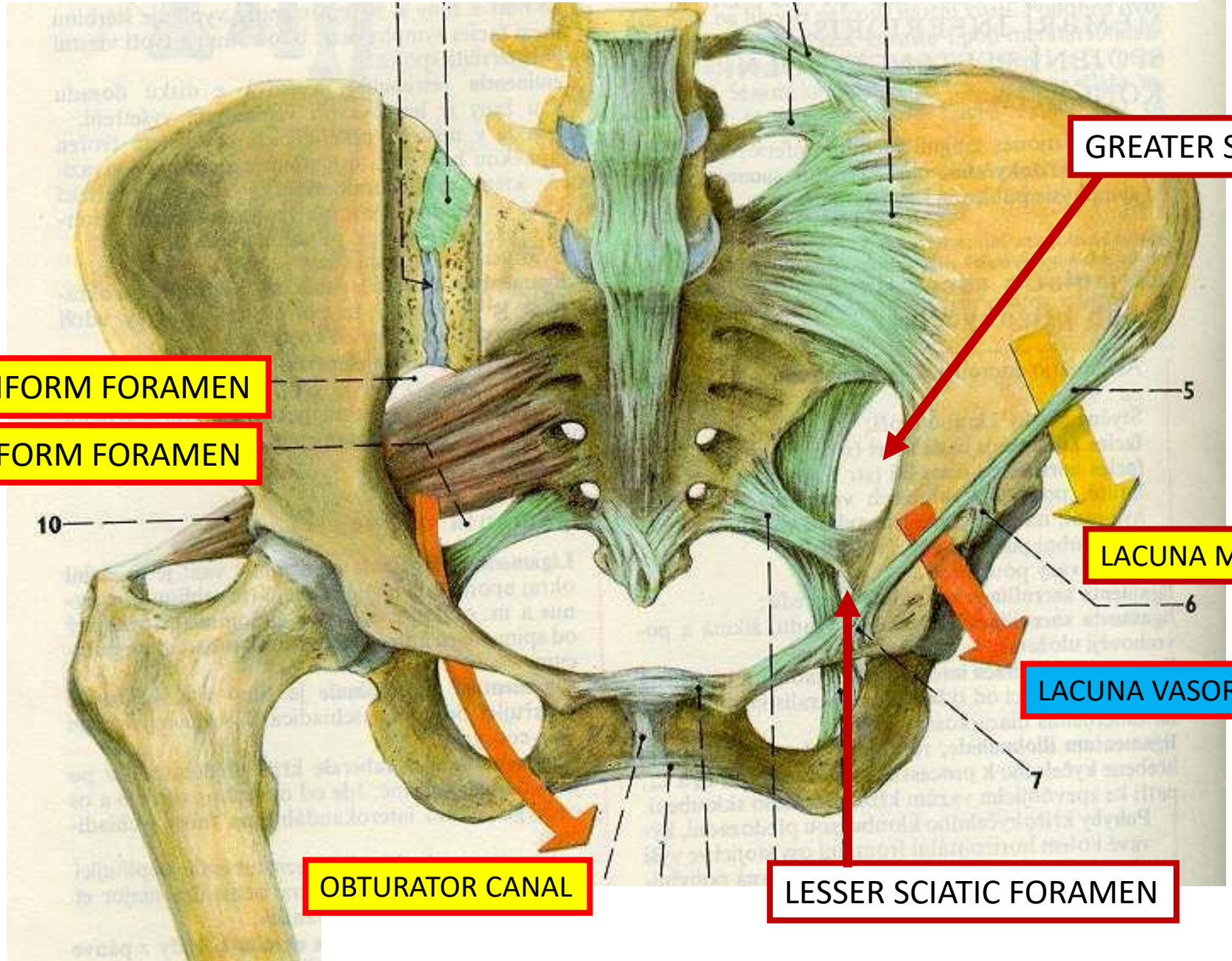
lig.sacrotuberale

FORAMEN OBTURATUM

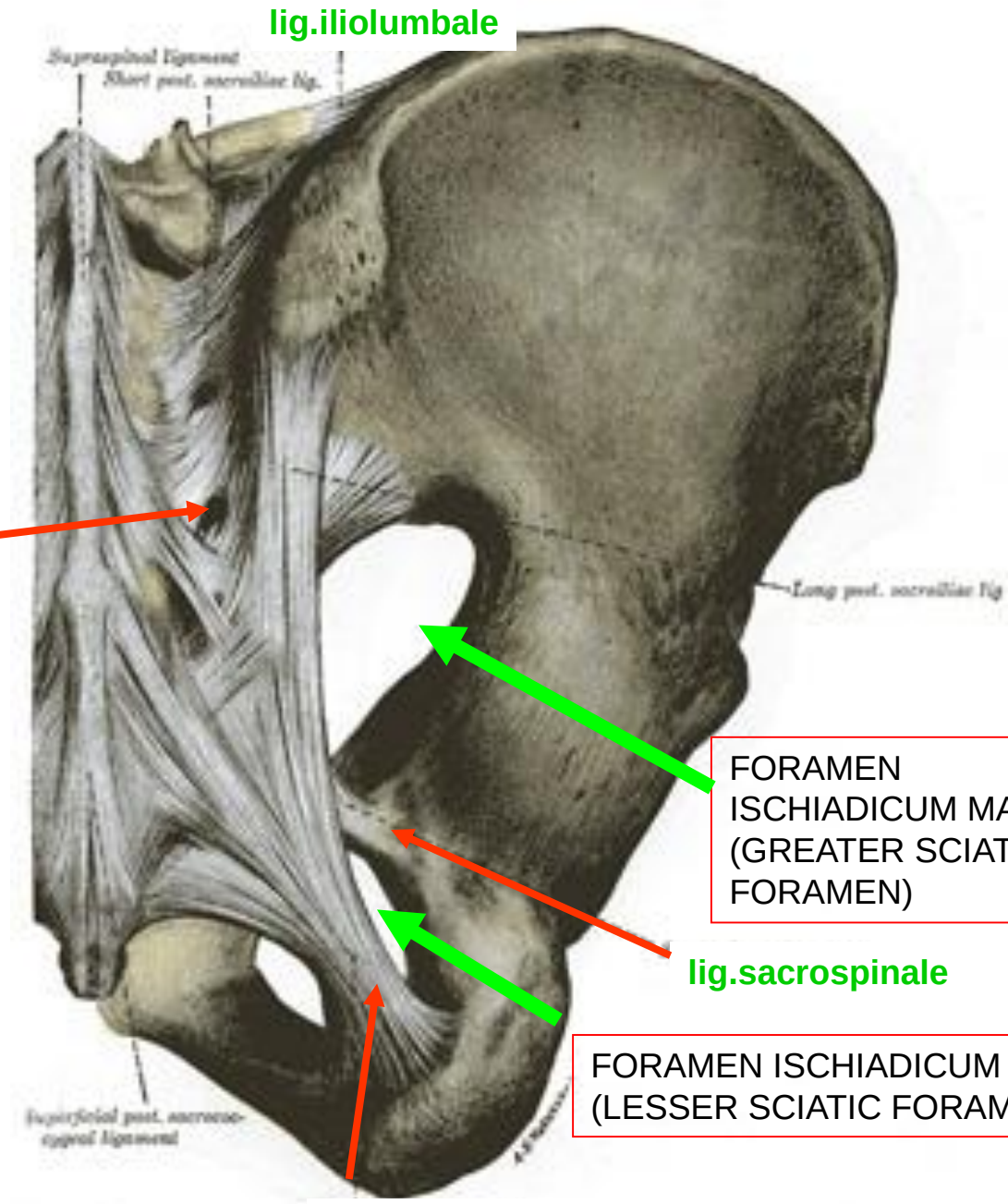
symphysis pubica

Pelvis – ligaments

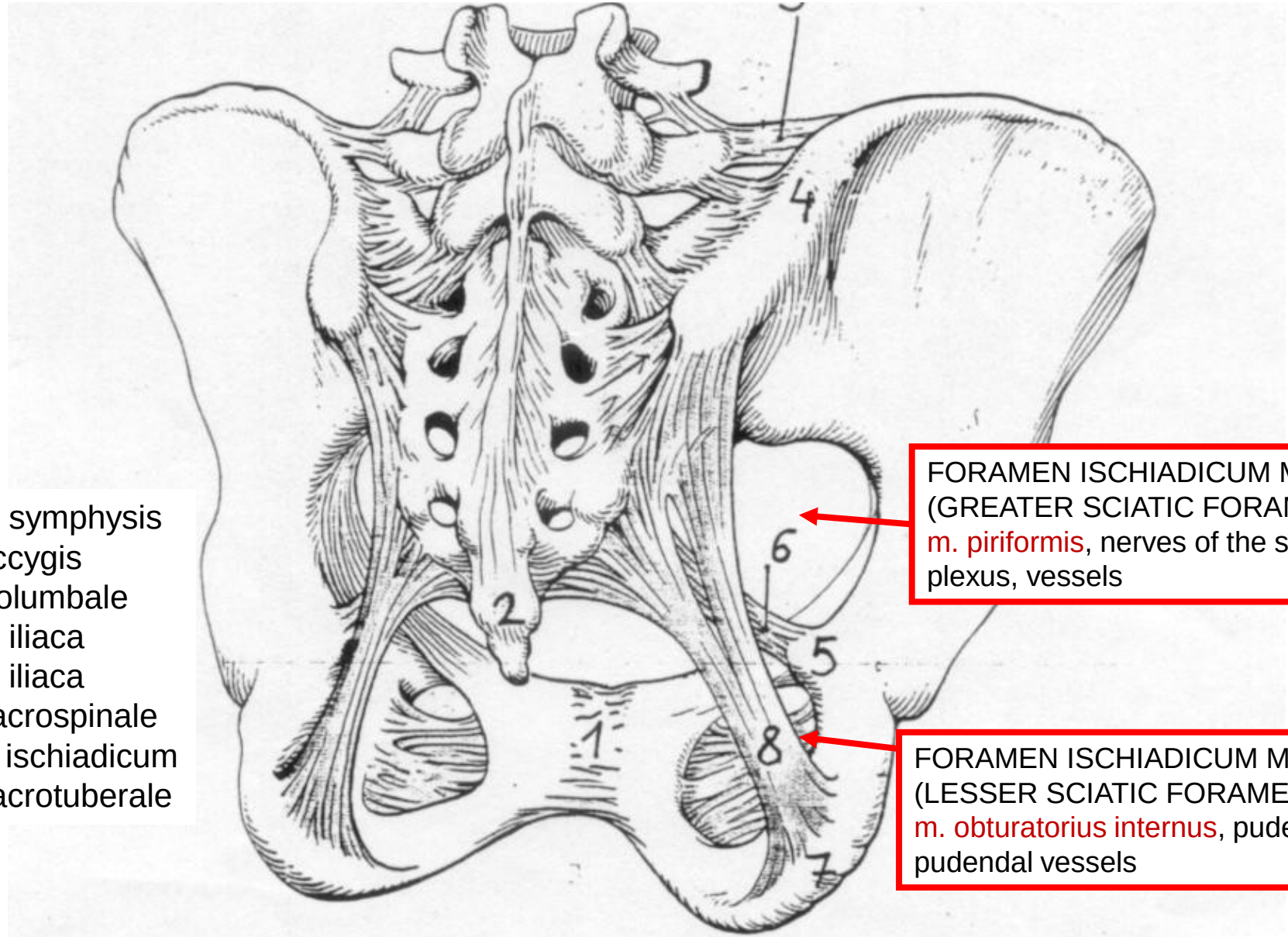



GREATER SCIATIC FORAMEN
SUPRAPIRIFORM FORAMEN
INFRAPIRIFORM FORAMEN
LACUNA MUSCULORUM (MUSCULAR SPACE)
LACUNA VASORUM (VASCULAR SPACE)
OBTURATOR CANAL
LESSER SCIATIC FORAMEN
5
6
7
10

Pelvis – ligaments
Posterior aspect



1- pubic symphysis
2-os coccygis
3- lig. iliolumbale
4- crista iliaca
5- spina iliaca
6- lig. sacrospinale
7- tuber ischiadicum
8- lig. sacrotuberale

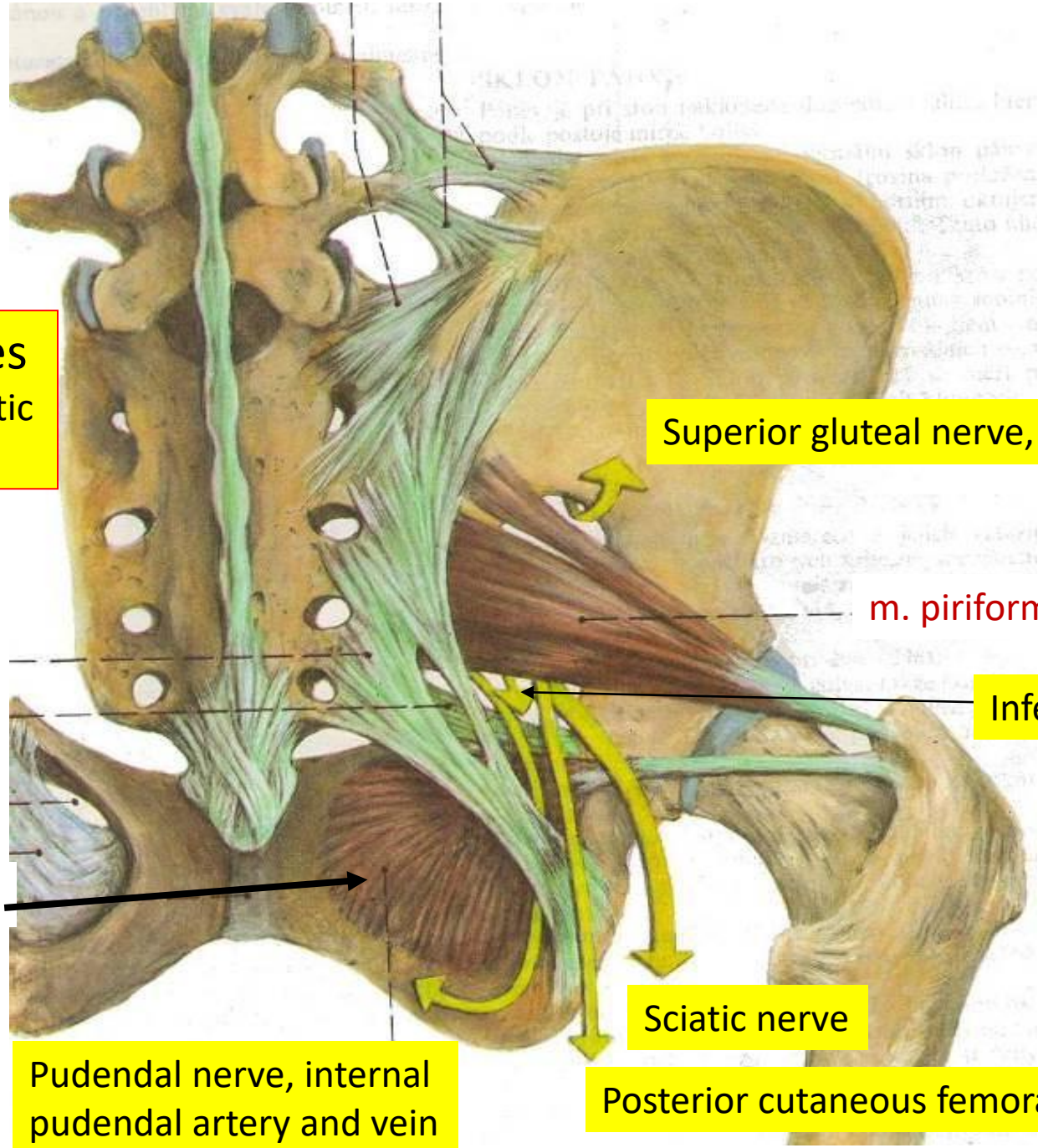


FORAMEN ISCHIADICUM MAJUS
(GREATER SCIATIC FORAMEN):
m. piriformis, nerves of the sacral plexus, vessels

FORAMEN ISCHIADICUM MINUS
(LESSER SCIATIC FORAMEN)
m. obturatorius internus, pudendal nerve, internal pudendal vessels

Sacral plexus nerves

in greater and lesser sciatic foramen



Superior gluteal nerve, art. + vein

m. piriformis

Inferior gluteal nerve, art. + vein

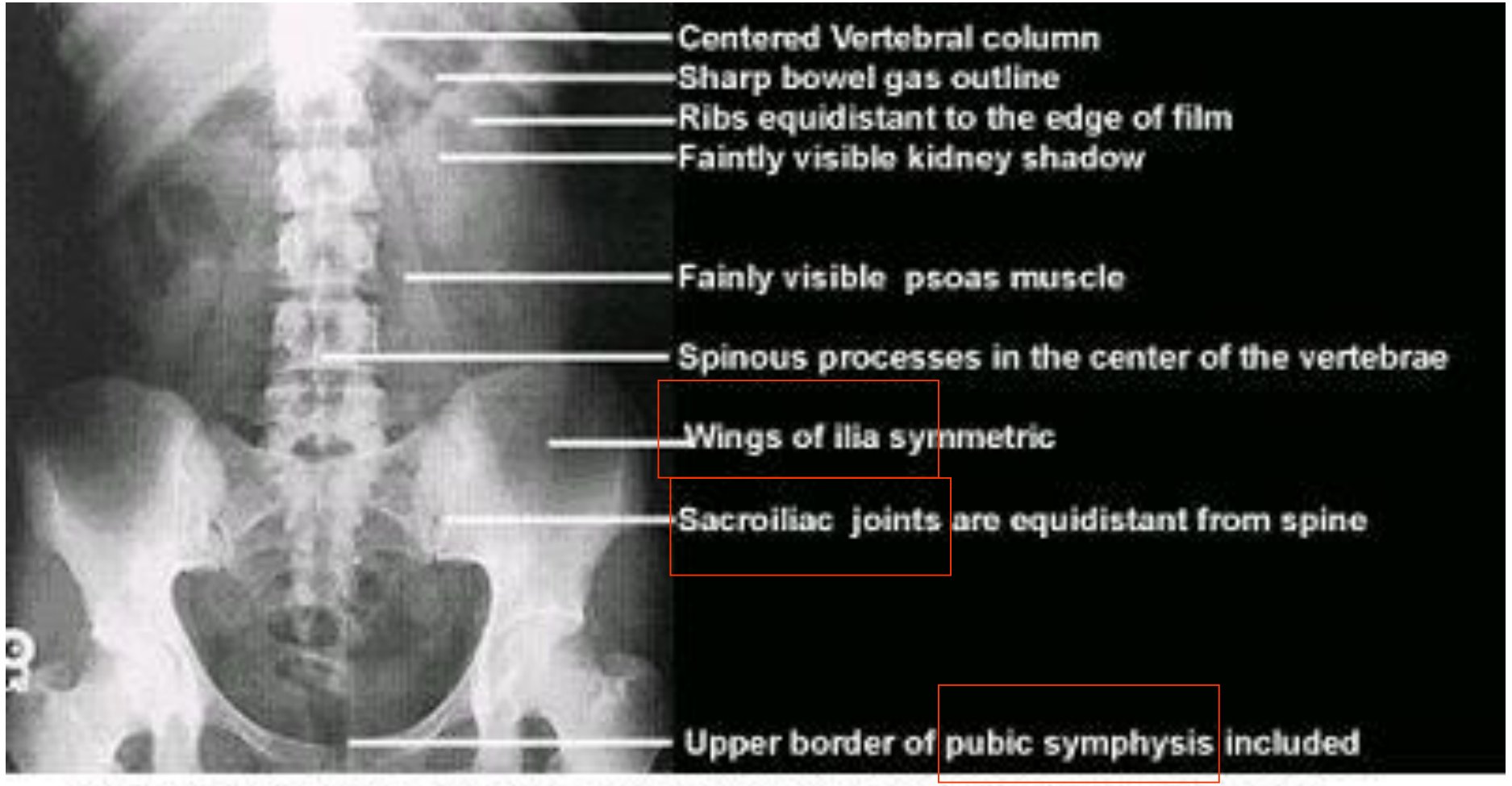
m. obturatorius internus

Sciatic nerve

Pudendal nerve, internal pudendal artery and vein

Posterior cutaneous femoral nerve

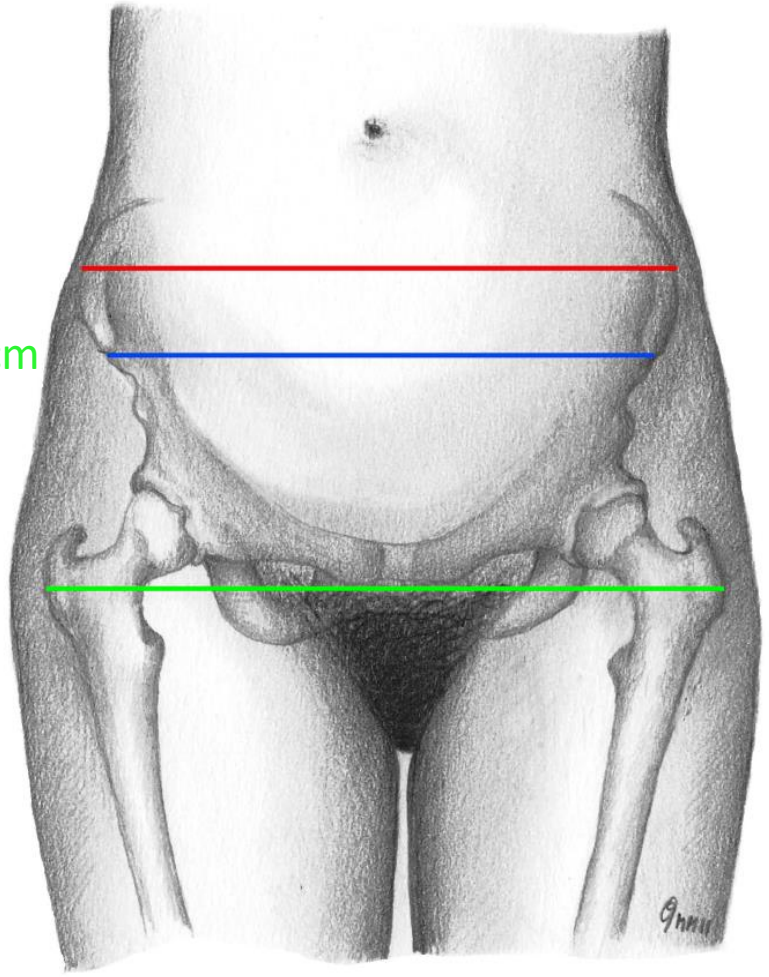
x-ray

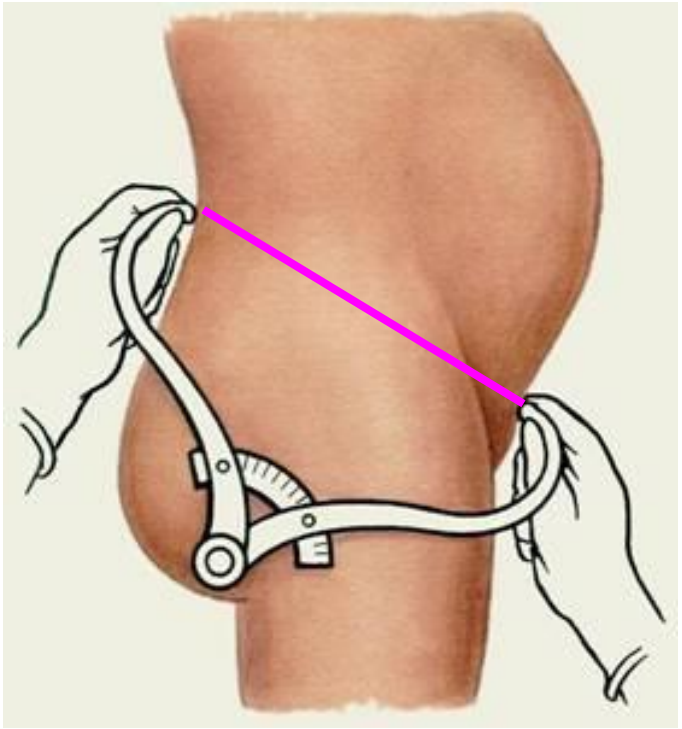


AP abdominal image showing important evaluation criteria. Image courtesy of Dr. Naveed Ahmad.

External pelvic diameters

Interspinous distance – 26 cm
Intercristal distance – 29 cm
Intertrochanteric distance -31cm



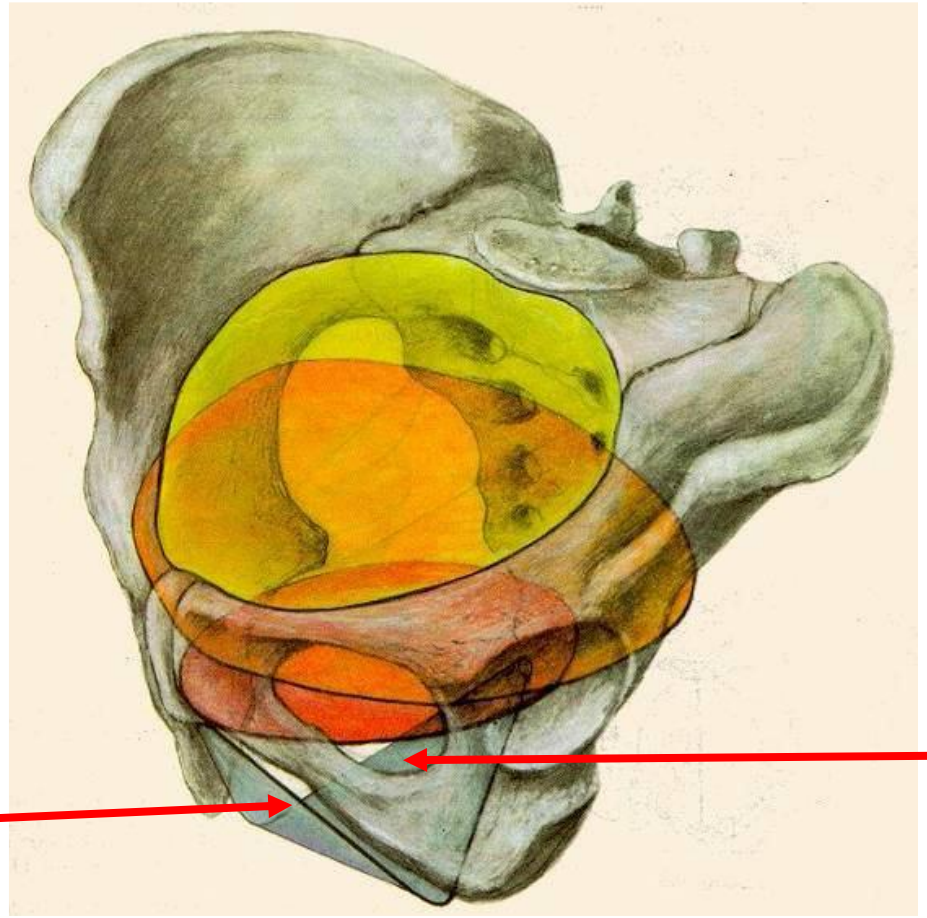


External conjugate - 18 cm
L5 – Pubic symphysis superior border

Pelvis minor

Pelvic planes:

1) Pelvic inlet
2) Pelvic width
3) Pelvic narrow
4) Pelvic outlet



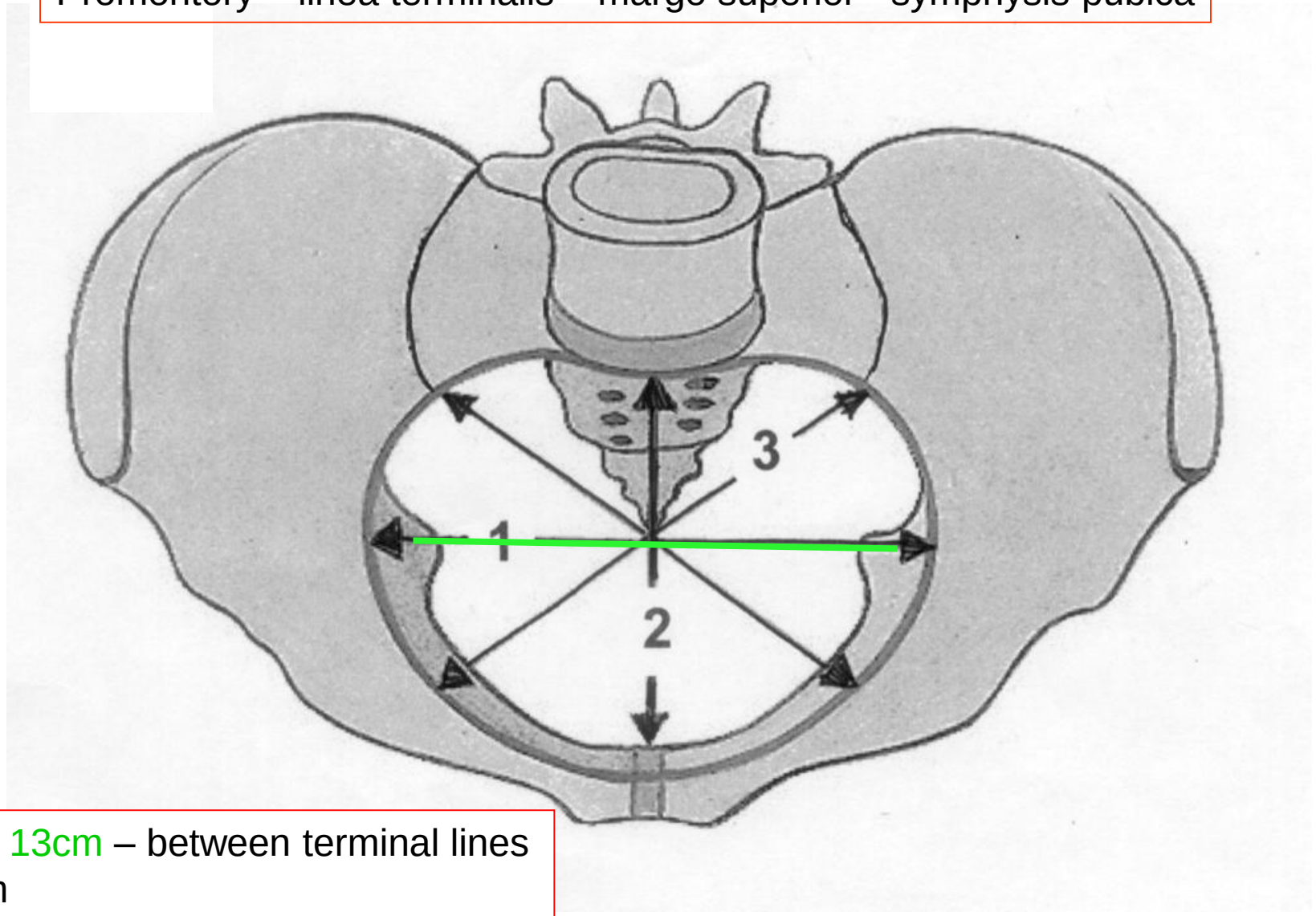
Urogenital triangle

Anal triangle

Pelvic planes

1) Pelvic inlet – Aditus pelvis

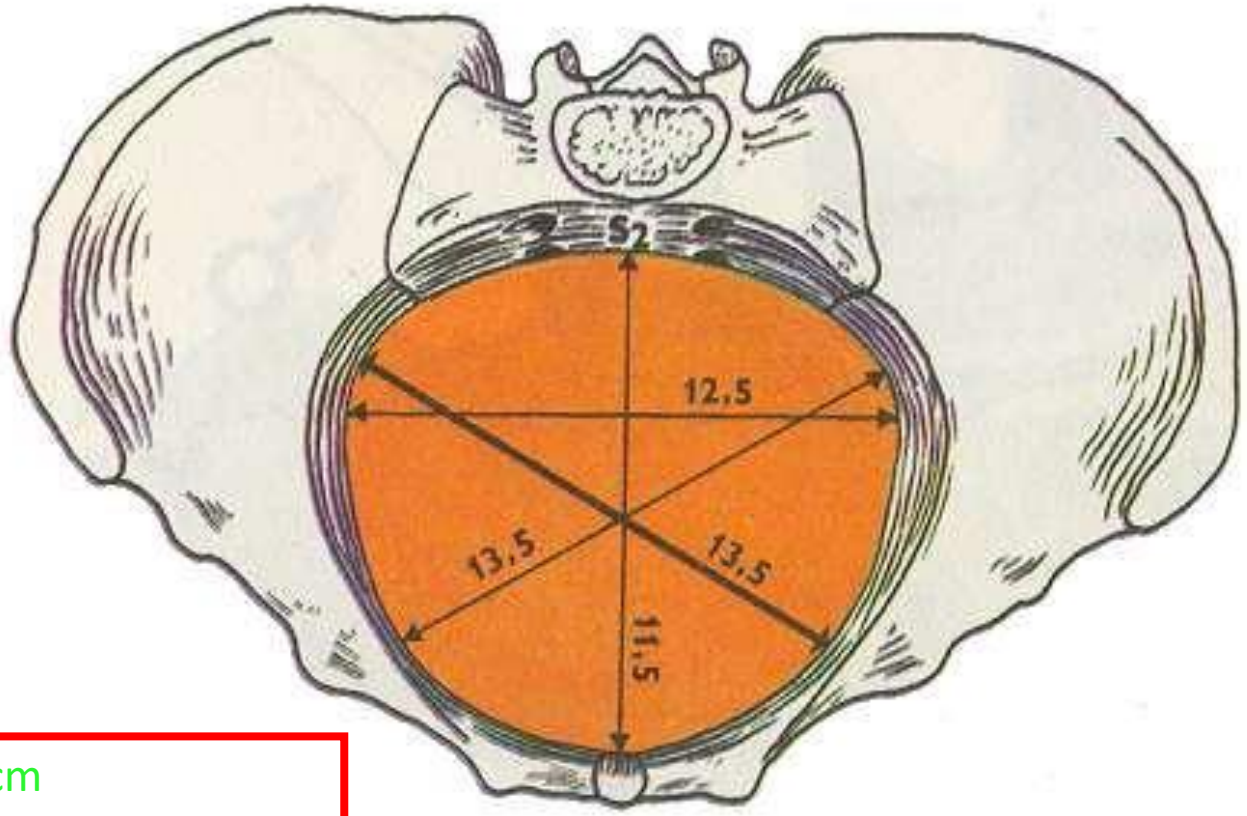
Promontory – linea terminalis – margo superior - symphysis pubica



1- diameter transversa 13cm – between terminal lines
2-diameter recta -11cm
3- diameter obliqua 12cm

2) Pelvic width - amplitudo pelvis

middle part of sacrum, symphysis and acetabulum



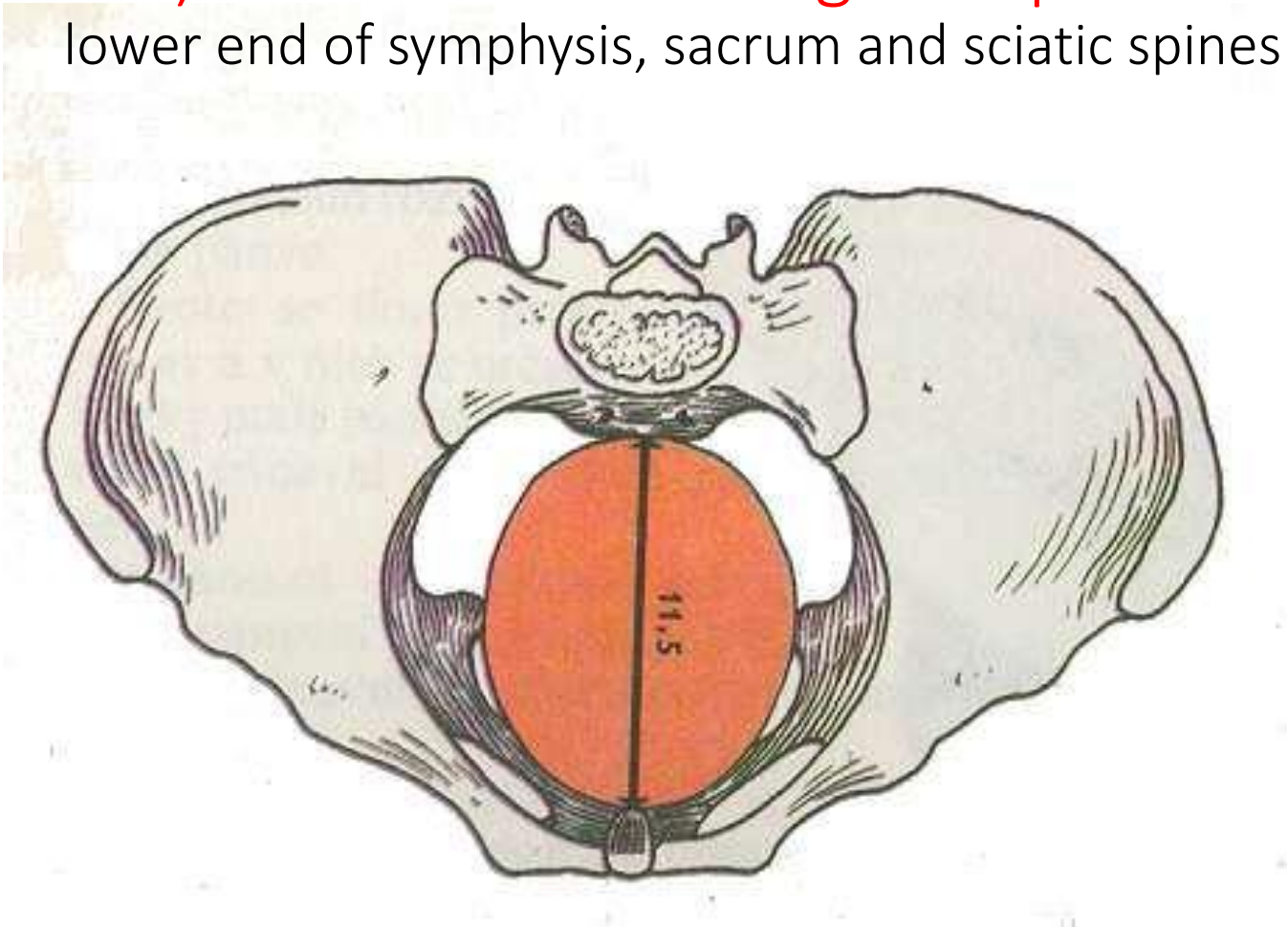
AMPLITUDO

Oblique diameter 13,5 cm

Obturatory groove- greater sciatic notch

3) Pelvic narrow – angustia pelvis

lower end of symphysis, sacrum and sciatic spines

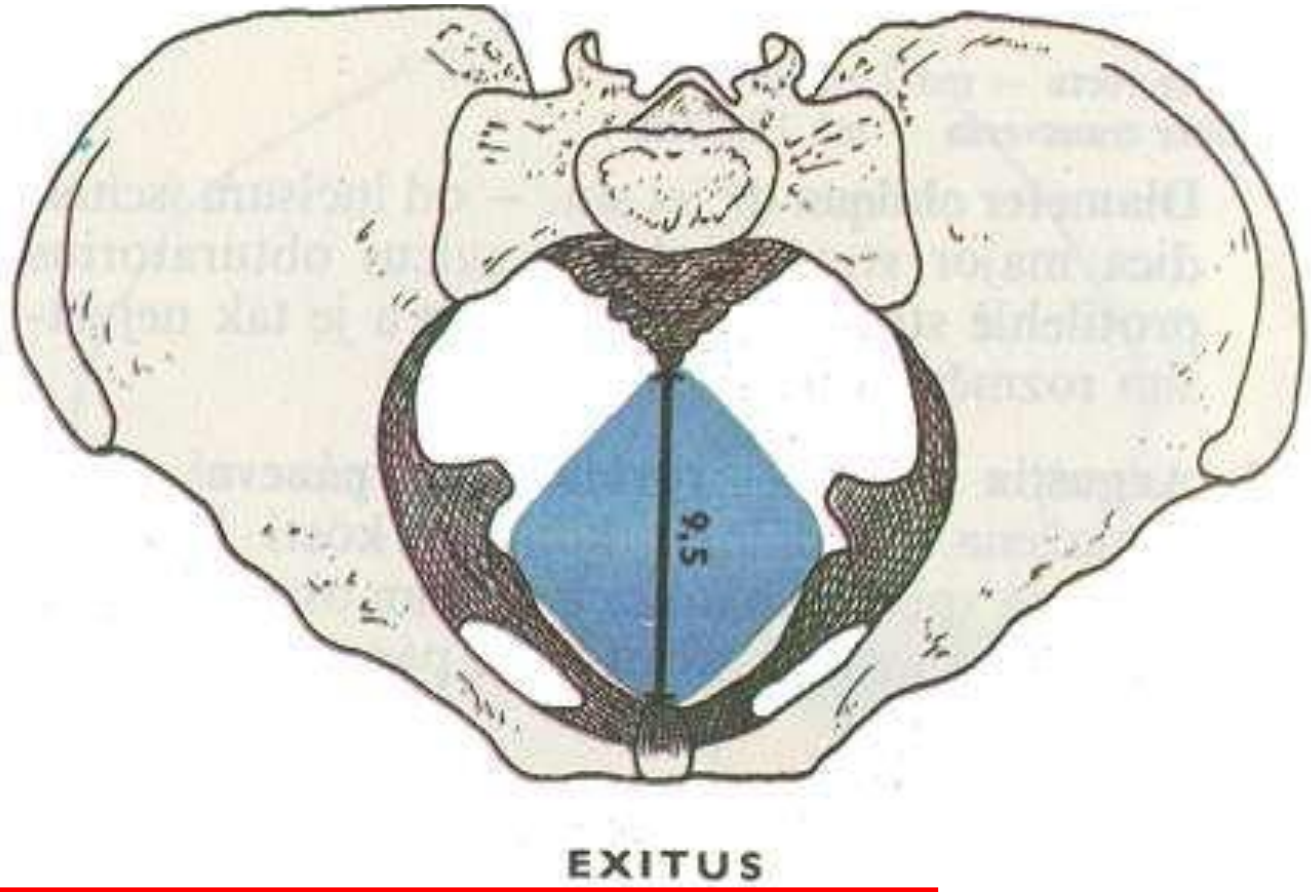


Straight diameter 11,5 cm

lower end of symphysis and lower end of sacrum

4) Pelvic outlet – exitus pelvis

lower end of symphysis and coccygis and sciatic tuberosities

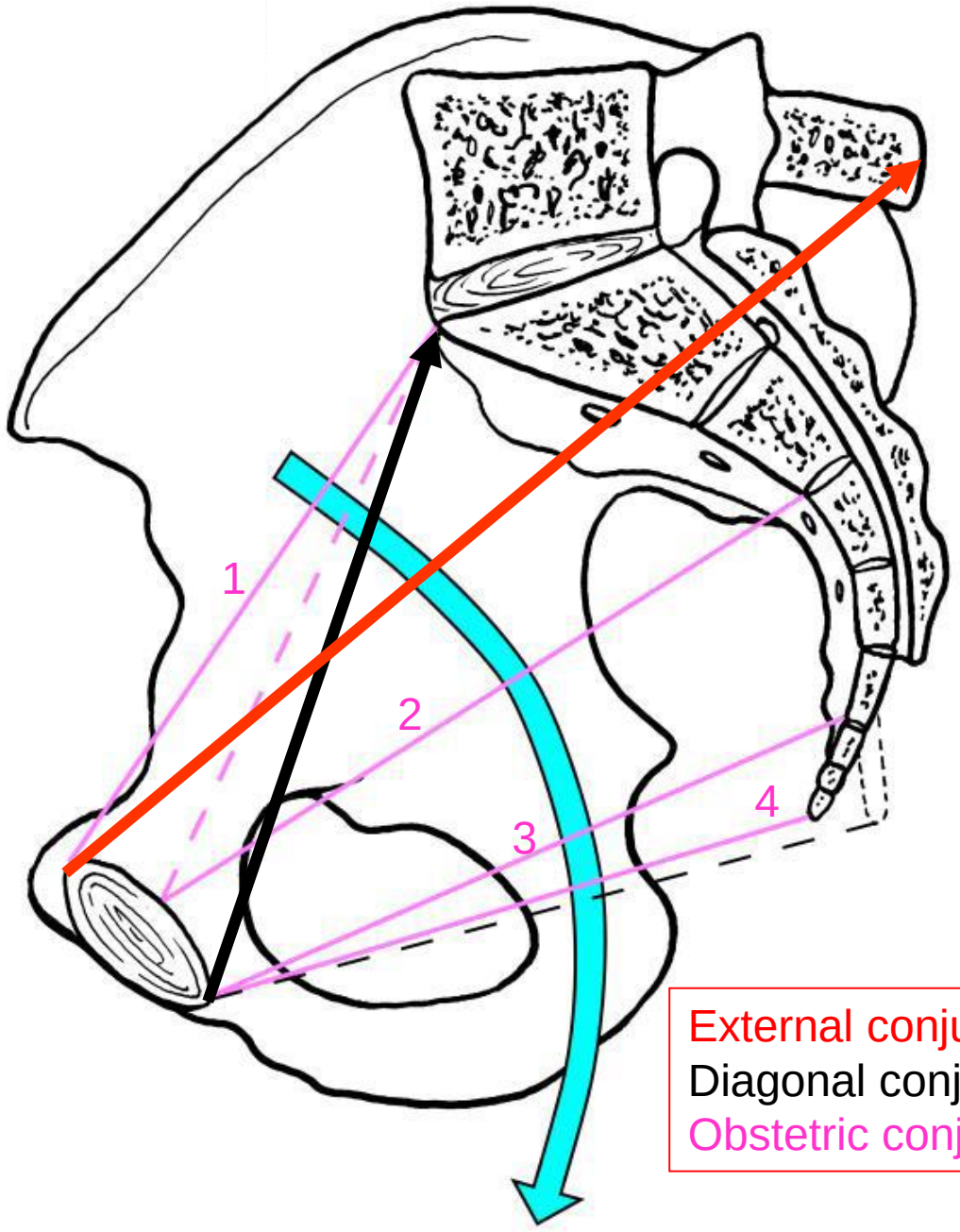


Straight diameter 9,5 cm (coccygis can move posteriorly so 11,5 cm)
lower end of symphysis and lower end of sacrum

Pelvic diameters

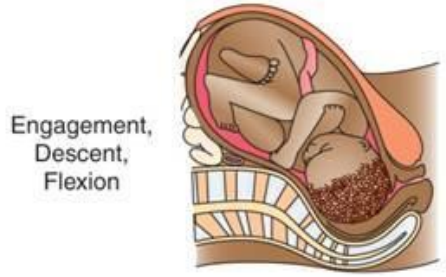
Pelvic planes:

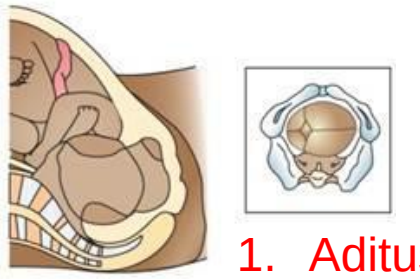
1) Pelvic inlet
2) Pelvic width
3) Pelvic narrow
4) Pelvic outlet



External conjugate 18-20cm
Diagonal conjugate 13cm
Obstetric conjugate 10,5cm

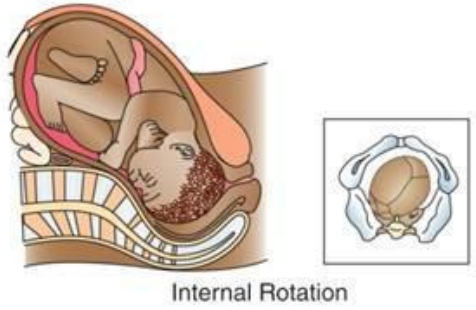
Head of newborn in pelvic planes

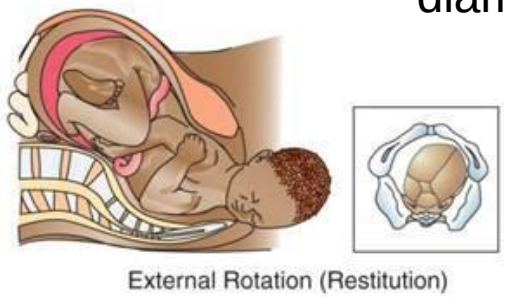




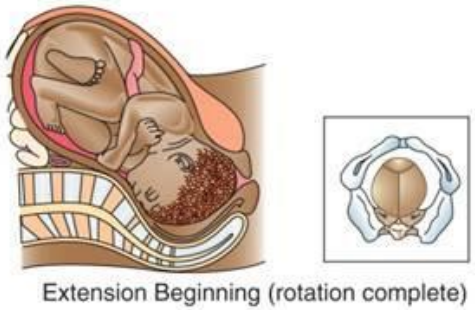
1. Aditus pelvis (transverse diameter 13 cm)

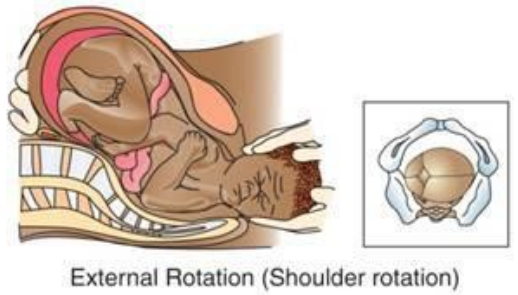
2. Amplitudo pelvis (oblique diameter, 13,5cm)



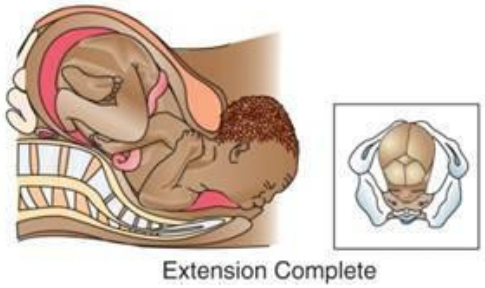


3. Angustia pelvis (straight diameter 11,5cm)



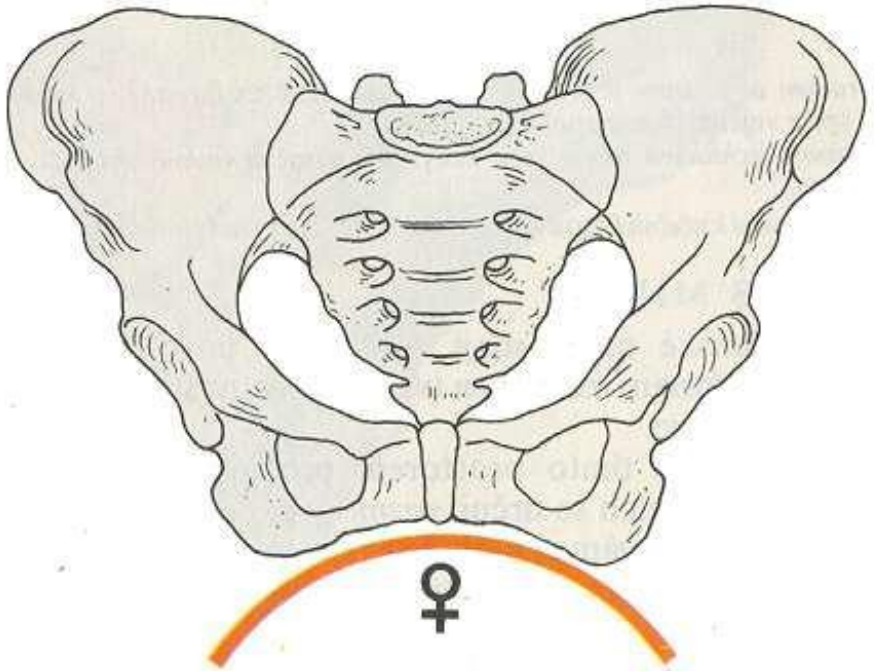


4. Exitus pelvis (straight diameter 9,5 -11,5cm)

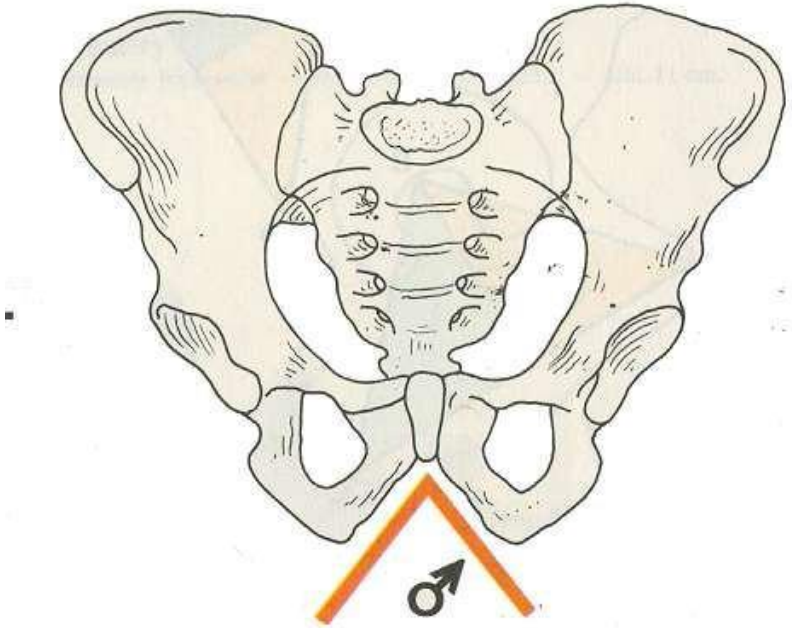


Sex differencies in pelvis shape

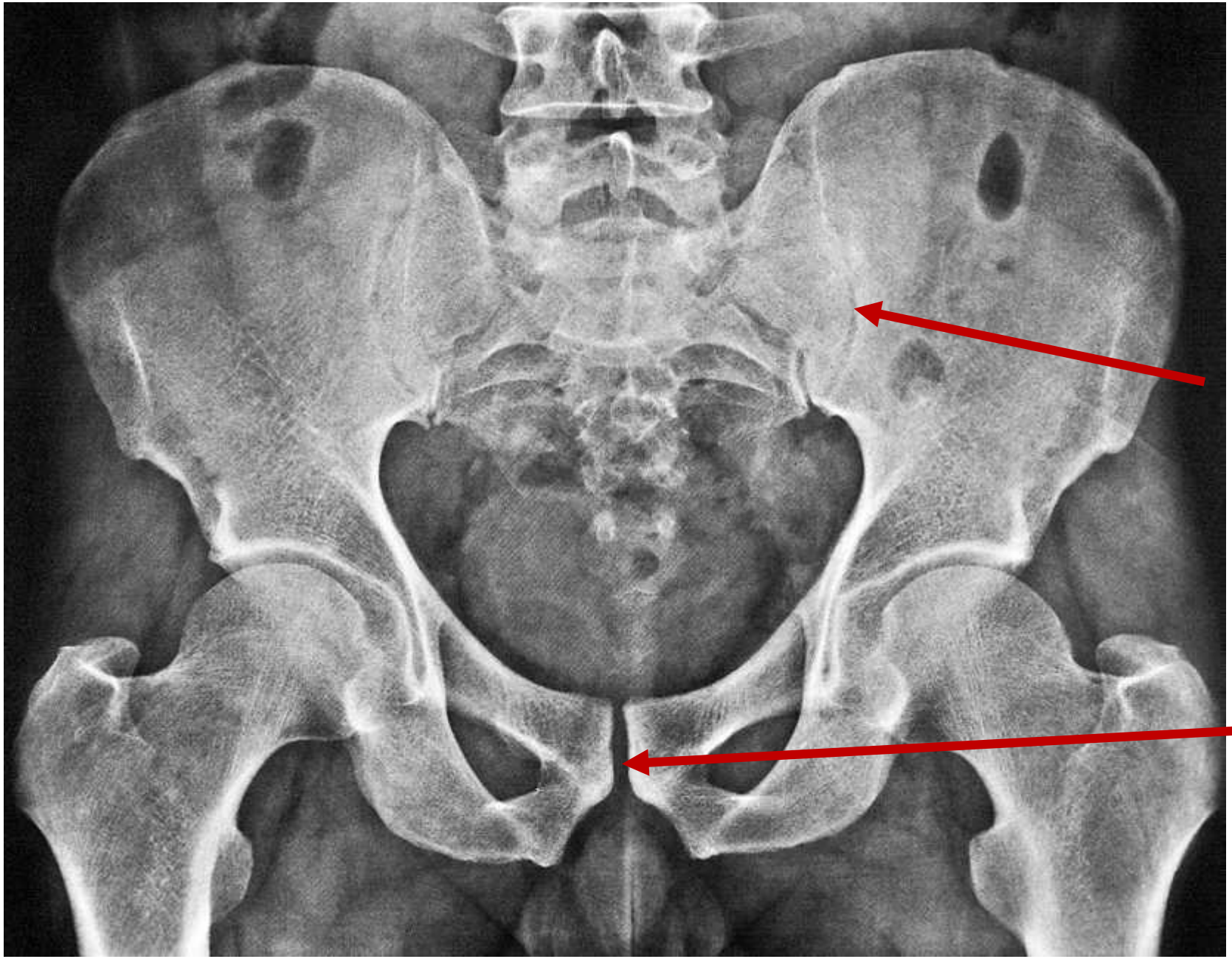
- **1 The pelvic inlet is oval** in the female. In the male the sacral promontory is prominent, producing a heart-shaped inlet.
- **2 The pelvic outlet is wider** in females as the ischial tuberosities are everted.
- **3 The pelvic cavity is more spacious** in the female than in the male.
- **4** The **false pelvis is shallow** in the female.
- **5** The **pubic arch** (the angle between the inferior pubic rami) is wider and more rounded in the female when compared with that of the male.

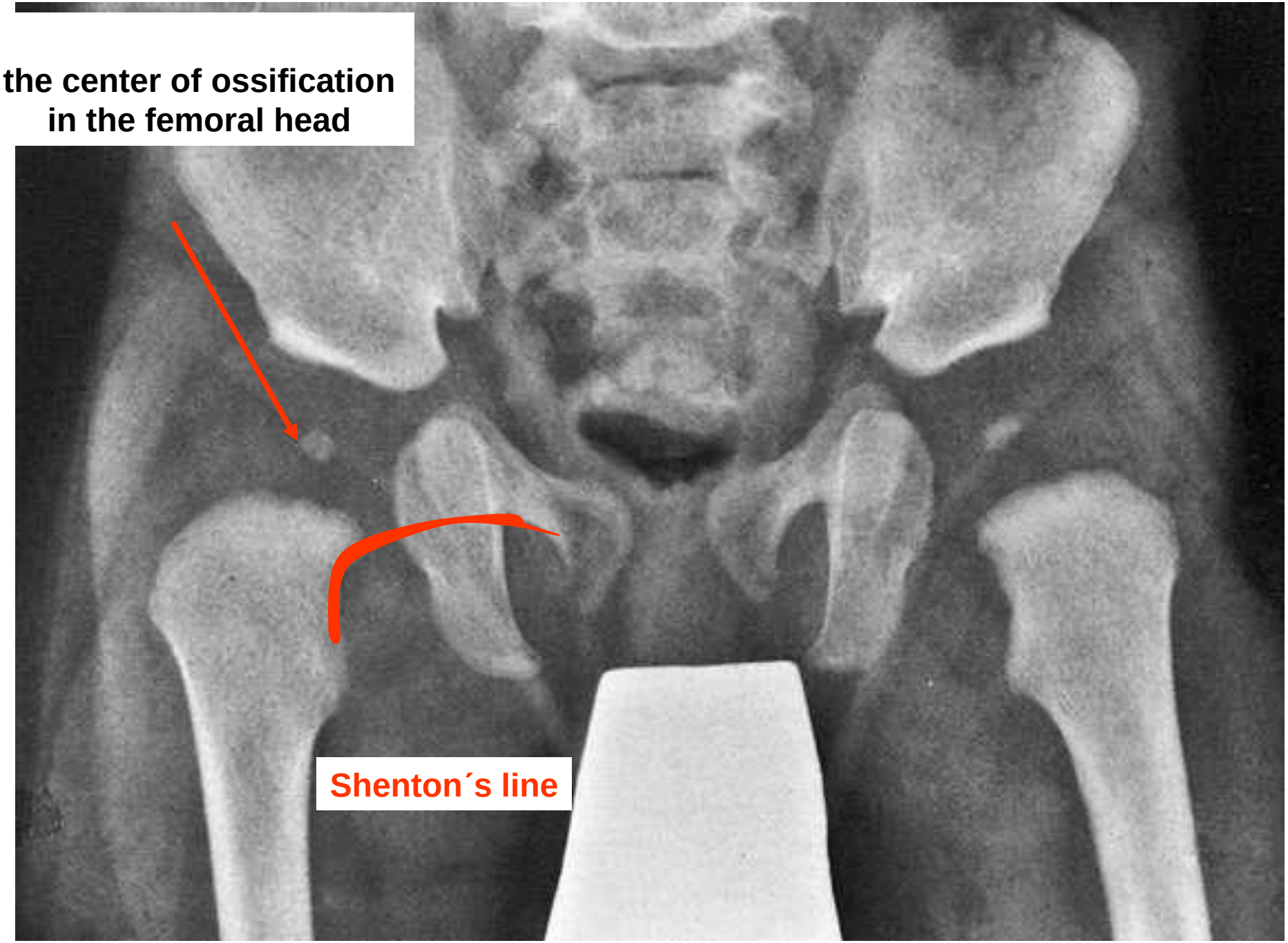


Pubic arch



Pubic angle

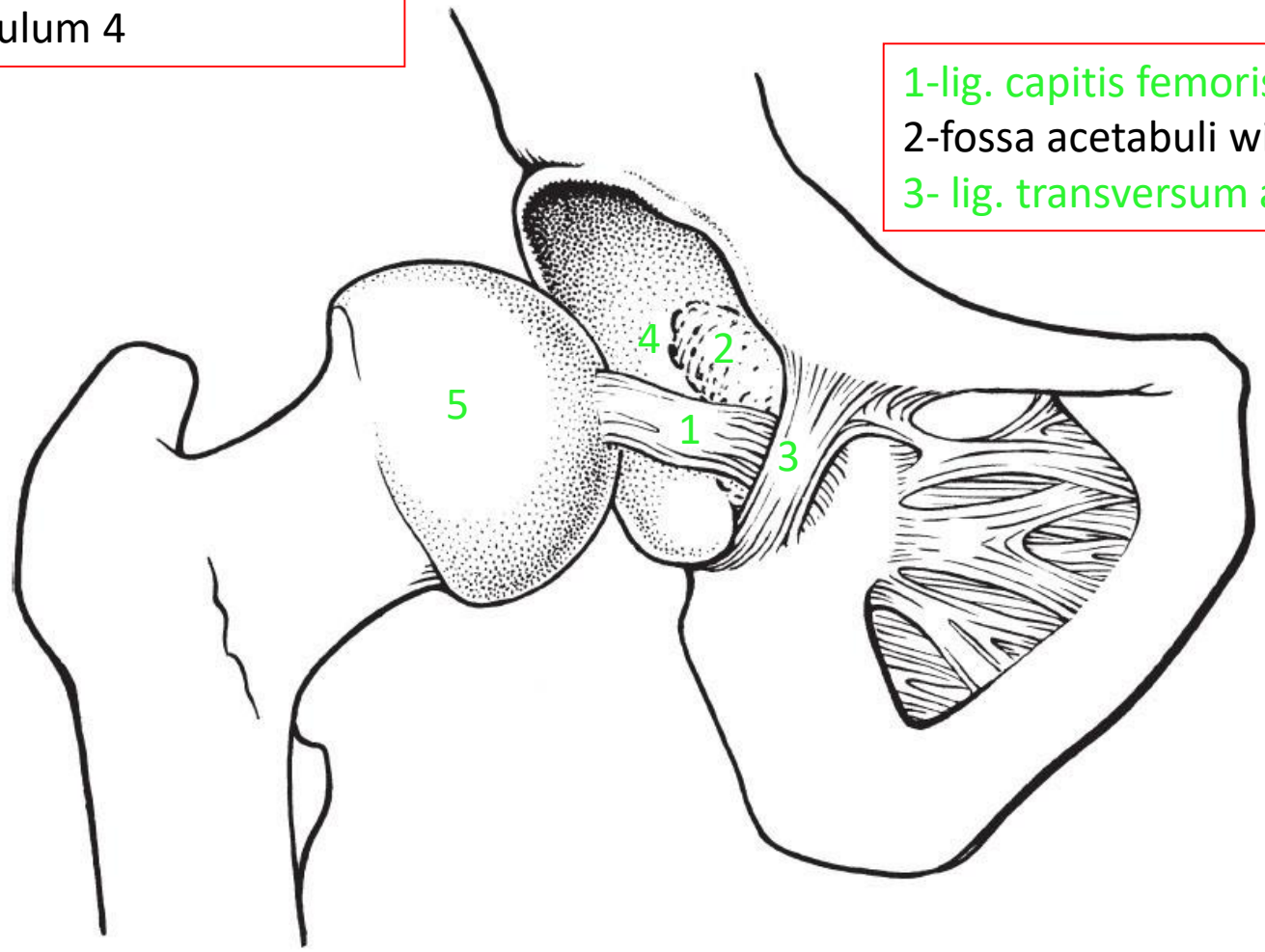



the center of ossification
in the femoral head
Shenton´s line

Hip joint

articulatio coxae

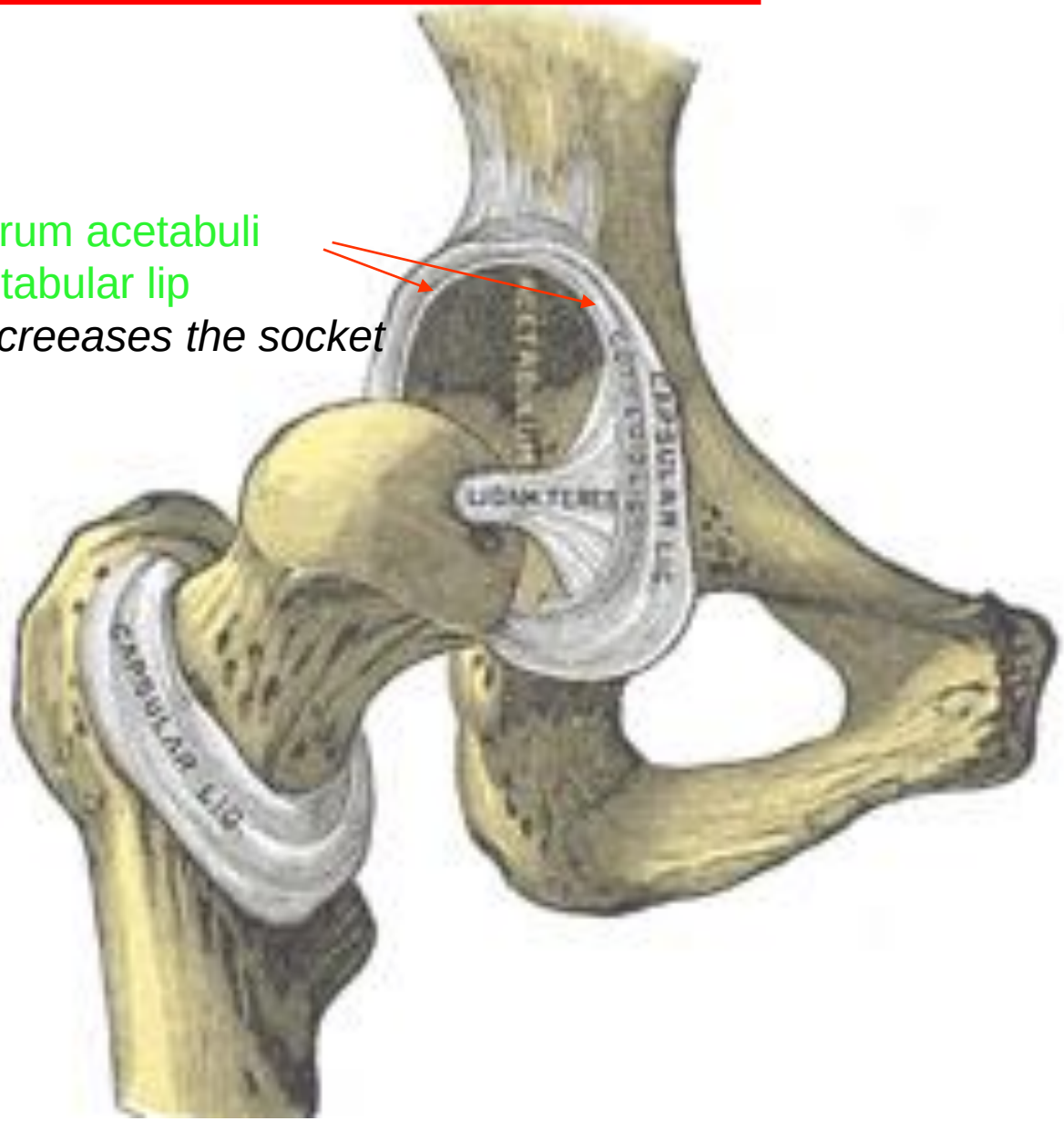
Ball and socket joint
(enarthrosis) 2/3 of the head is in the socket
Head of femur 5
Lunate surface of acetabulum 4



1-lig. capitis femoris
2-fossa acetabuli with fat pad (pulvinar acetabuli)
3- lig. transversum acetabuli

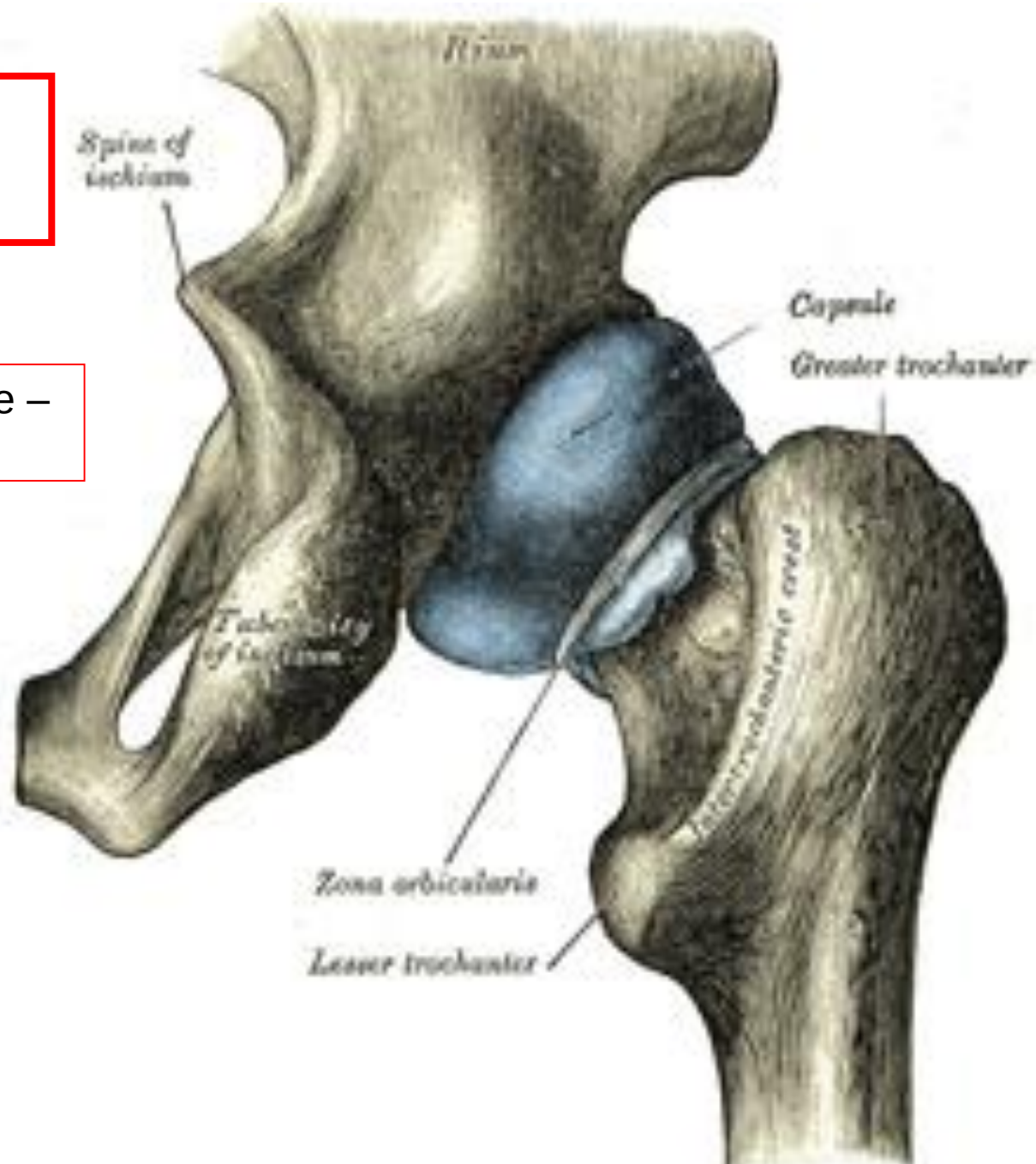
Joint capsule is attached outside to the acetabular lip on the pelvis and to the intertrochanteric line on the femur

Labrum acetabuli
Acetabular lip
It increeases the socket

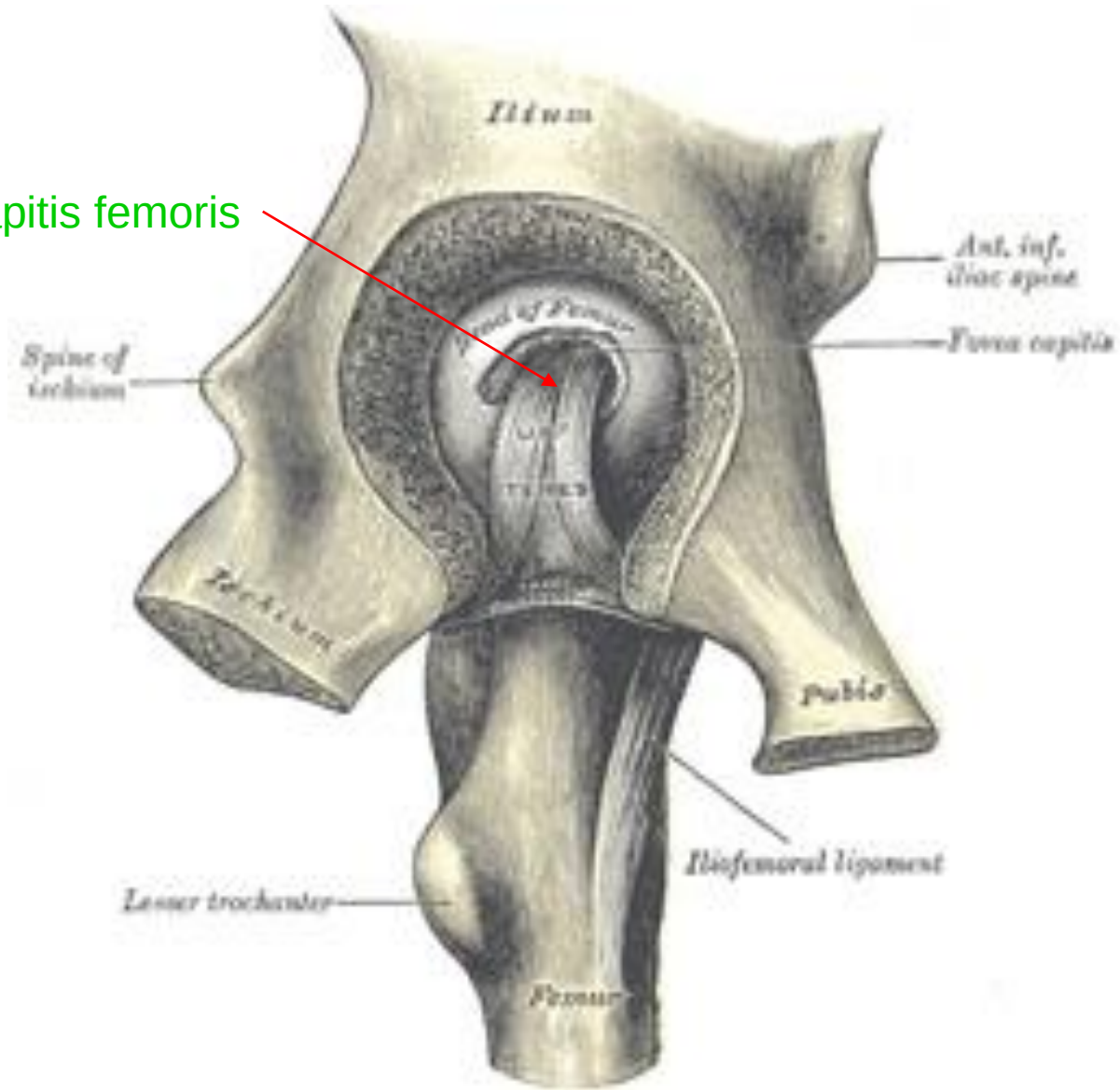


Posteriorly joint capsule is attached to the neck of the femur

Trochanters outside the joint capsule – for muscles attachment



Lig. capitis femoris



Ligaments:

1 Iliofemoral

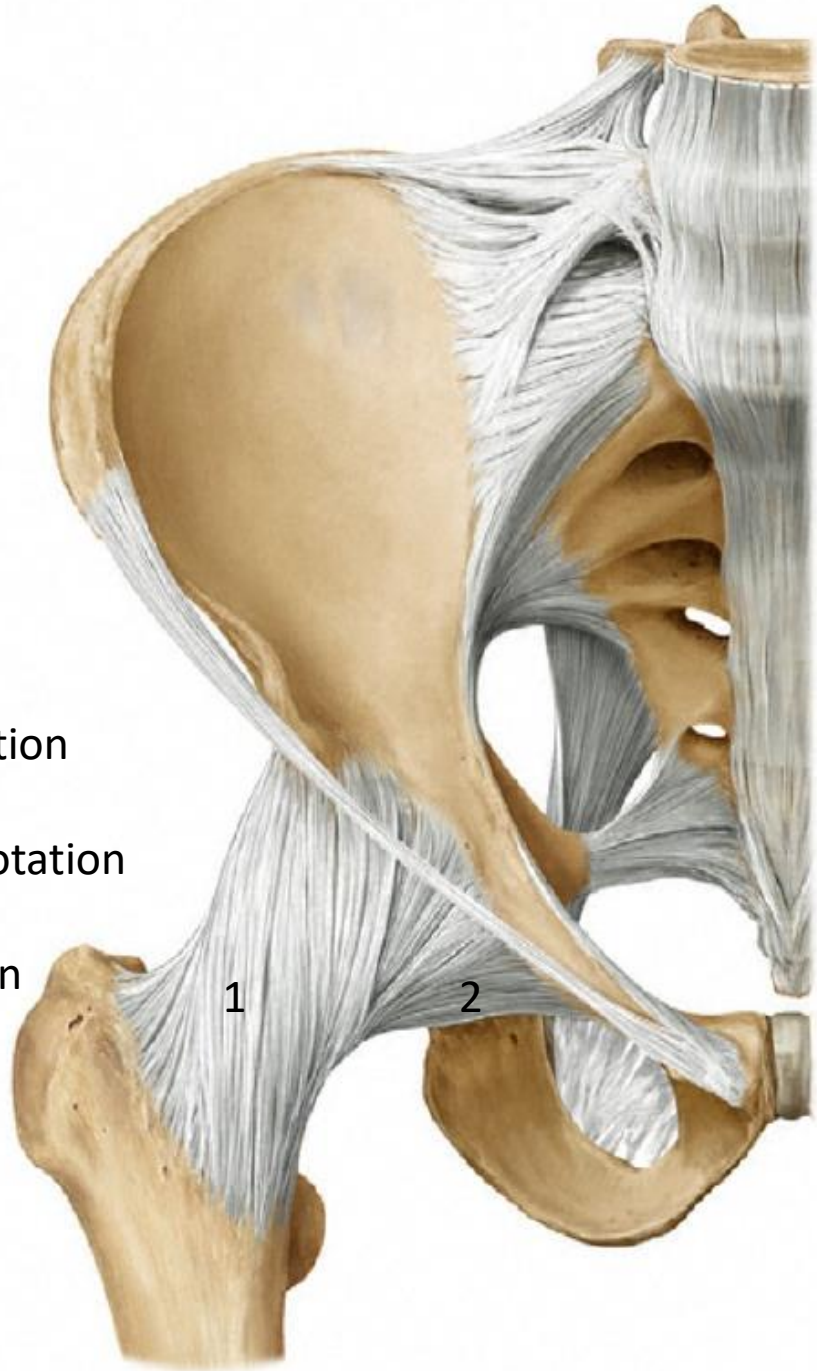
– it prevents dorsiflection

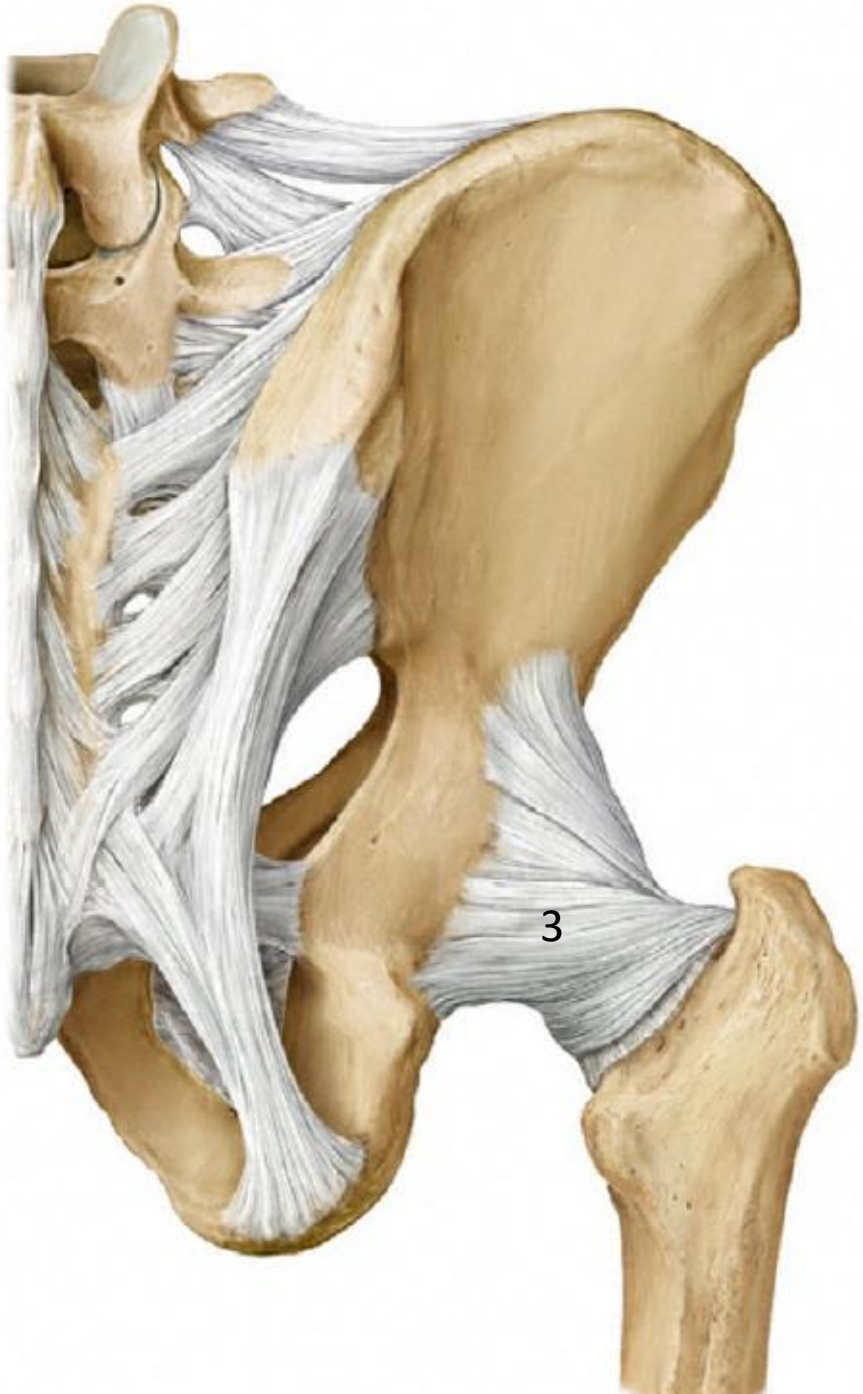
2 Pubofemoral

– it prevents medial rotation

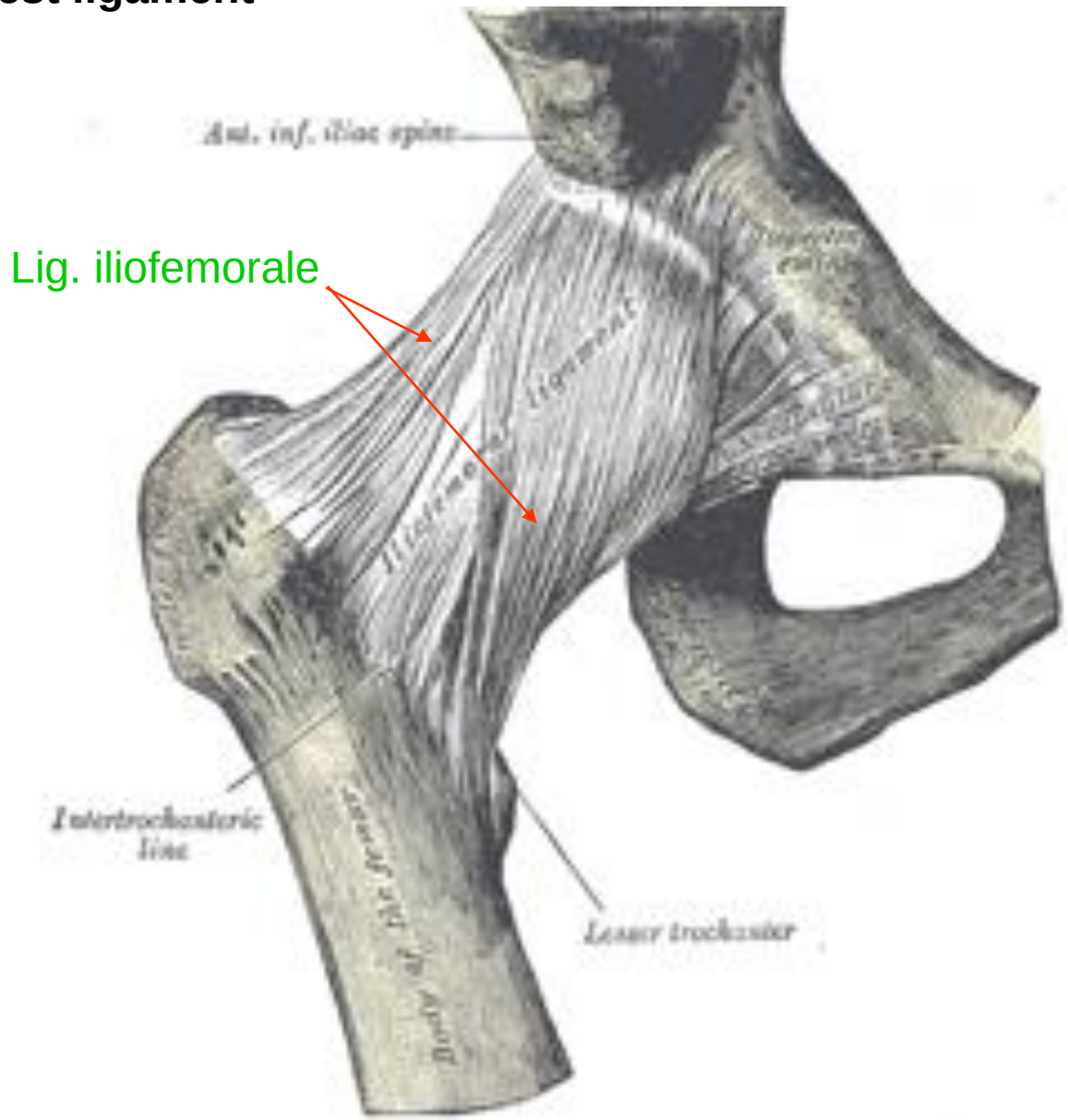
3 Ischiofemoral

–it prevents abduction

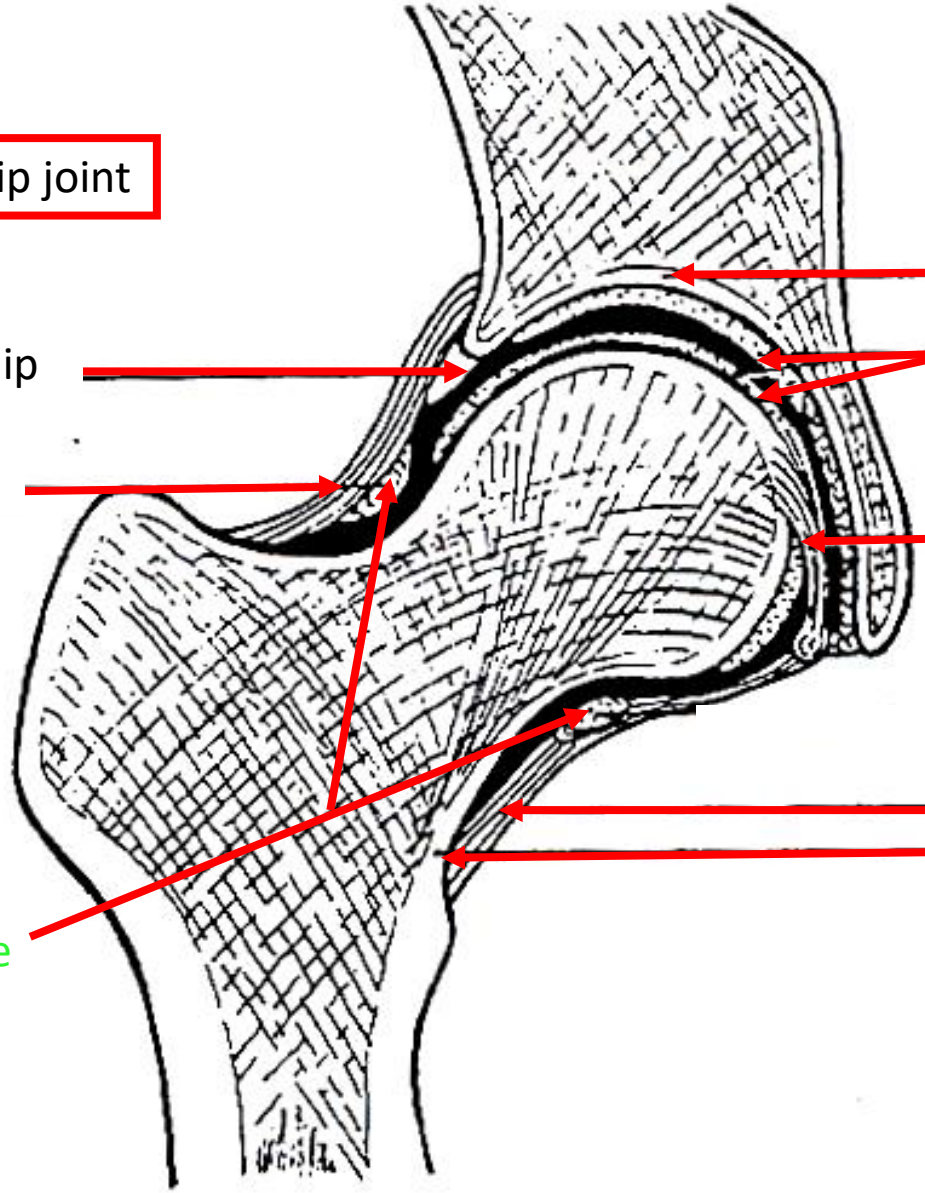




Our strongest ligament



Frontal section of the hip joint



Lunate surface of acetabulum

Joint cartilage

Acetabular lip

Joint capsule

Lig. capitis femoris

Joint capsule

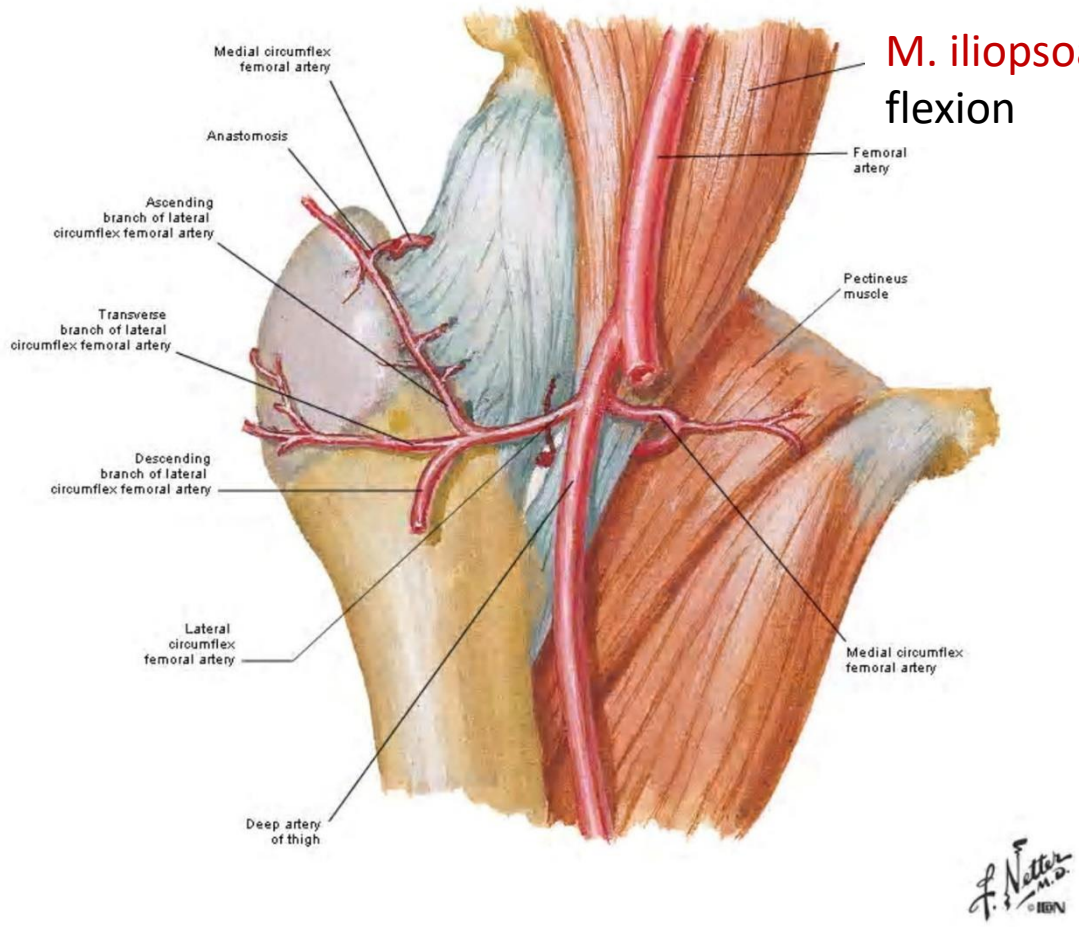
Adams´arch
- thick medial cortex of the femoral neck

Orbicular zone

Plate 486D

Arteries of Femoral Head and Neck

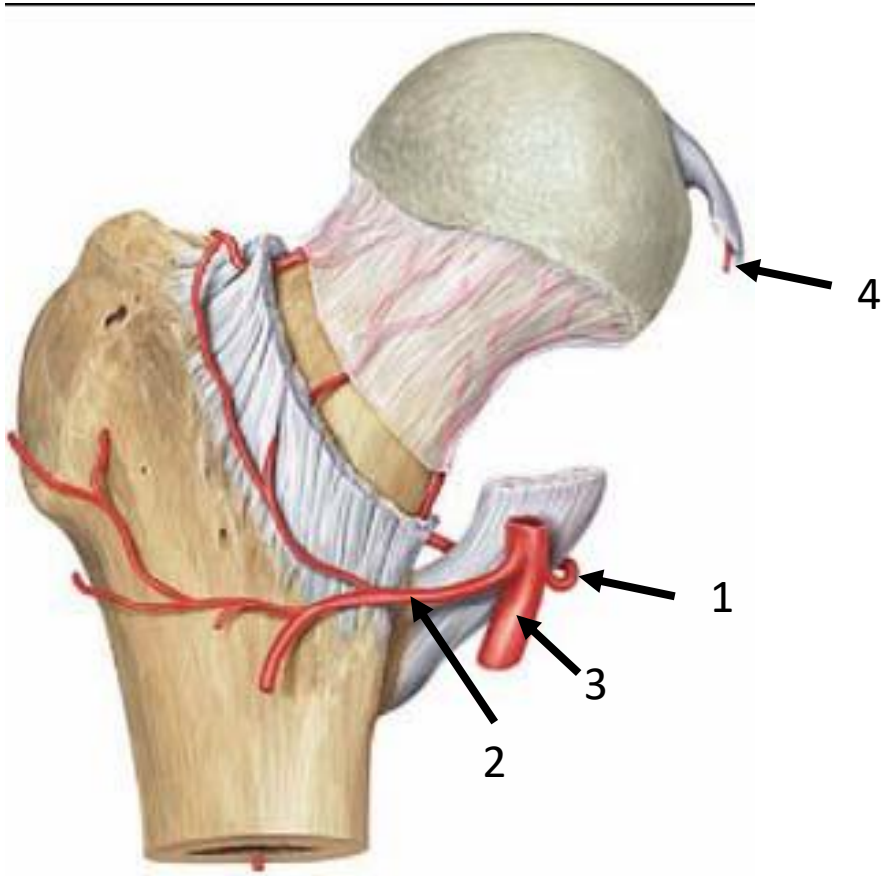
Anterior View In Situ



M. iliopsoas in front of the hip joint flexion

Blood supplying of the hip joint:

medial (1) and lateral (2) circumflex femoral artery from the deep femoral artery (3)

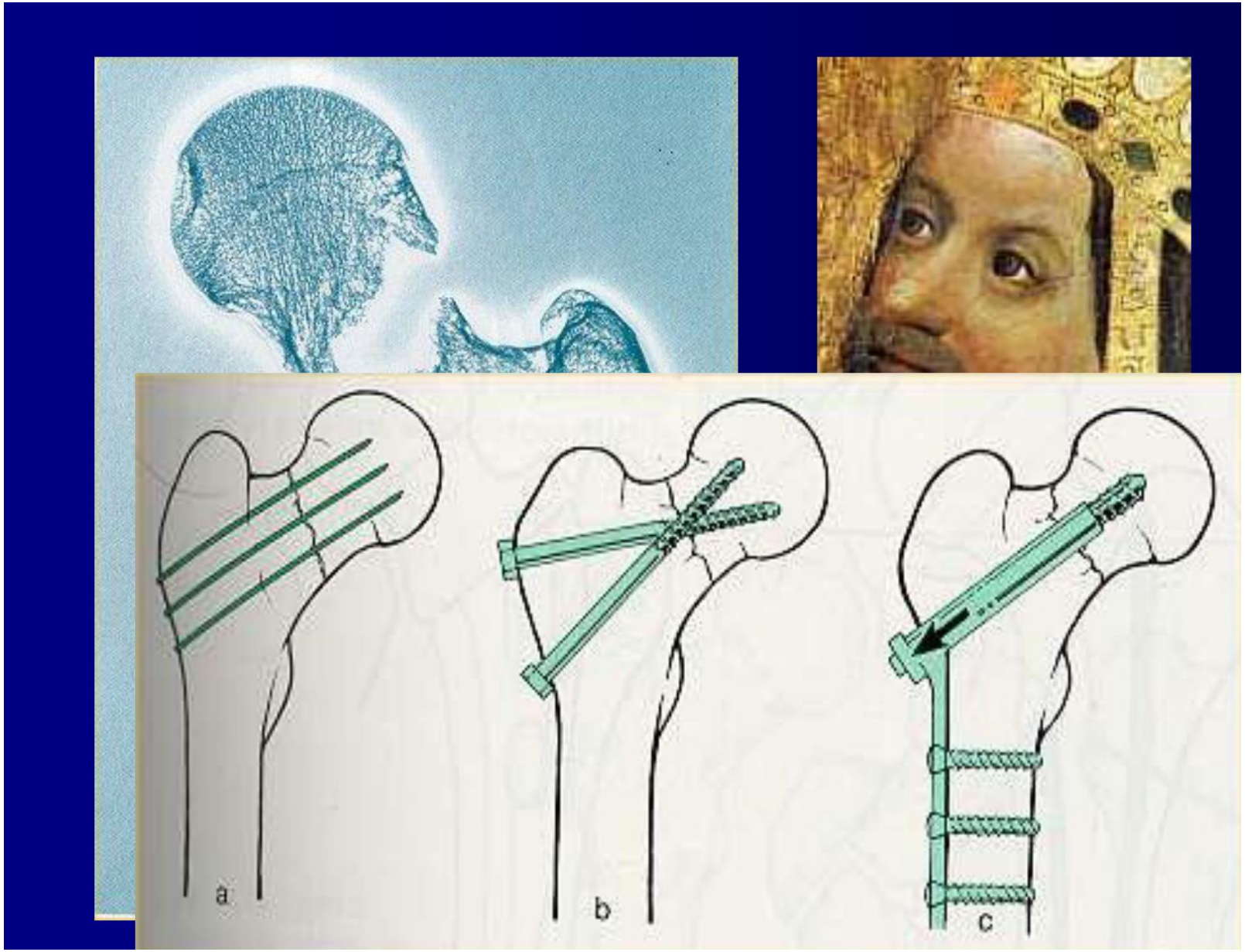


a. capitis femoris (4) from the acetabular branch is a functionally unimportant artery inside the lig. capitis femoris

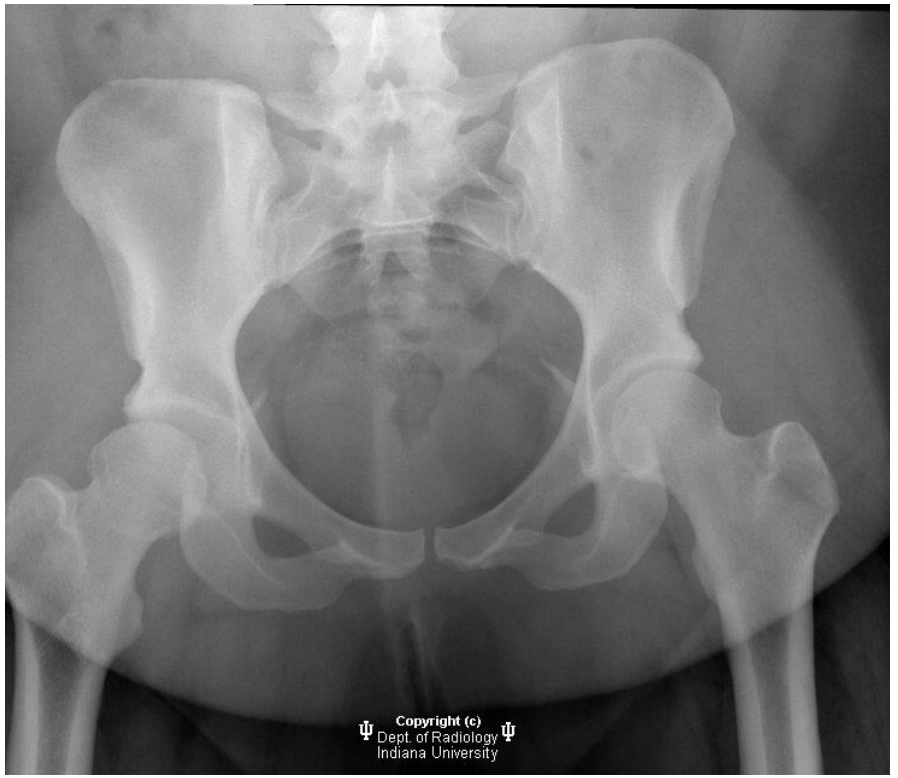
Movements of the hip joint

- Flexion 140
- Extension 15
- Abduction 45
- Adduction 30
- Internal rotation
- External rotation
- Circumduction

Fracture of the collum femoris – typical osteoporotic fracture

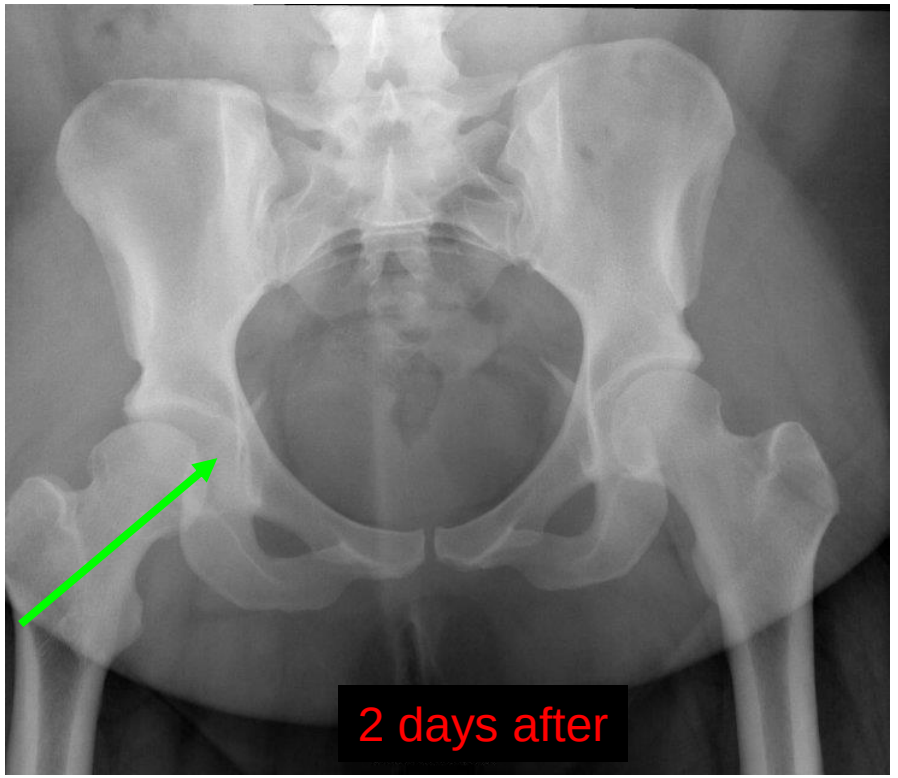


The patient has a normal white count with no fever. No incidental trauma. What then might be a cause of the new abnormality with the R hip joint?



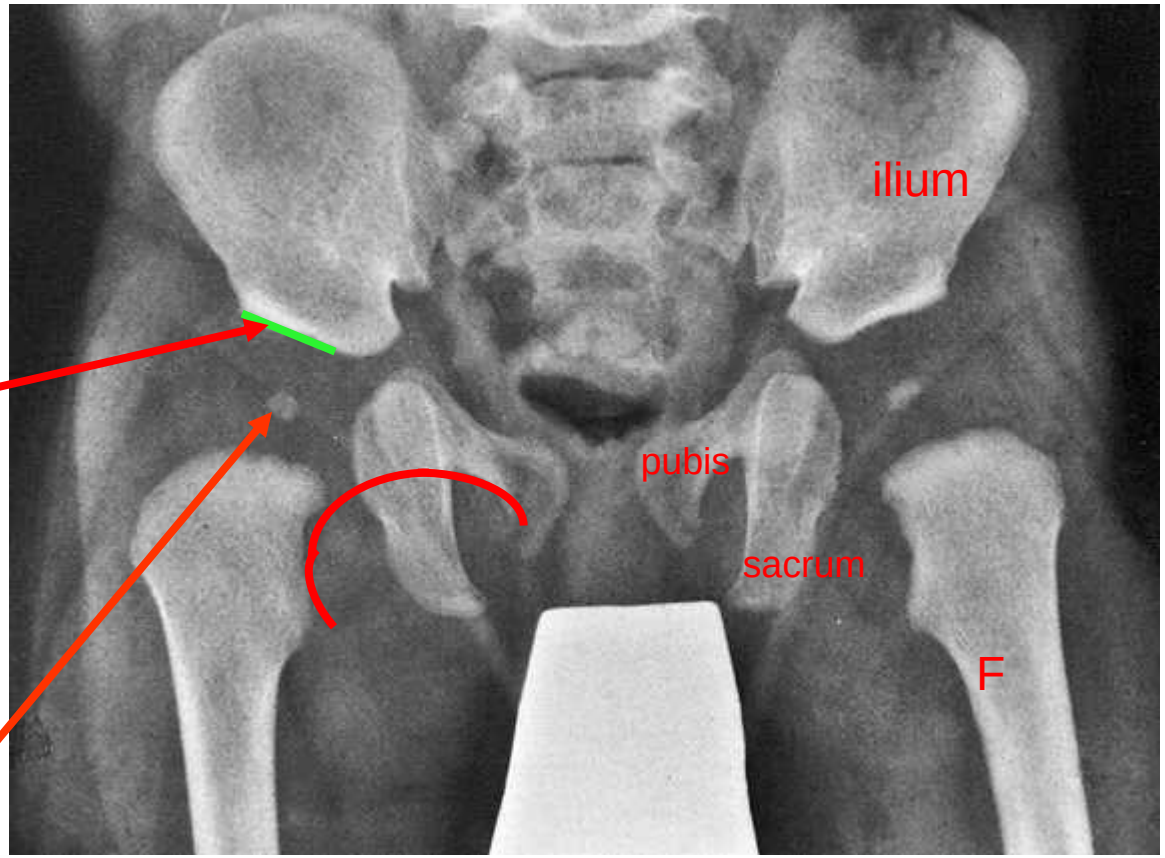
2 days after

Initial pelvis image is unremarkable aside from calcified sacrospinous ligaments. Views of the pelvis and right hip 2 days later show no fracture or dislocation. However the right hip shows an **enlarged joint space.**



- **The key event: The patient had a hip arthrogram shortly after the first radiograph**
- Sterile chemical synovitis

Shenton´s line – smootch line between the lower side of femoral neck and upper part of obturatory foramen
It means: good position in hip joint

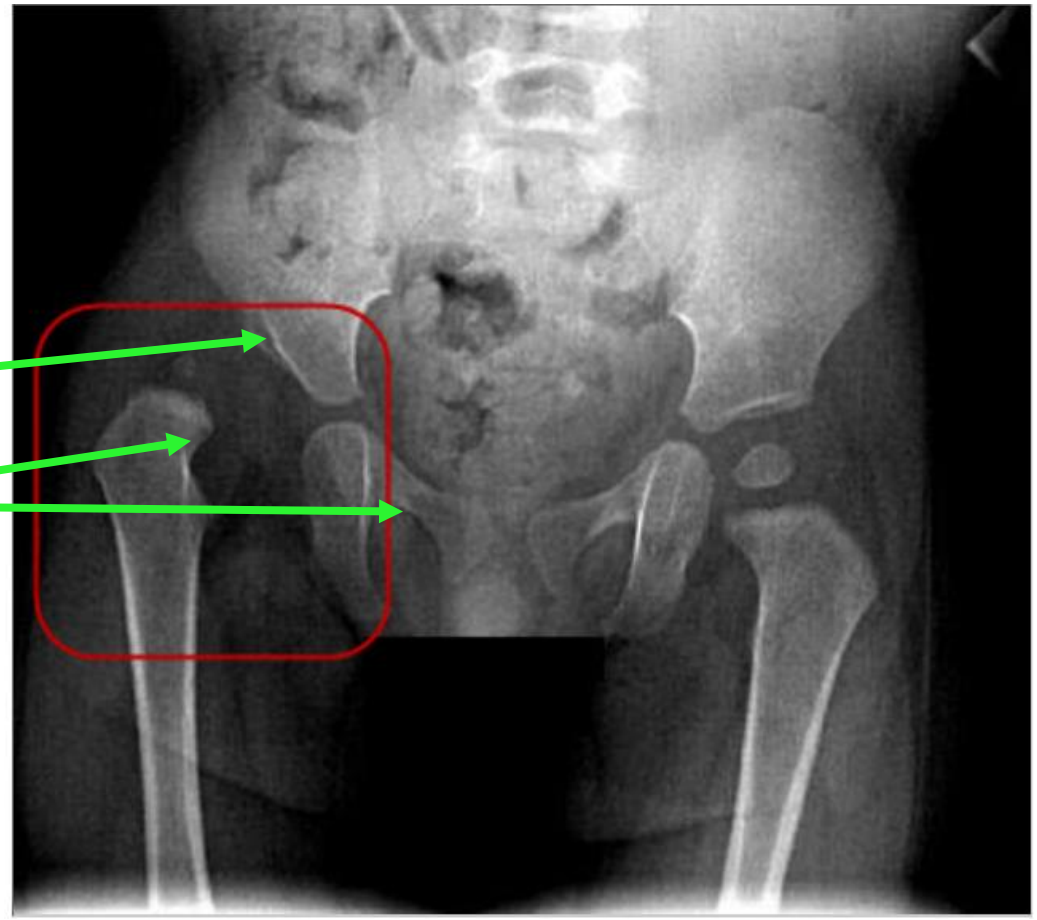


X- ray of the baby

Roof of the acetabulum

Secondary ossification center in the head of femur

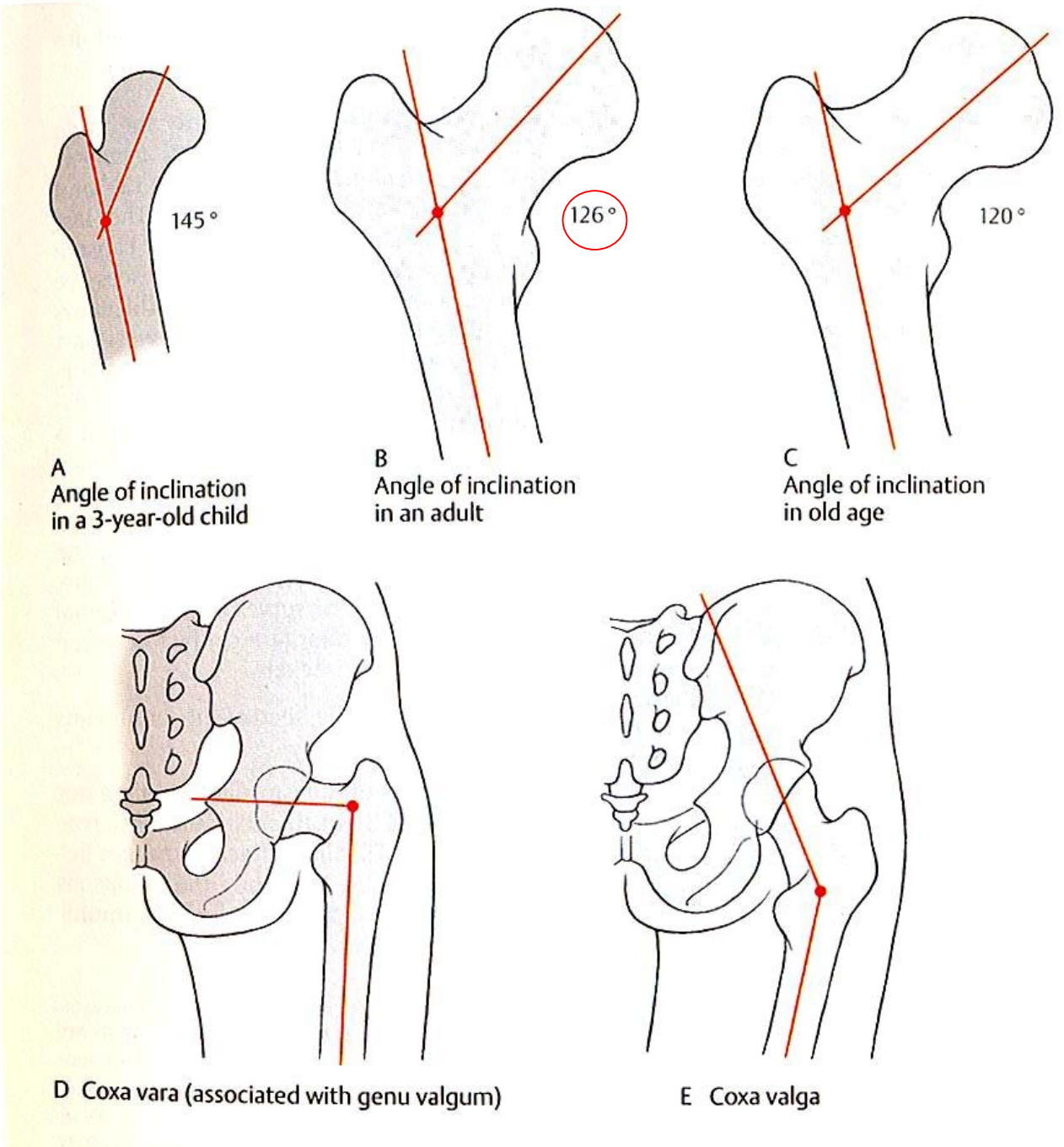
Hip dysplasia



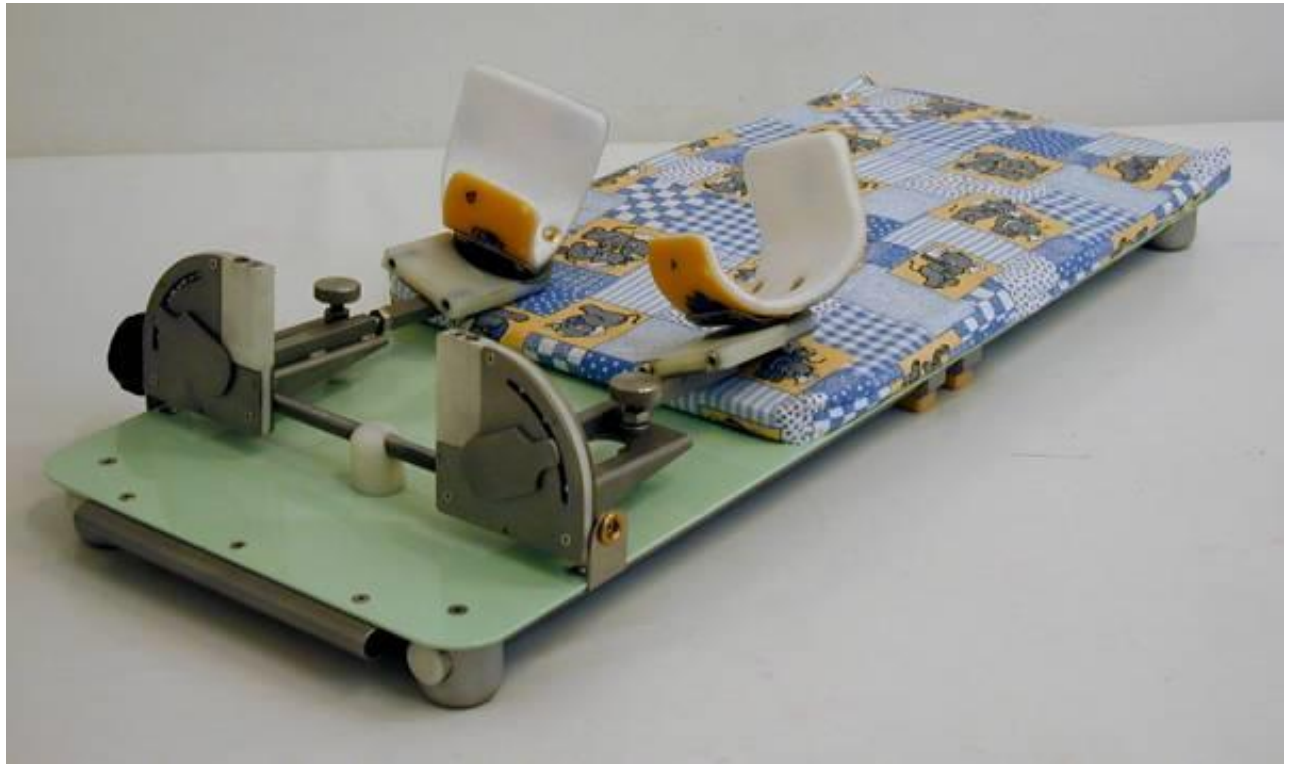
Dislocated right hip

http://hipdysplasia.org/developmental-dysplasia-of-the-hip/infant-diagnosis/x-ray-screening/

Colo-diaphysar angle

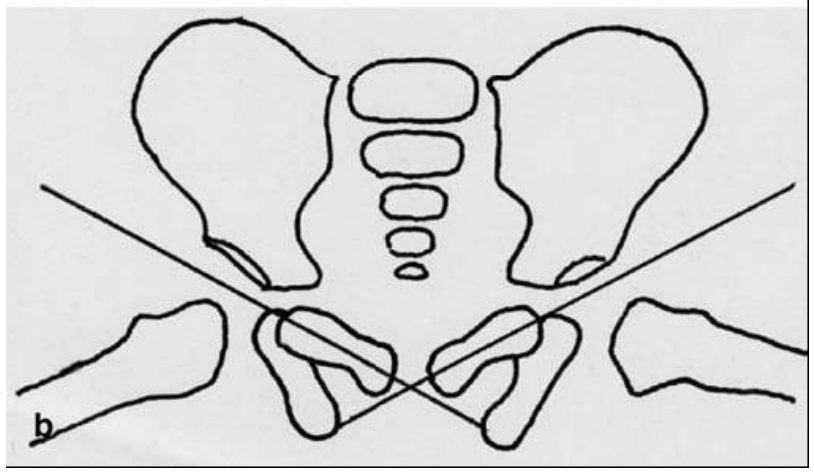


Hanausek´s apparatus



Hněvkovsky´s apparatus

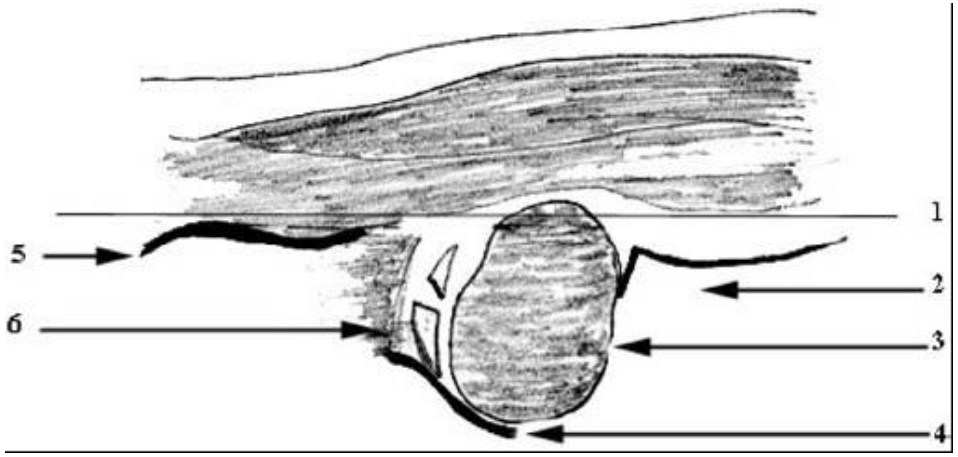
Pavlik harness – flexion, abduction

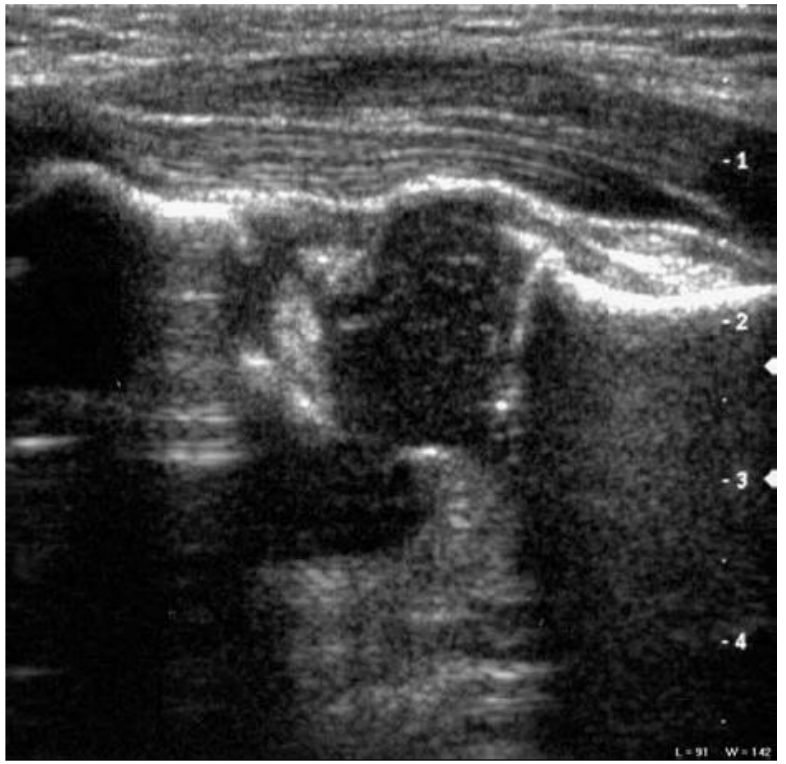


Frejka splint

Pavlik harness

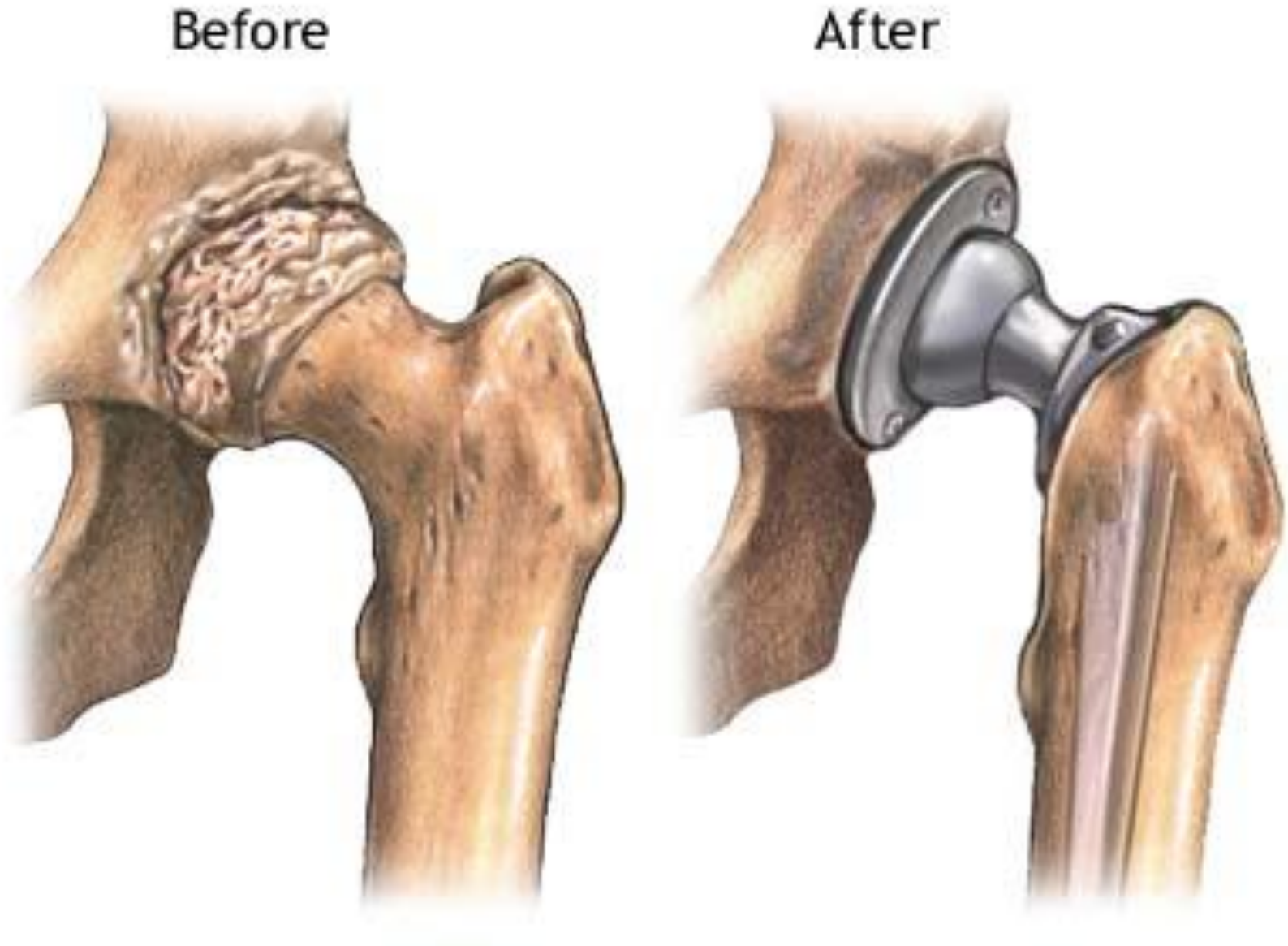
Ultrasound screening



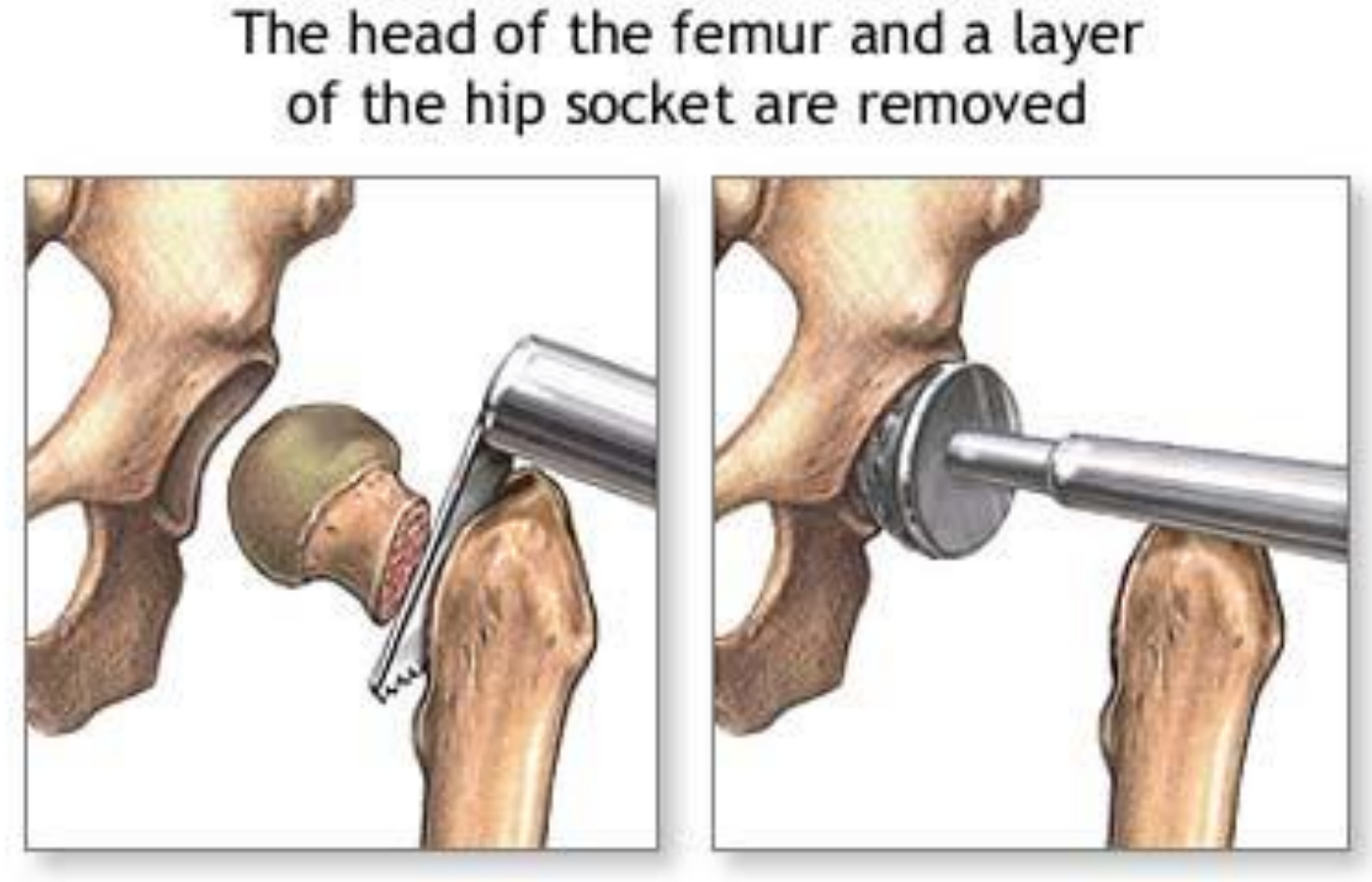


Drawing of a normal axial sonogram. *1* Alignment of pubic bone with femoral metaphysis. *2* Femoral metaphysis. *3* Femoral head. *4* Bony acetabulum. *5* Pubic bone. *6* Cartilaginous acetabulum

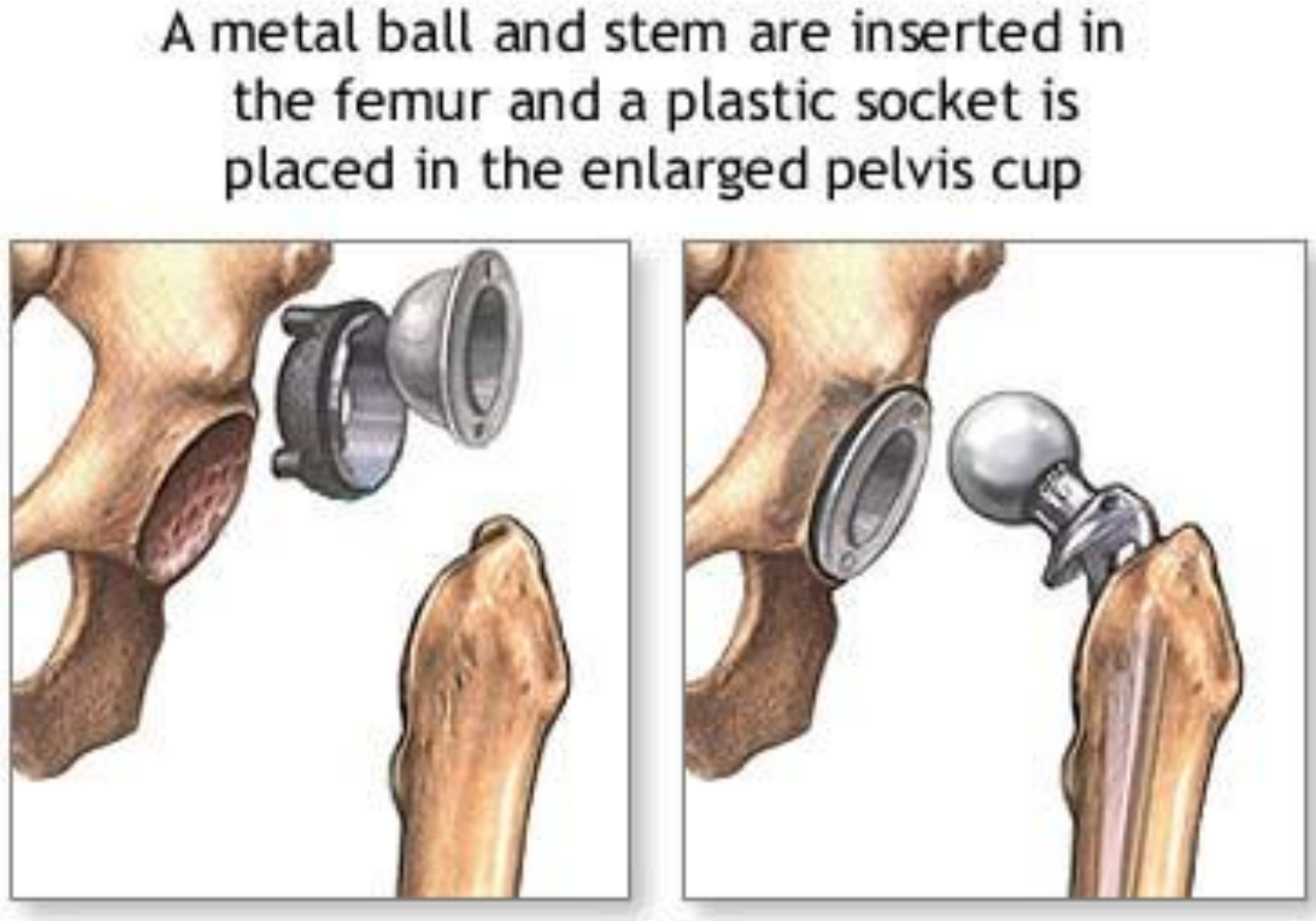
Endoprosthesis for osteoarthrosis



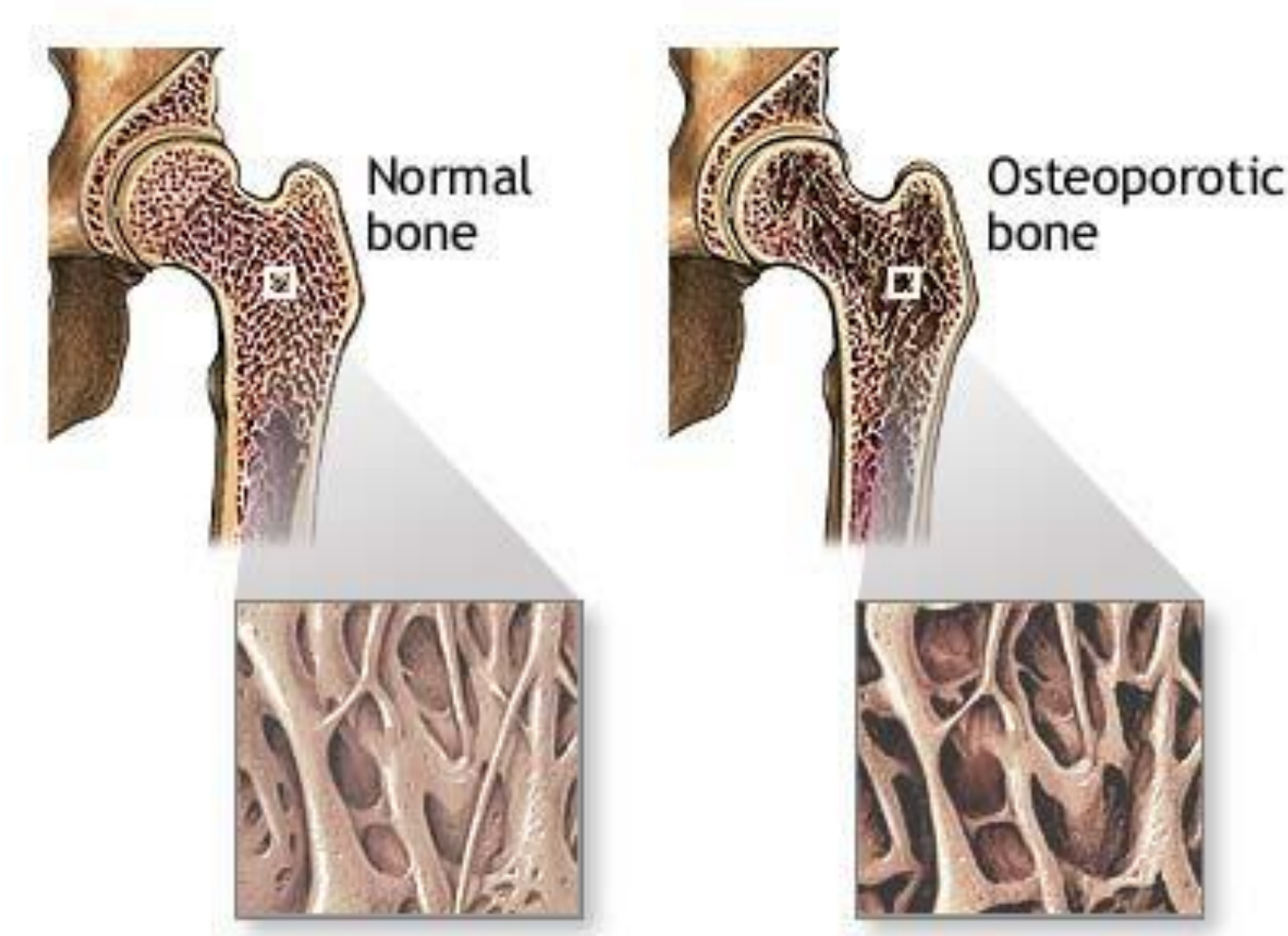
Total endoprosthesis



Total endoprosthesis



Osteoporosis - causes bones to become weak and brittle



The patient was taking a potent inhibitor of bone resorption, the first drug approved for the prevention of osteoporotic fractures. Long-term use of this drug has shown a potential rise in subtrochanteric fractures of the femur

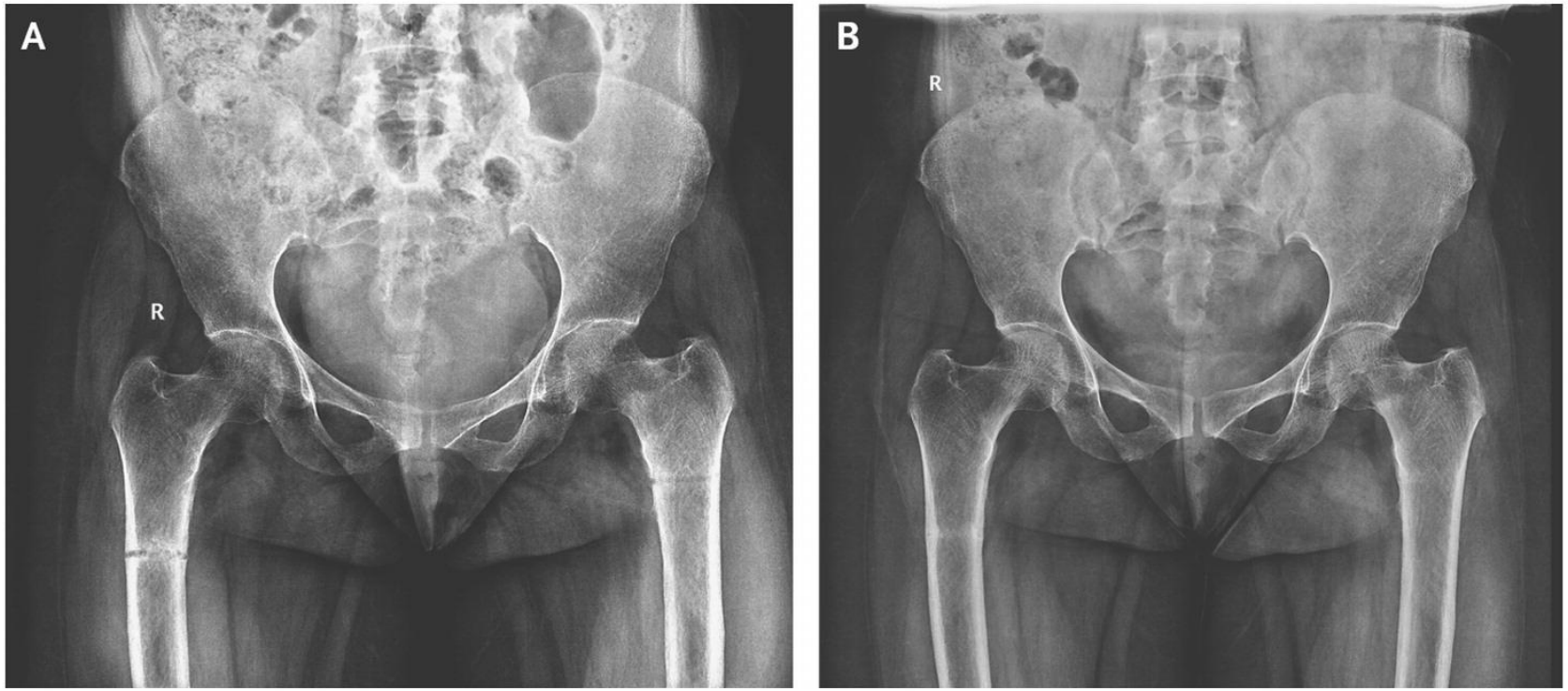
rtg

CT

abnormal bone growth in the proximal femurs

patient slipped and fractured her right femur in the area of the bone abnormality.

Osteomalacia (is the softening of the bones caused by impaired bone metabolism primarily due to inadequate levels of available phosphate, calcium, and vitamin D, or because of resorption of calcium)

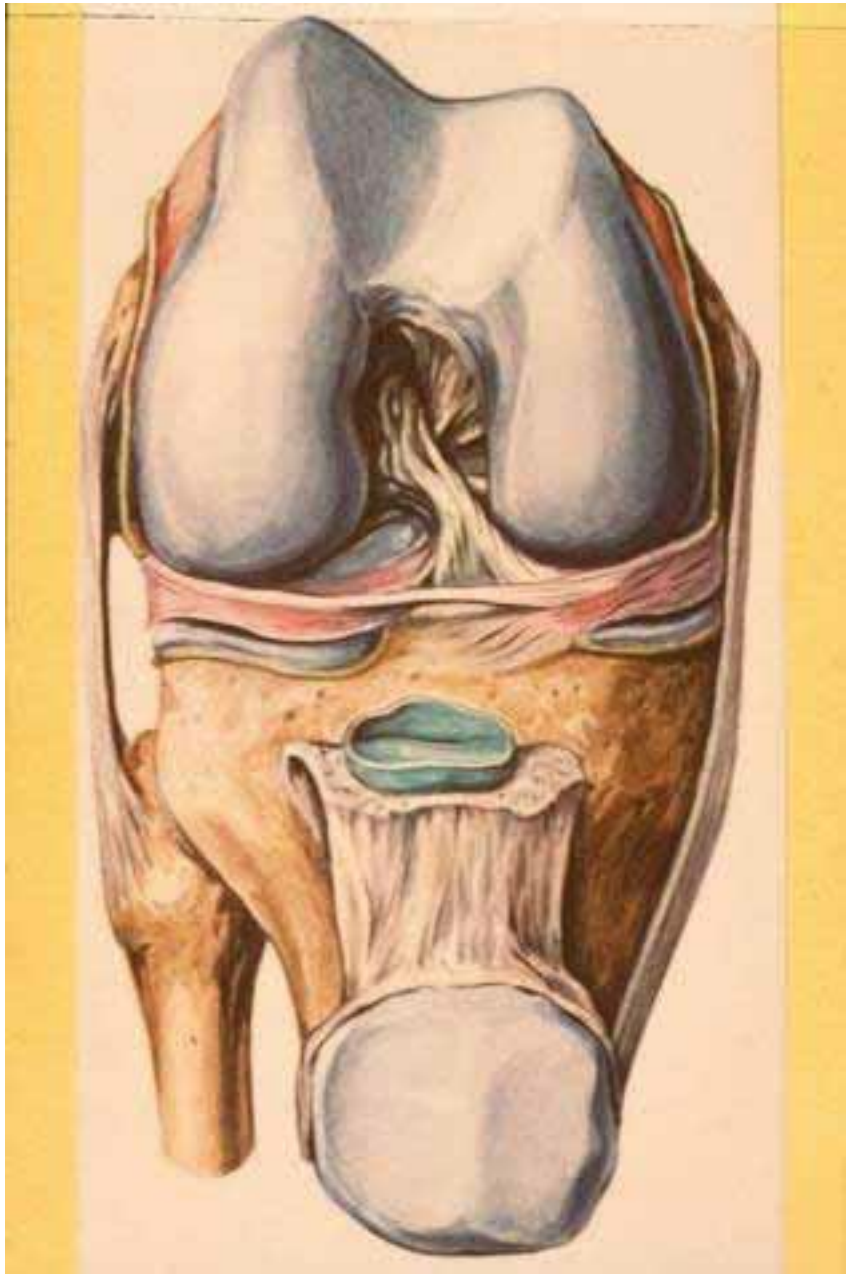


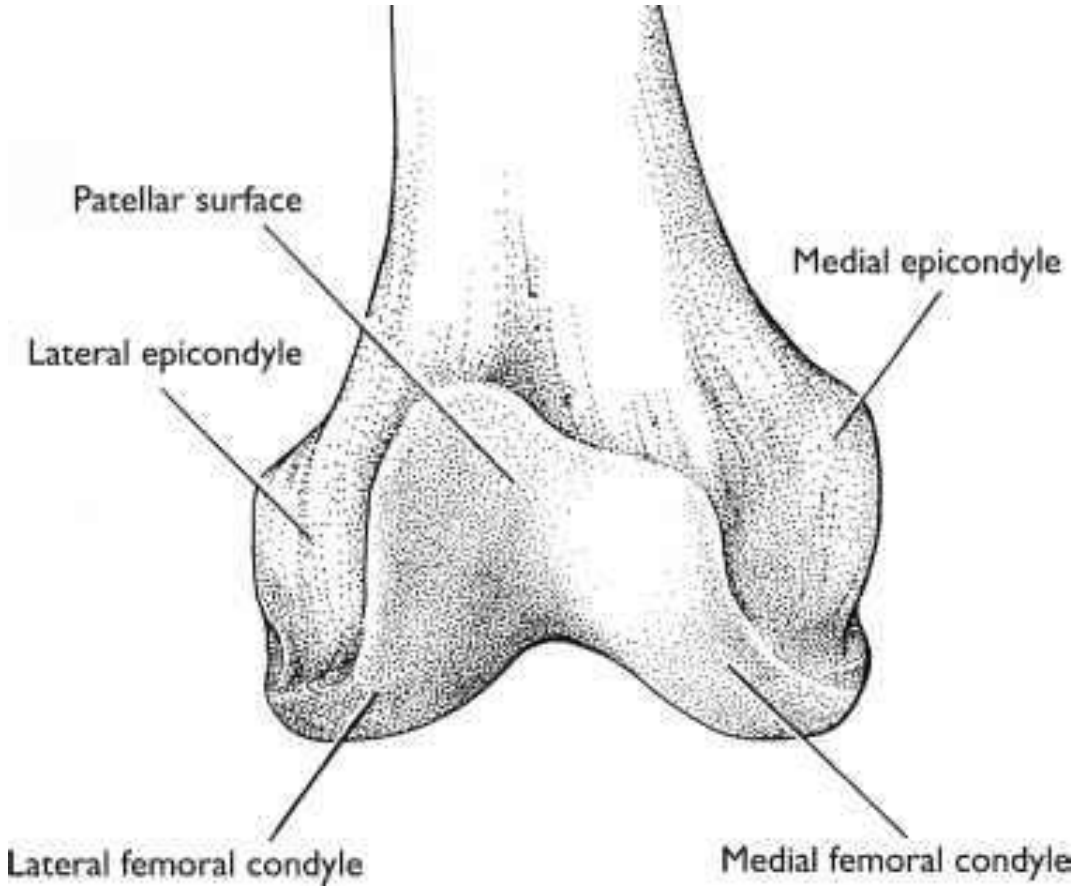
an undisplaced transverse fracture of the shaft of both femurs (Panel A). The patient was treated with therapeutic doses of calcium and vitamin D supplements. After 3 weeks, her symptoms had improved substantially, and she walked with minimal pain. Blood tests showed an increase in the phosphate level to 3.0 mg per deciliter (1.0 mmol per liter) and a decrease in the alkaline phosphatase level to 418 U per liter. A follow-up radiograph showed healed fractures (Panel B).

Reddy Munagala VV, Tomar V. N Engl J Med 2014;370:e10.

Articulatio genus
Knee joint

Complex joint:
Femur – condyles (medial and lateral), patellar surface
Tibia – condyles (medial and lateral)
Patella – articular surface on its dorsal site

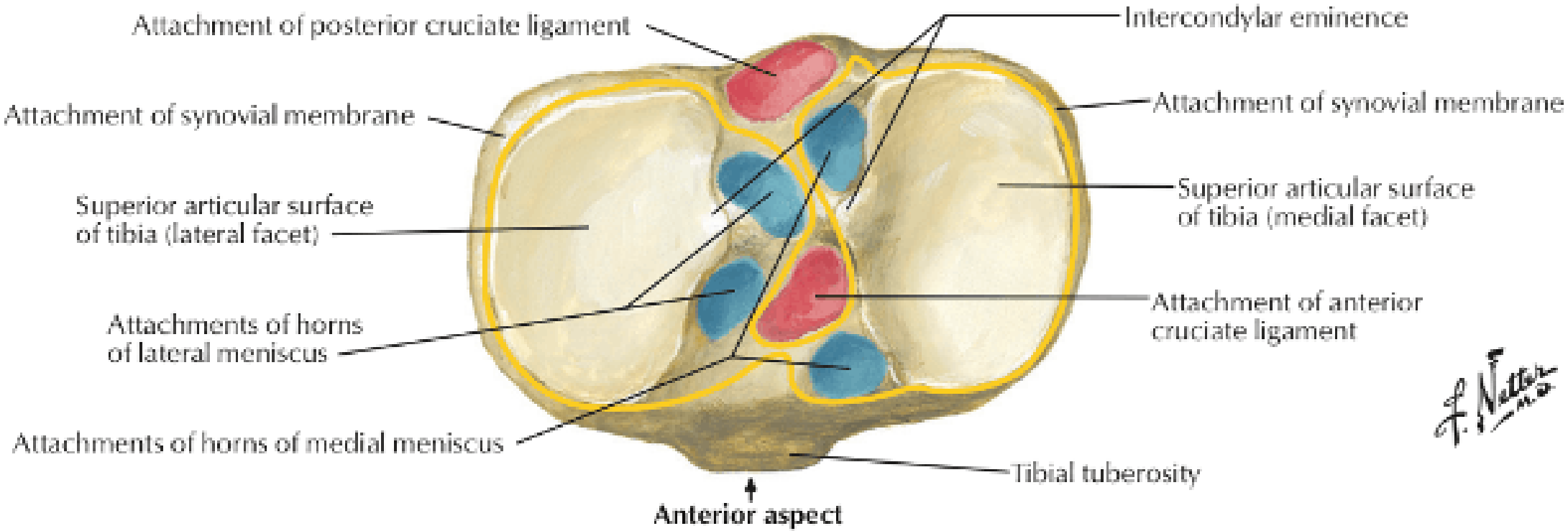




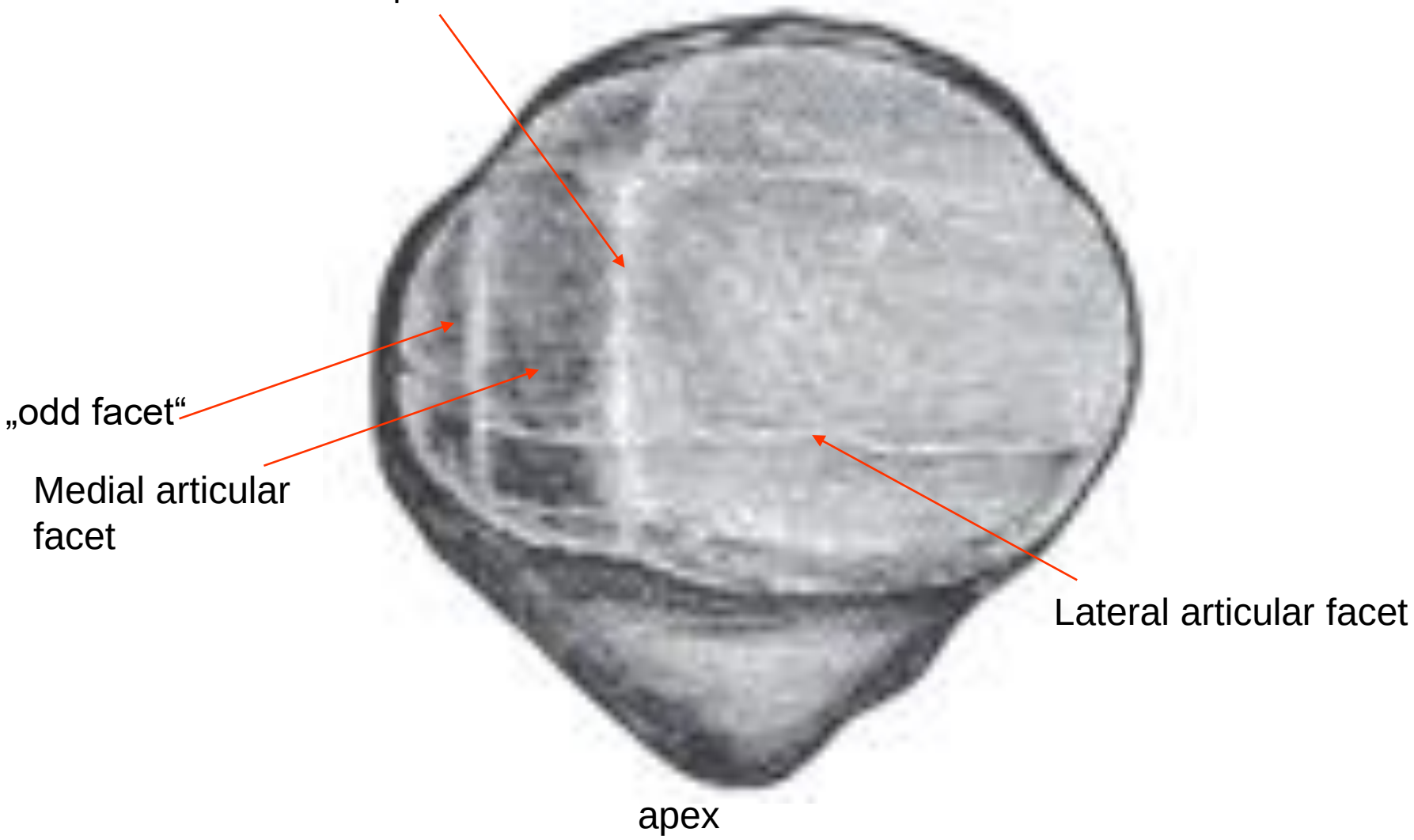
Lateral condyle in the sagittal plane

http://www.barnardhealth.us/forensic-radiology/femur.html

Superior surface of tibia



Patella - posterior aspect



Odd facet

the first part of the patella to be affected in premature degeneration of articular cartilage

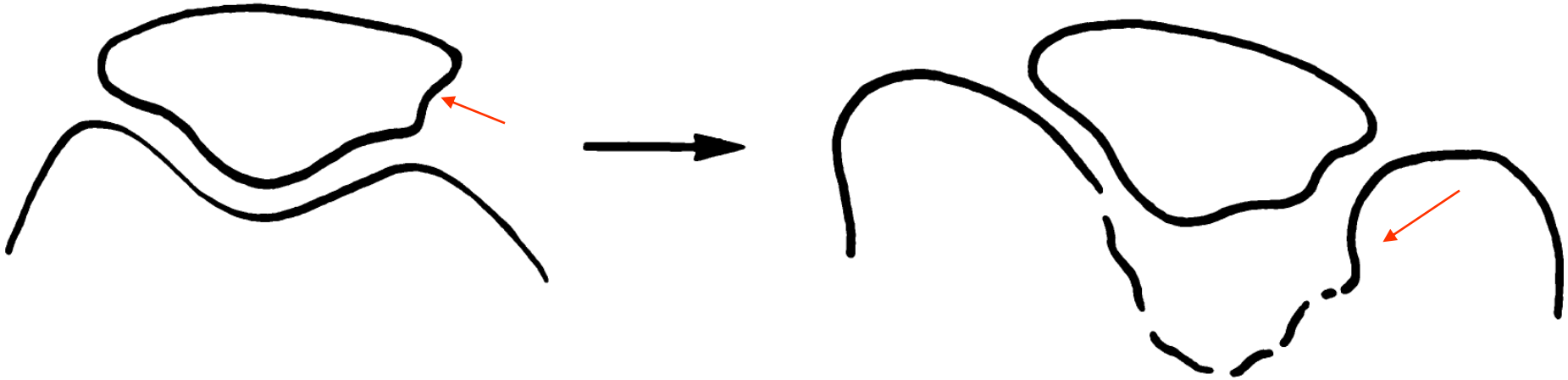


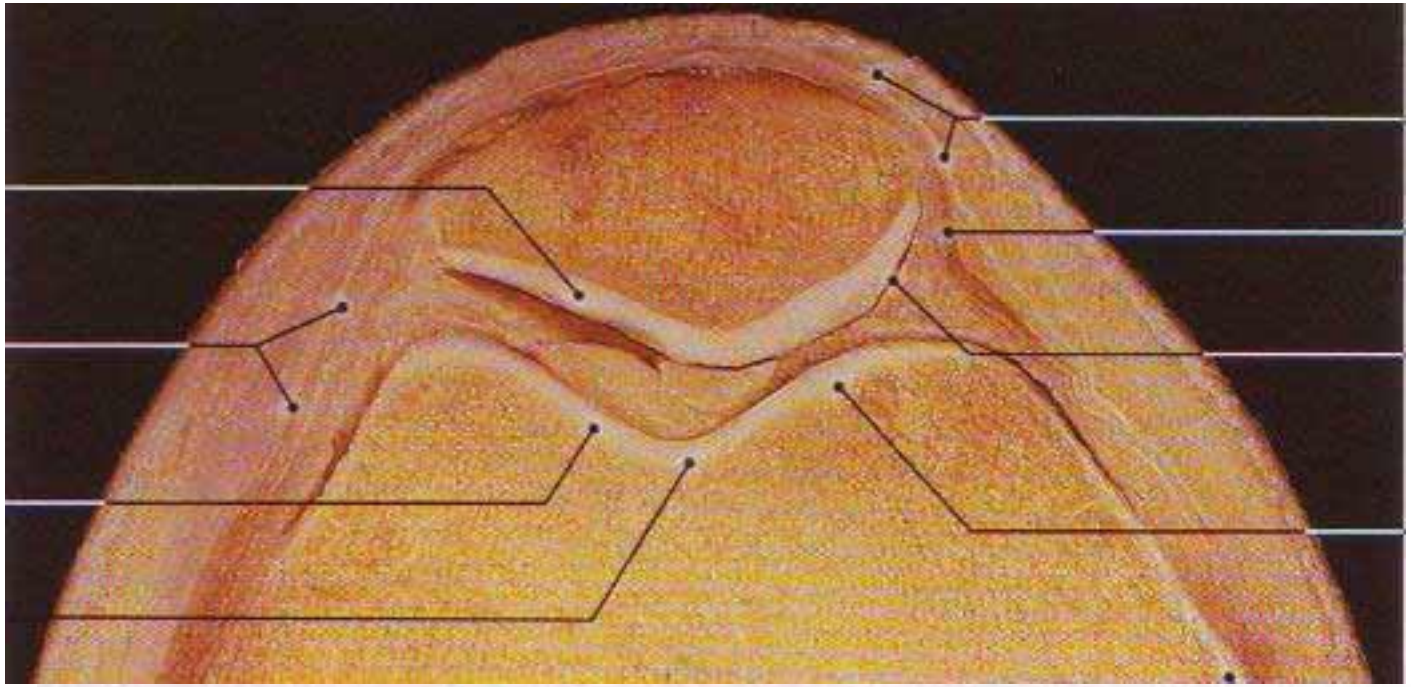
FIG. 8

FIG. 9

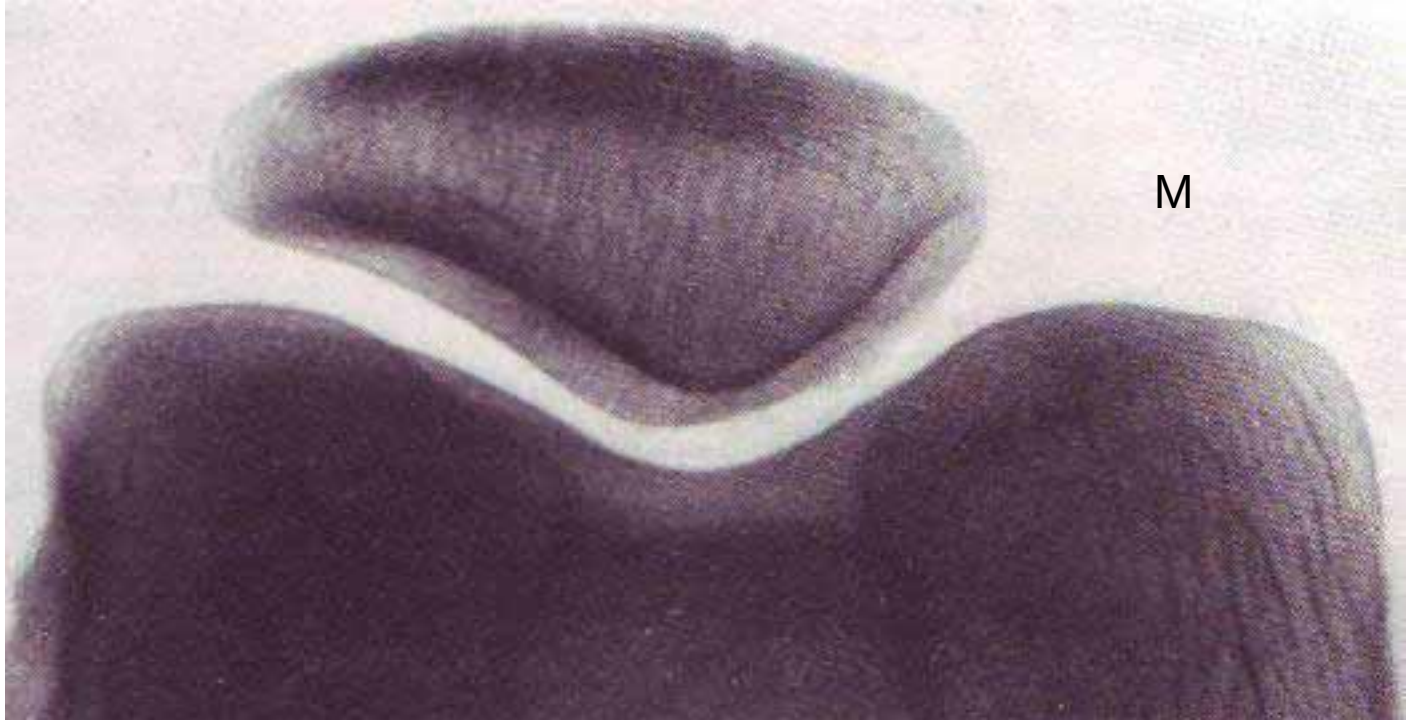
Figure 8—From full extension to 90 degrees the patellar facets of the femur articulate with the medial and lateral facets of the patella. Figure 9—Beyond 90 degrees the patella rotates and the medial femoral condyle articulates with the odd facet.

Patellar function:

1) increases the leverage that the tendon can exert on the femur by increasing the angle at which it acts.
2) Centralizes the action of portions of quadriceps femoris
3) Protects anterior part of the knee
4) Esthetic of the knee



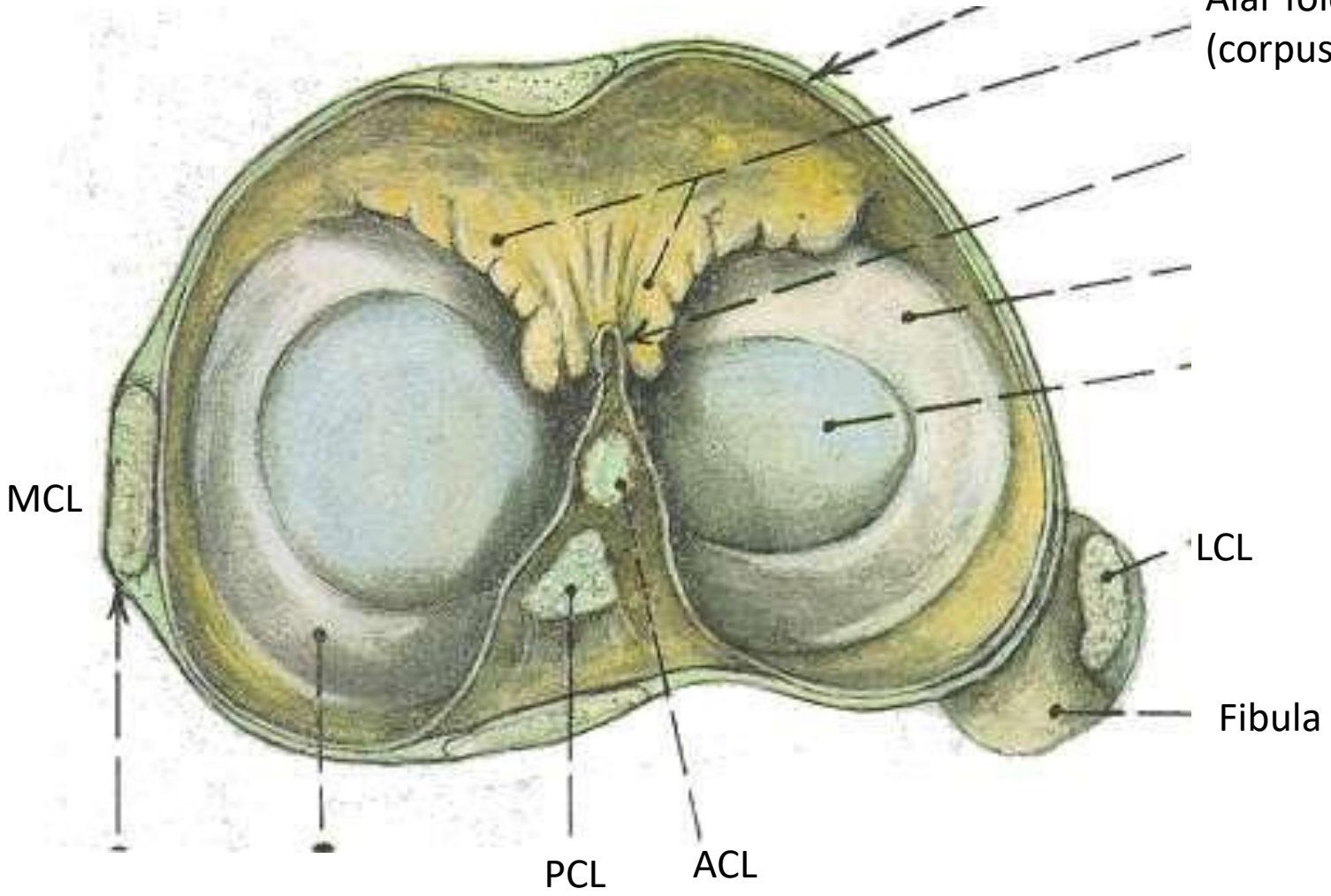
L



M

Meniscs
Cruciate and collateral ligaments

Joint capsule attachment



synovial and fibrous layer of capsule are separated cruciate ligg are intracapsular but extra-articularly

Iliotibial tract

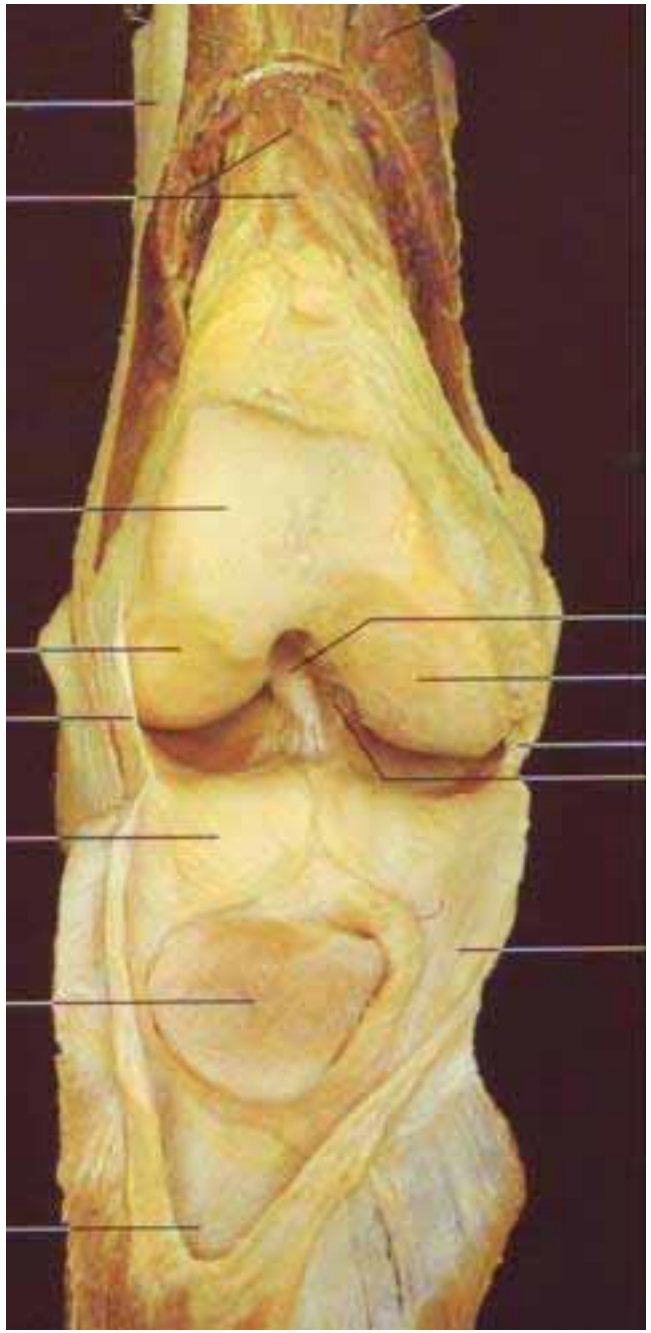
Knee joint cavity

Patellar surface

Adipous body

patella

Suprapatellar recess

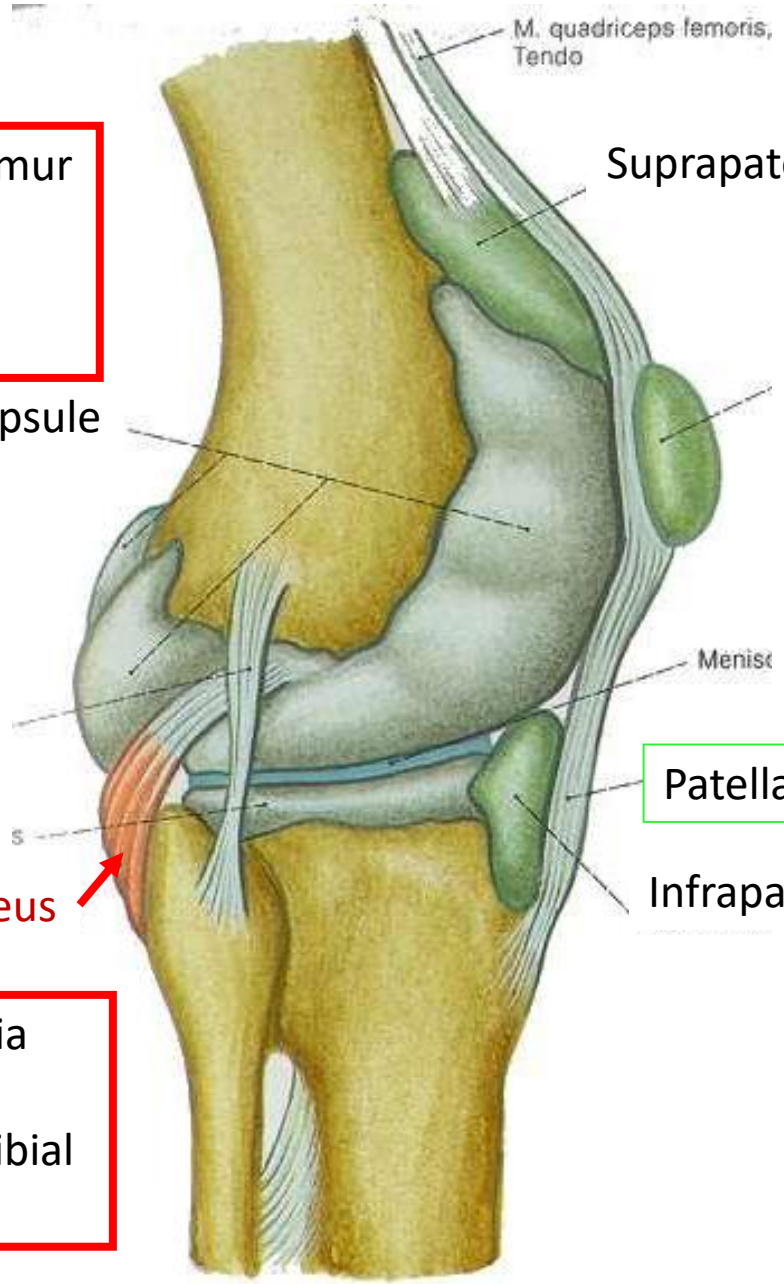


ACL covered by synovial membrane

Medial condyle

PCL

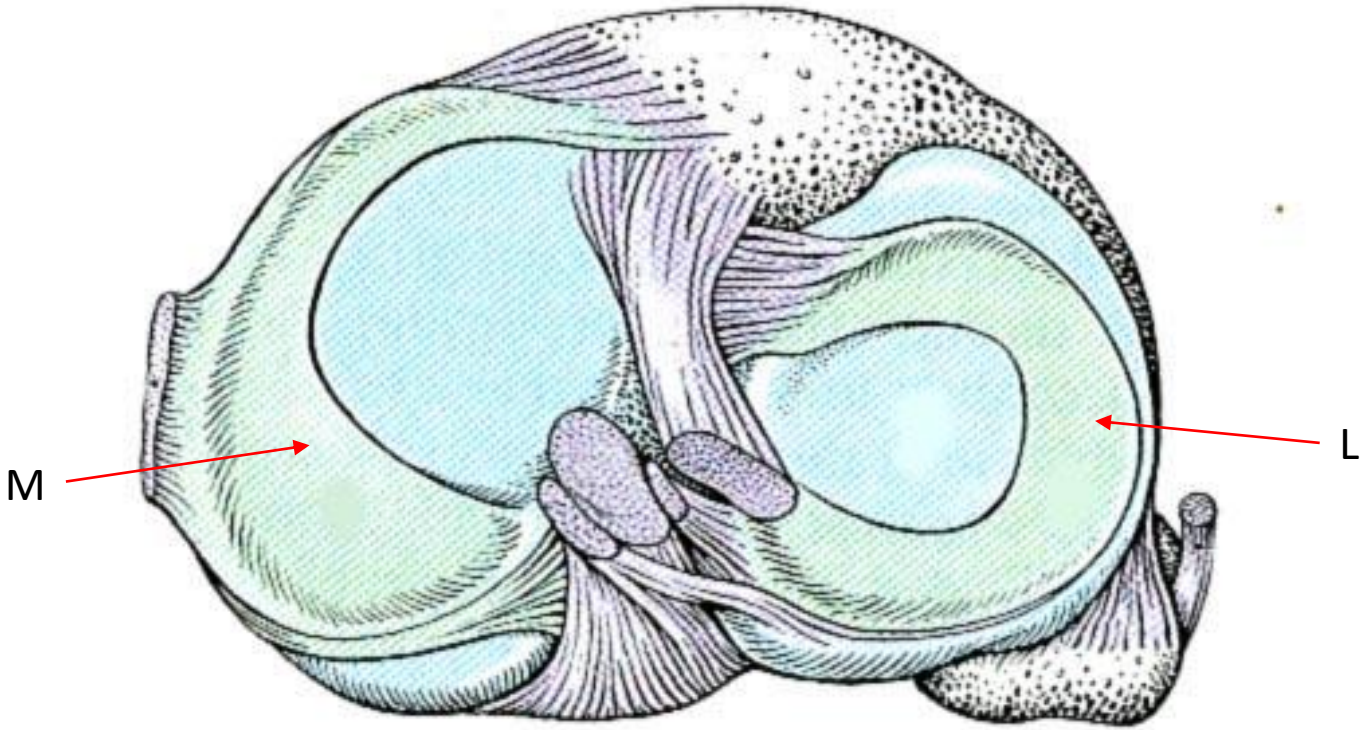
Joint capsule attachement on femur
Condyles inside
Epicondyles outside
Anteriorly suprapatelar recess



Joint capsule attachement on tibia
On the margins of condyles
Anteriorly extends down to the tibial tuberosity

Meniscus – from fibrous cartilage

medial „C“ menisc (fused with the medial collateral lig. and more vulnerable)
and lateral „O“ menisc (more mobile), less stressed

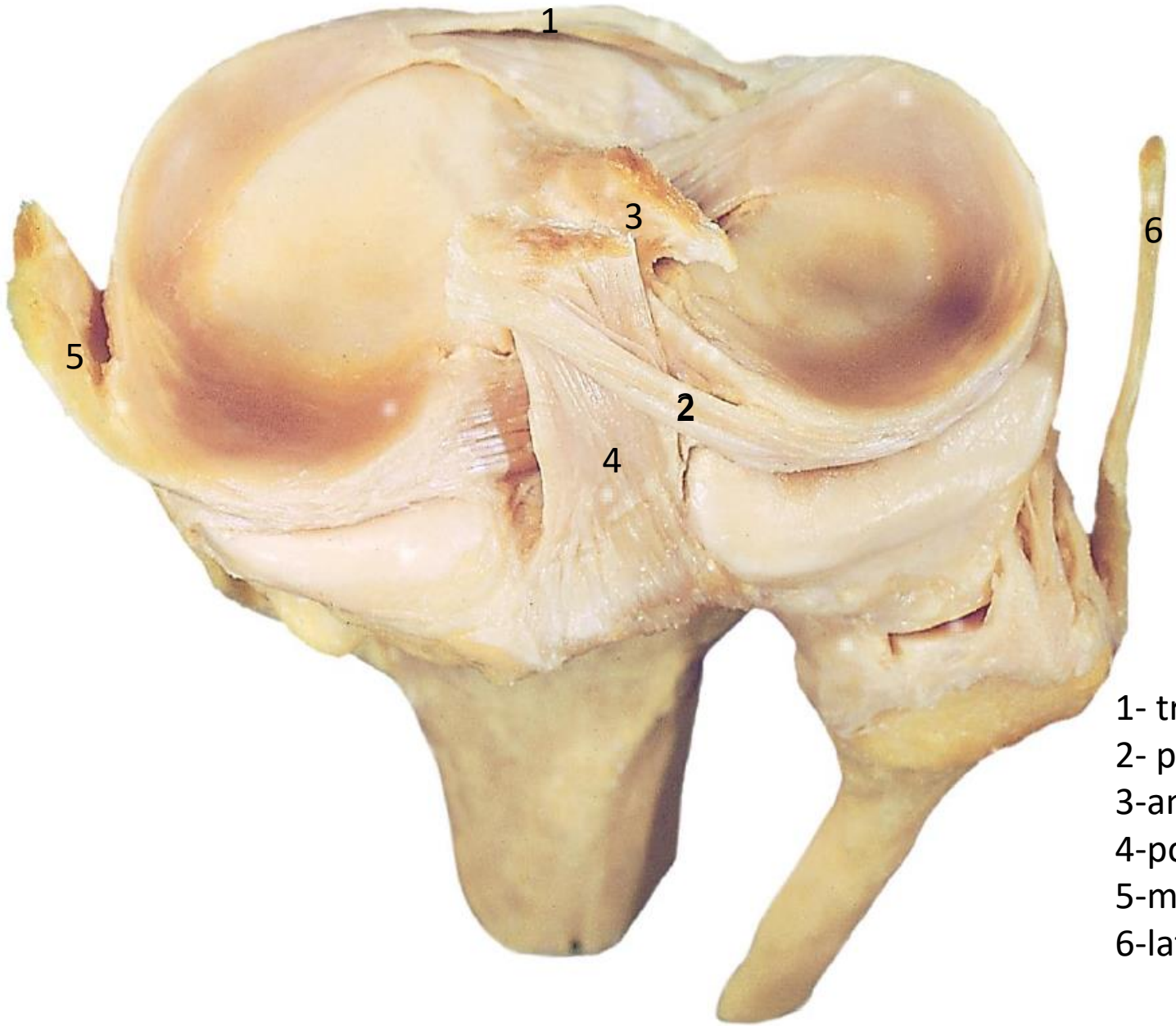


Function of meniscs:

1) occupy 60% of the contact area between the articular cartilage of the femoral condyles and the tibial plateau (smooth movement)
2) transmit >50% of the total axial load applied in the joint (shock absorber)
3) spread a thin film on synovial fluid (nutrition of the cartilage)

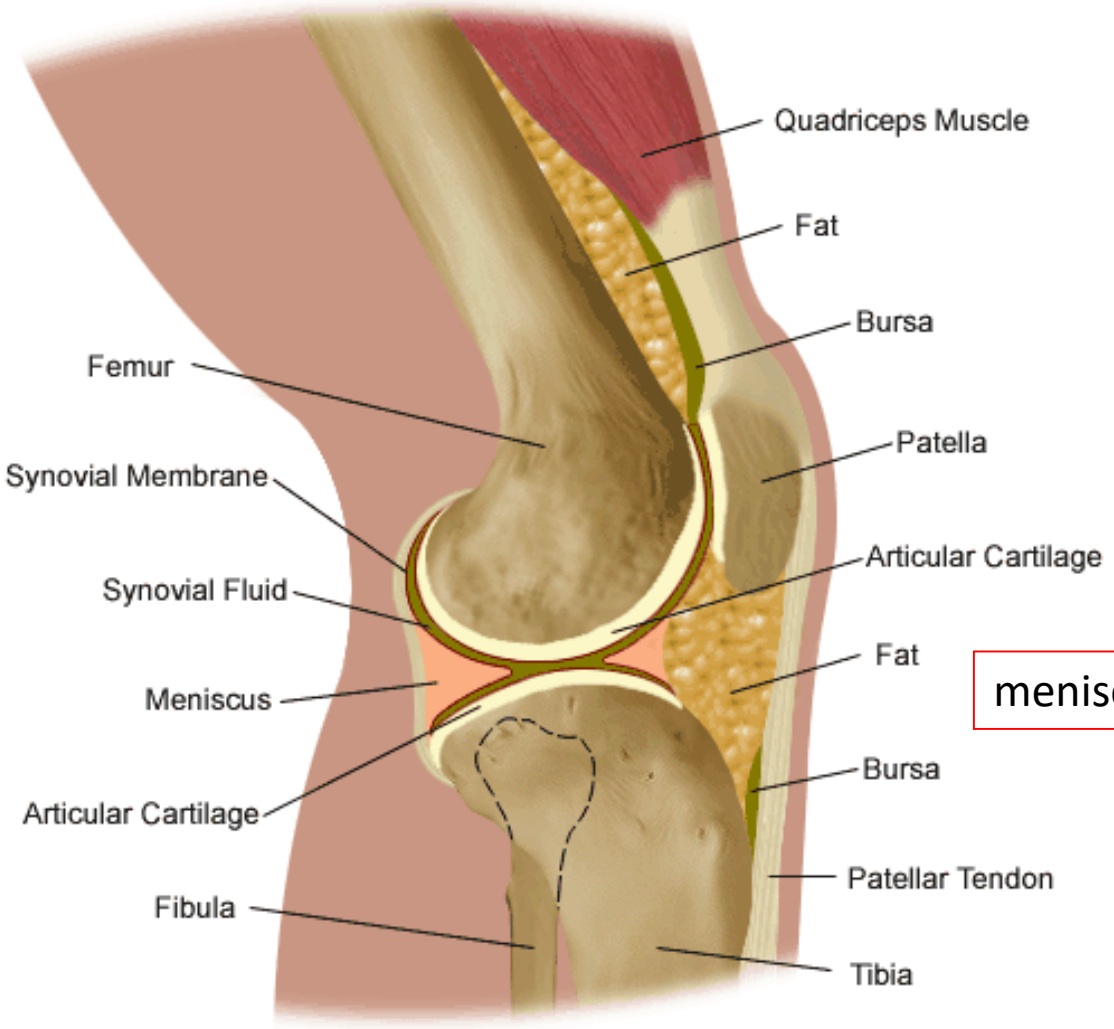
Meniscal tear – mostly medial menisc – treated by arthroscopy

Superior aspect of tibia, menisci and ligaments of knee joint

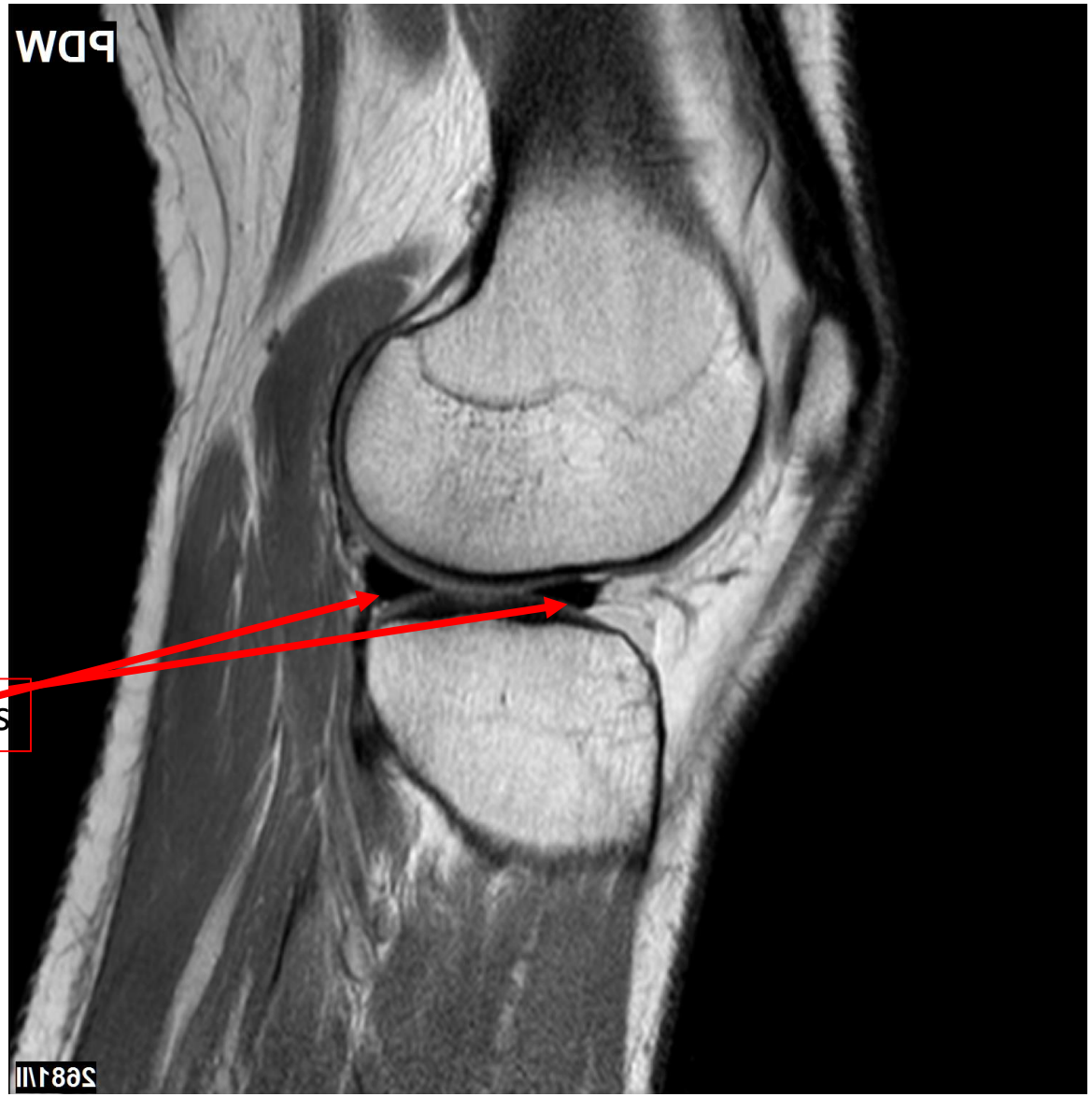


1- transverse lig. of genus
2- posterior meniscofemoral ligament
3-anterior cruciate lig.
4-posterior cruciate lig.
5-medial collateral lig.
6-lateral collateral lig.

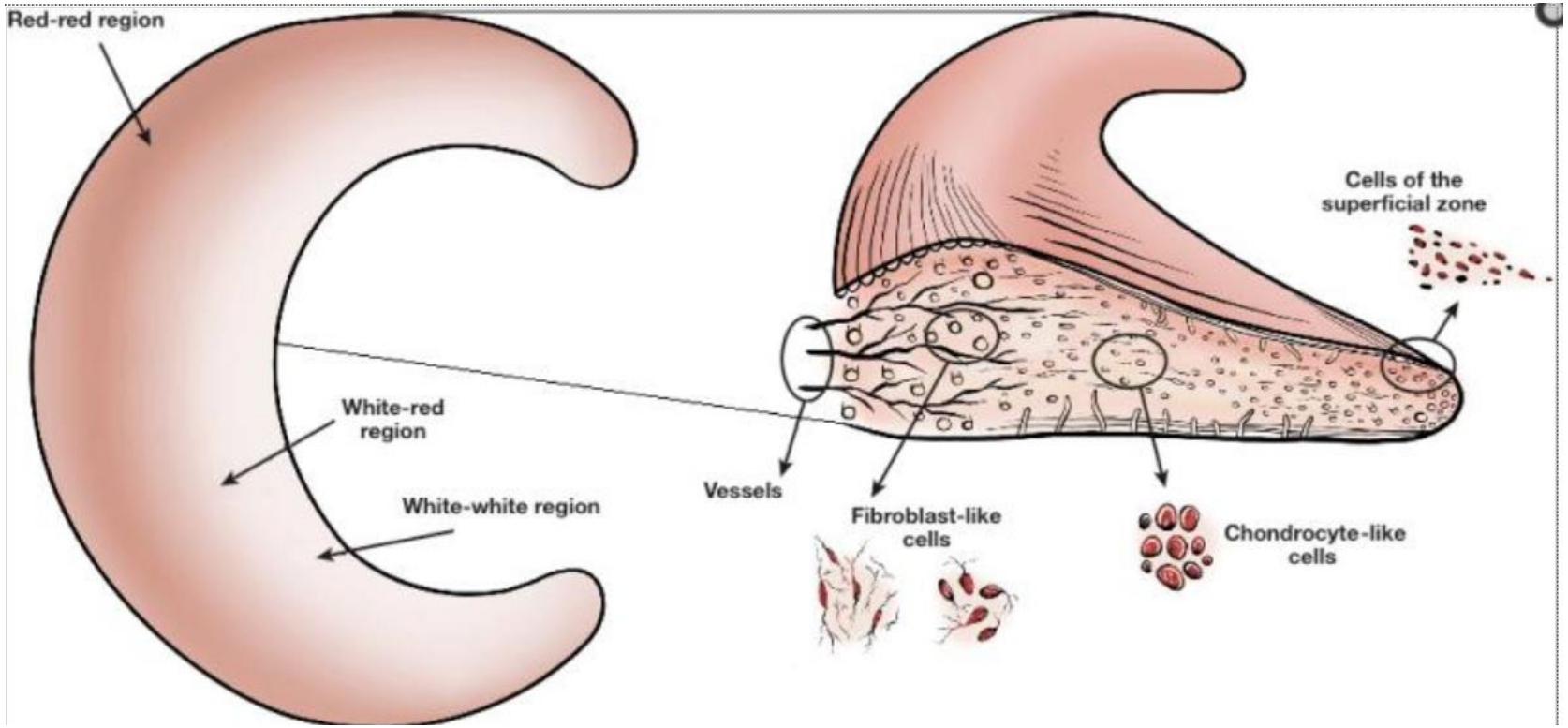
Sagittal section of the knee



Knee MRI

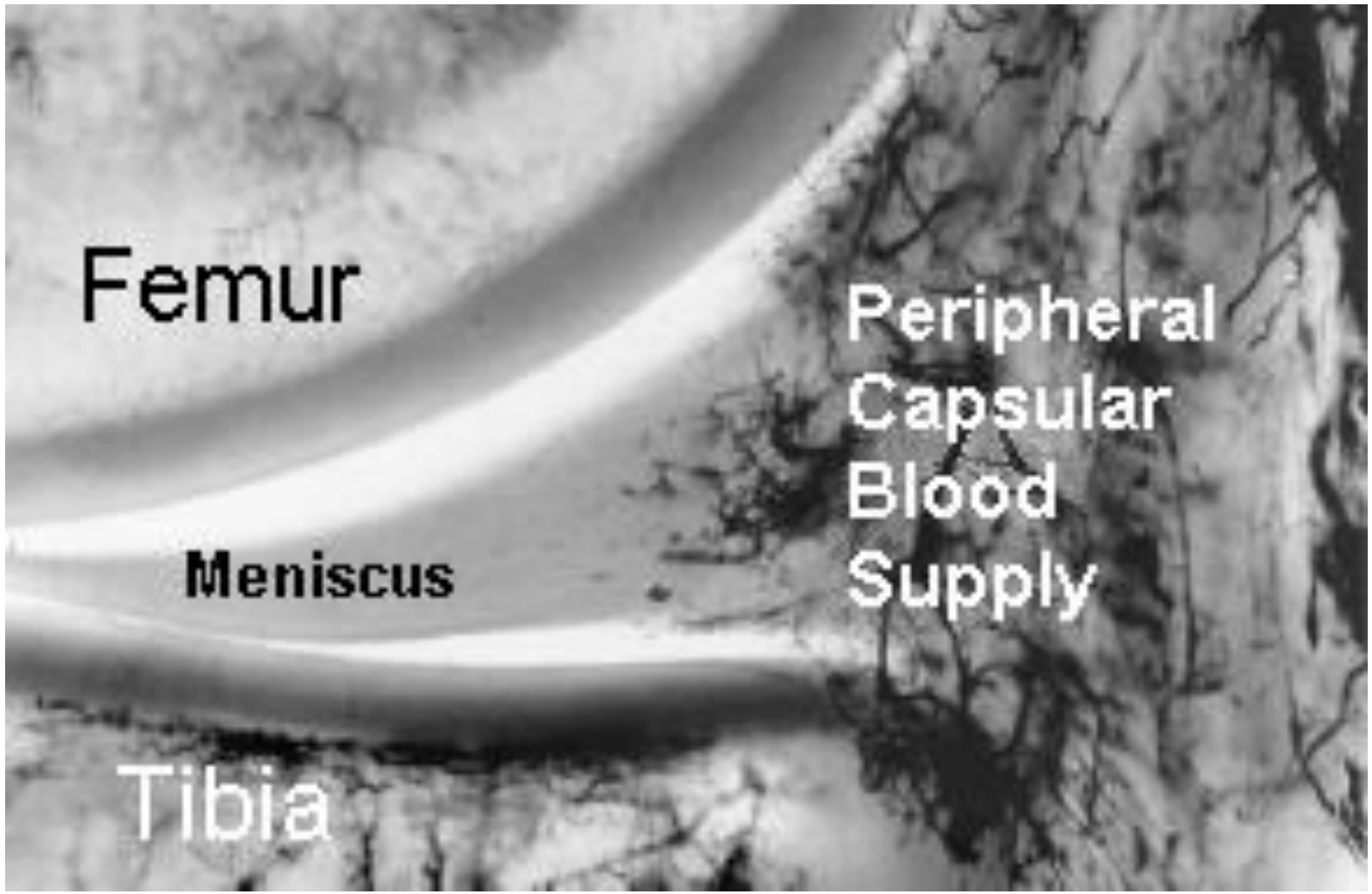


Regional variations in vascularization and cell populations of the meniscus



Cells in the outer, vascularized section of the meniscus (red-red region) are spindle-shaped, display cell processes, and are more fibroblast-like in appearance, while cells in the middle section (white-red region) and inner section (white-white region) are more chondrocyte-like, though they are phenotypically distinct from chondrocytes. Cells in the superficial layer of the meniscus are small and round.

The knee meniscus: structure-function, pathophysiology, current repair techniques, and prospects for regeneration
Eleftherios A. Makris, MD,[1] Pasha Hadidi, BS,[1] and Kyriacos A. Athanasiou, Ph.D., P.E, Biomaterials 2011

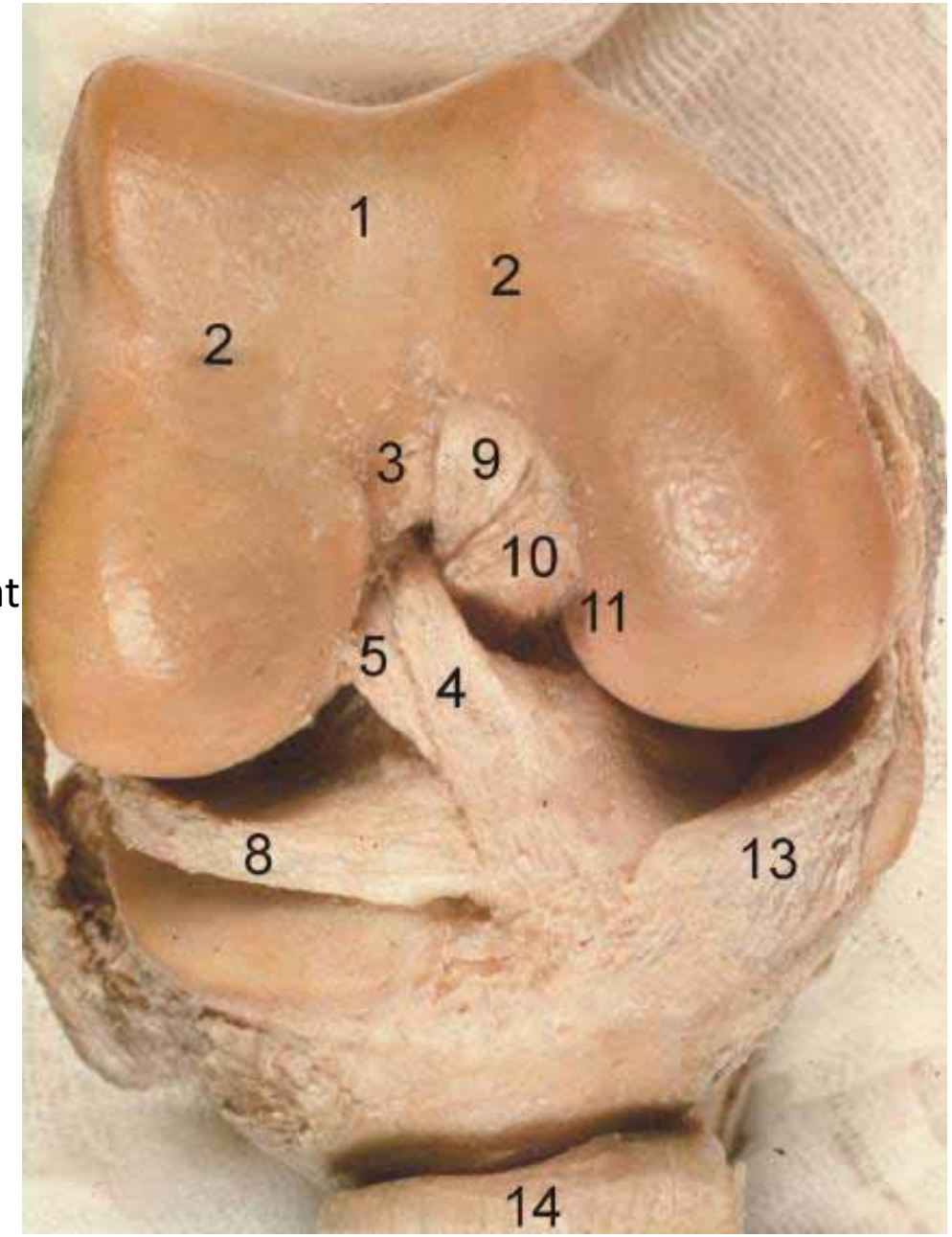

Femur
Meniscus
Tibia
Peripheral
Capsular
Blood
Supply

Cruciate ligaments:

Anterior -4,5 –lateral condyle-anterior intercondylar area

Posterior- 9,10 – medial condyle – posterior intercondylar area
thicker than ACL

Lat

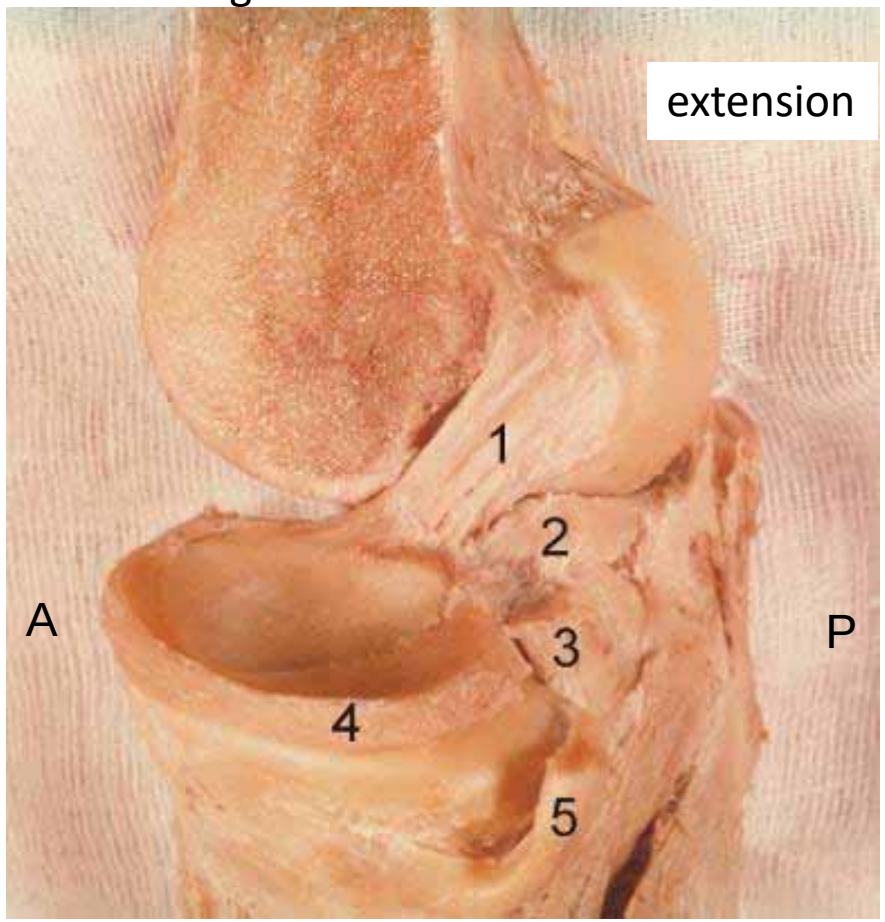


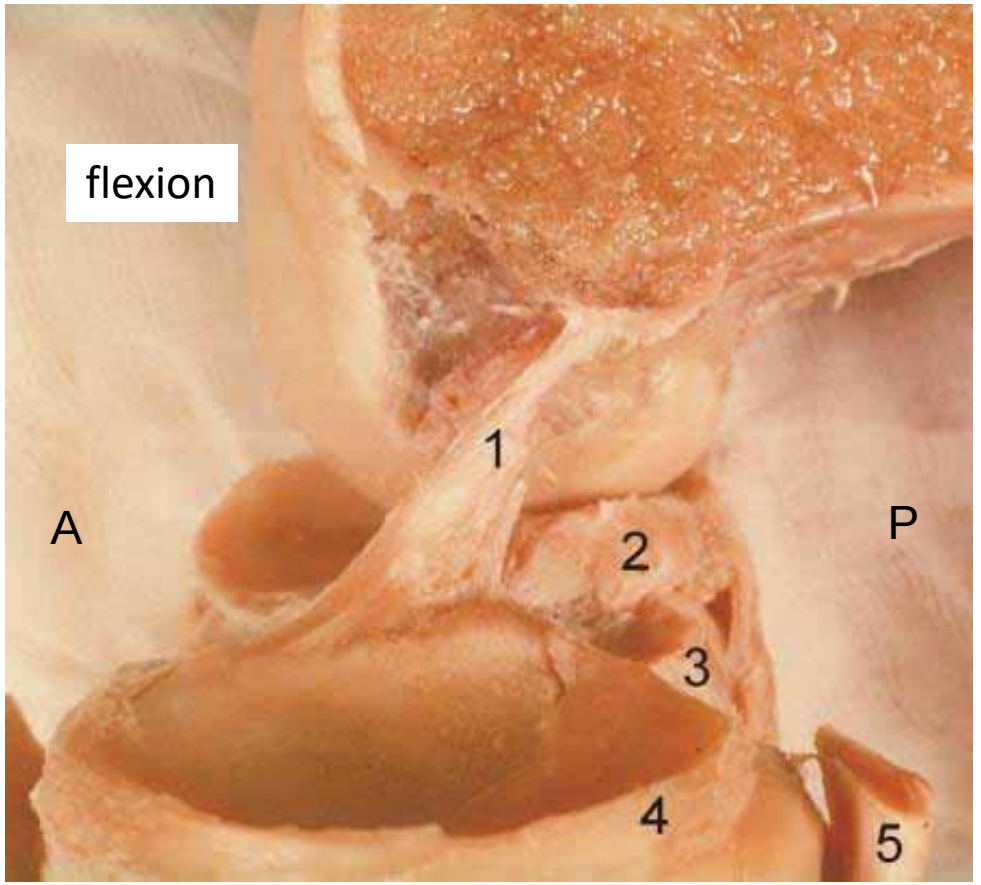
Med

1-facies patellaris
2-condylopatellar lines
13- medial meniscus
8 - lateral meniscus
14- patellar ligament

intracapsular but extra-articular ligaments

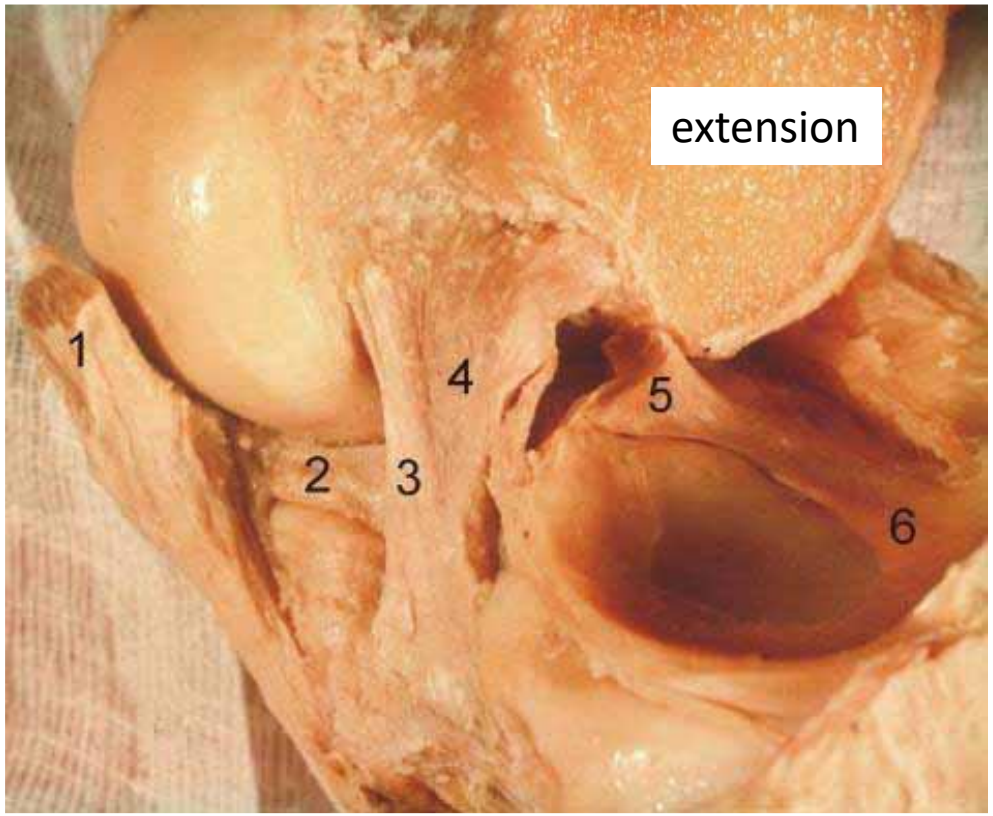
Anterior cruciate ligament (ACL)
- Most often injured knee ligament

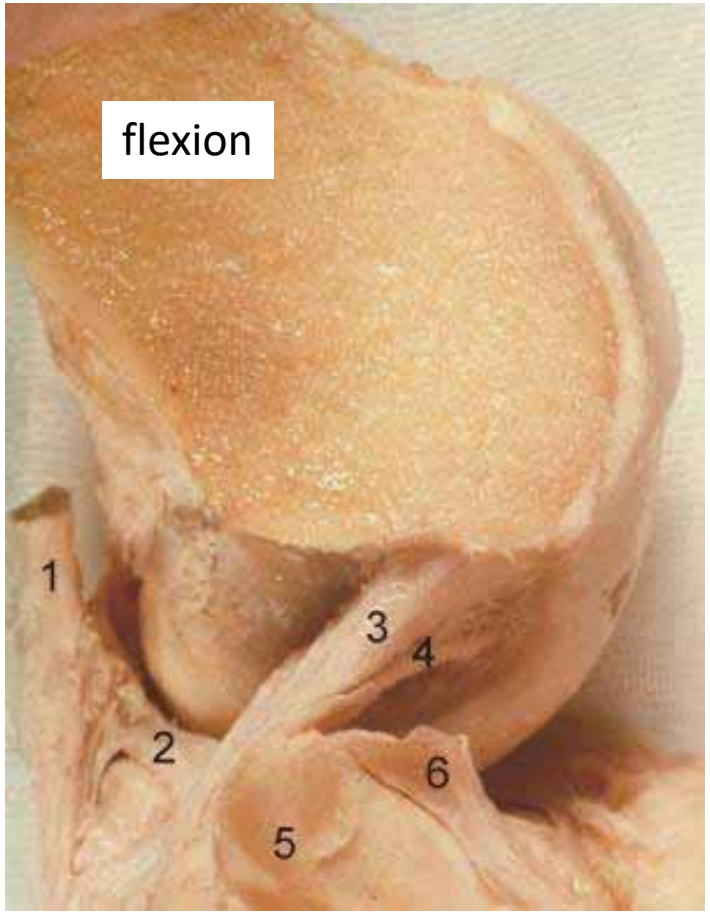




Medial aspect of the ACL, medial femoral condyle removed
1-ACL, 2-lateral menisc, 3-posterior cruciate lig, 4- medial menisc, 5-m.semimembranosus

Posterior cruciate ligament (PCL)



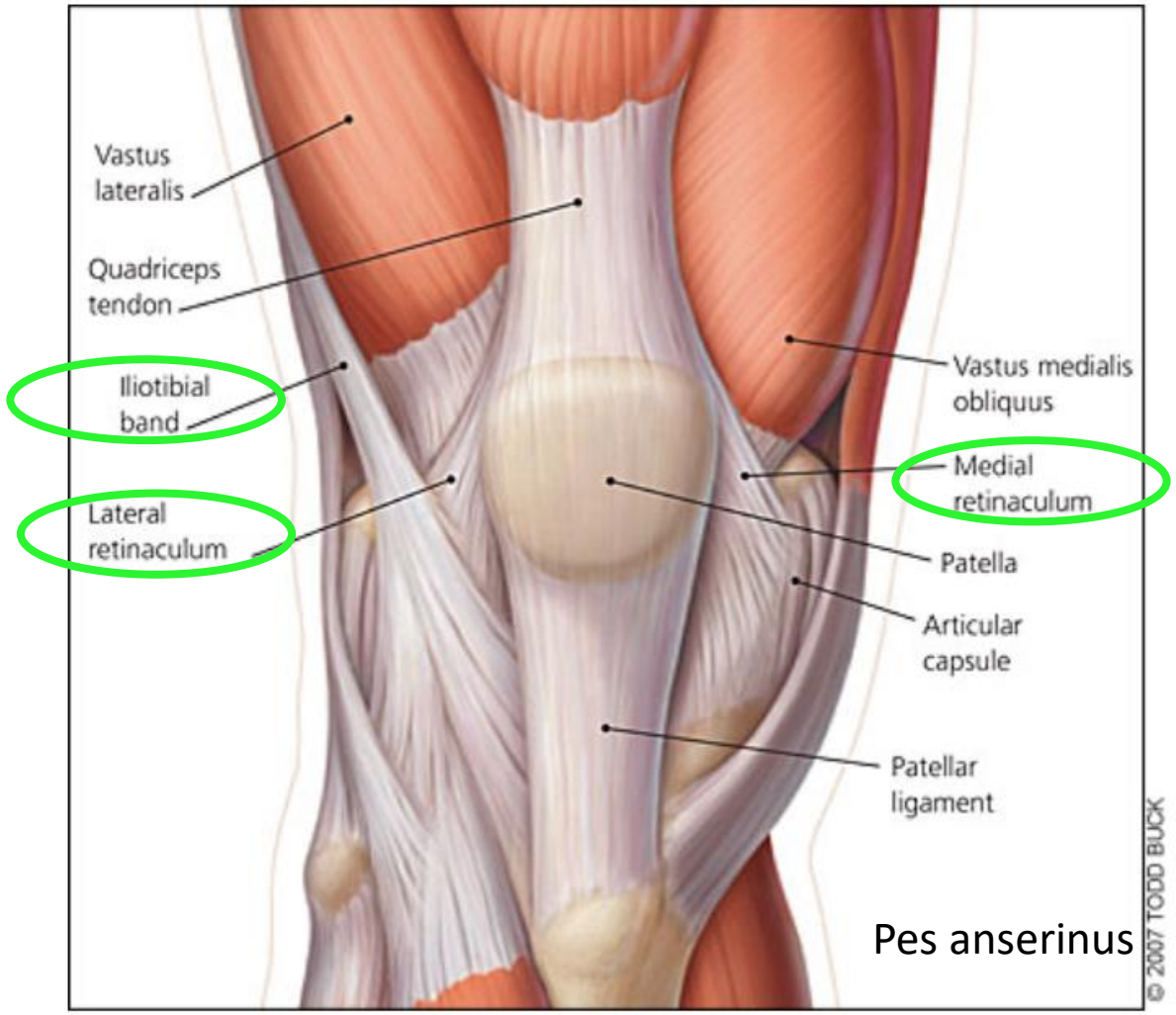


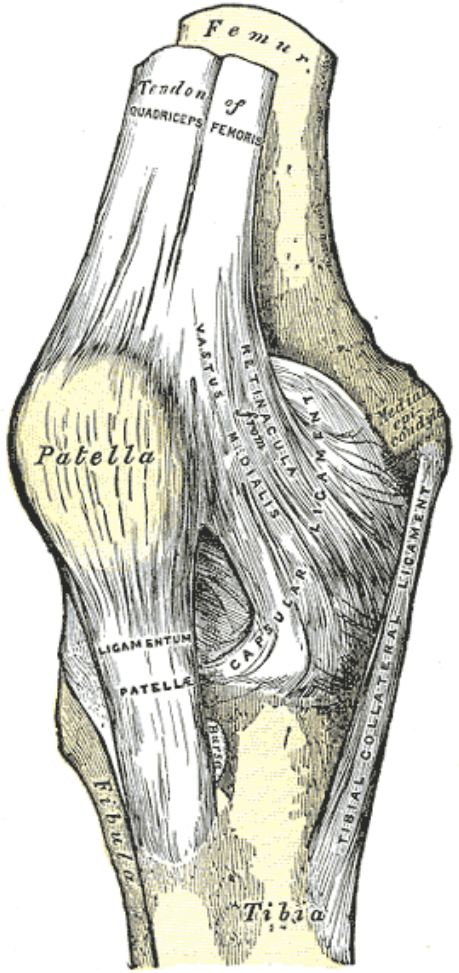
Lateral aspect of the PCL (3,4), lateral condyle is removed
1-m.semimembranosus, 2- medial menisc, 5-ACA, 6-lateral menisc

Capsular ligaments:

Patellar ligament – tendon of the quadriceps femoris
Retinacula patellae – medial and lateral

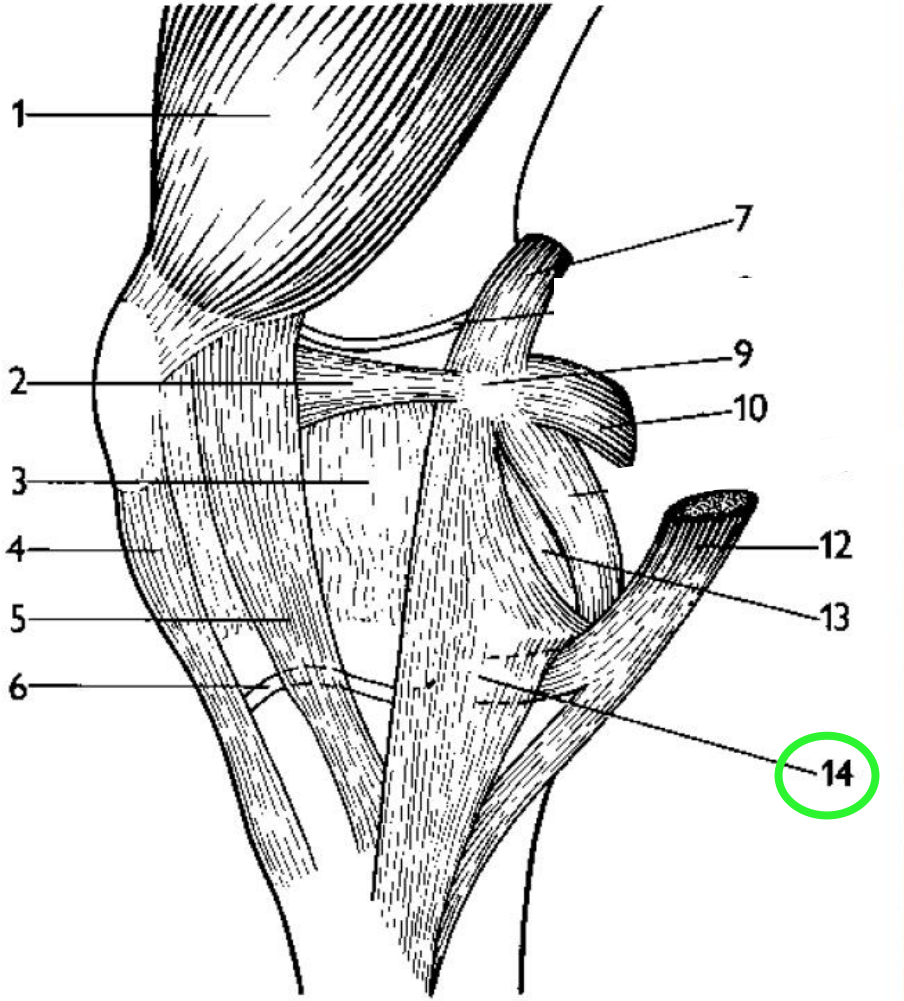
Iliotibial tract – lateral thick part of the fascia lata – attached to the Gerdy´s tubercle laterally from the tibial tuberosity





Medial collateral ligament – medial epikondyle-bellow the medial condyle od tibia

flat long ligament fused with joint capsule and medial menisc

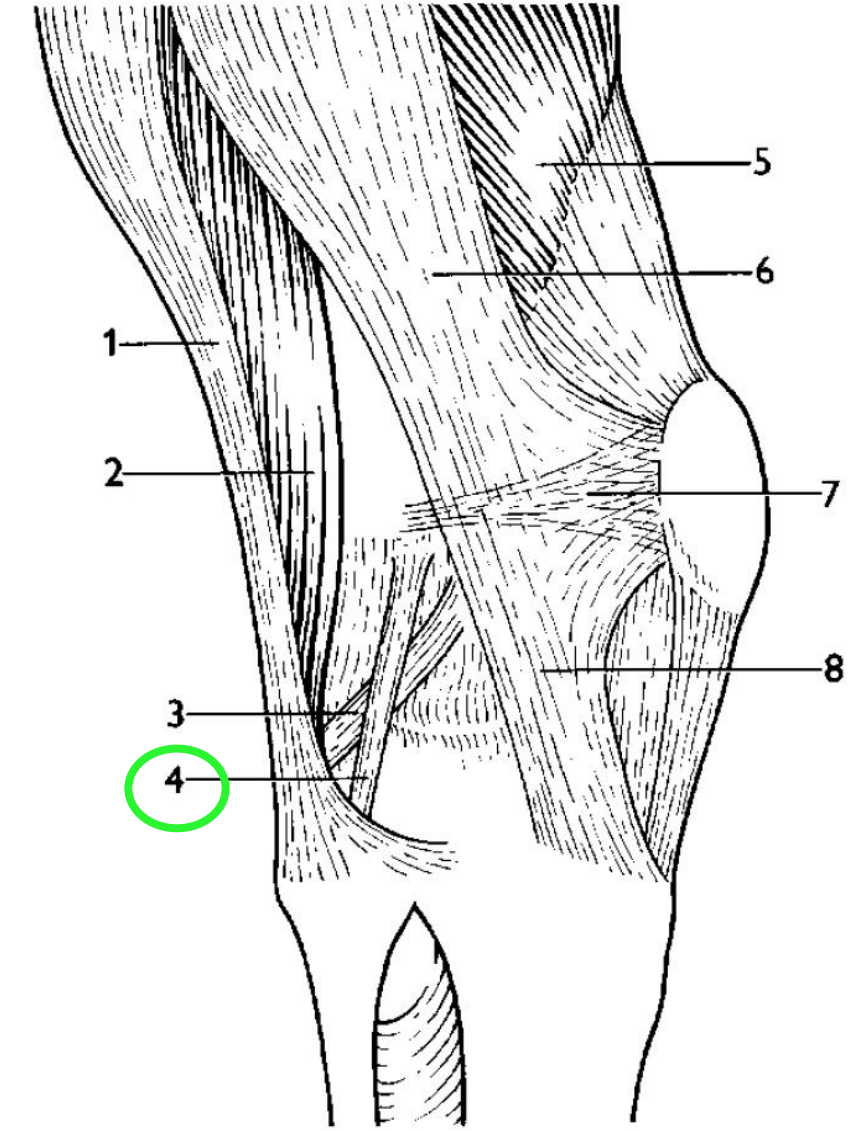


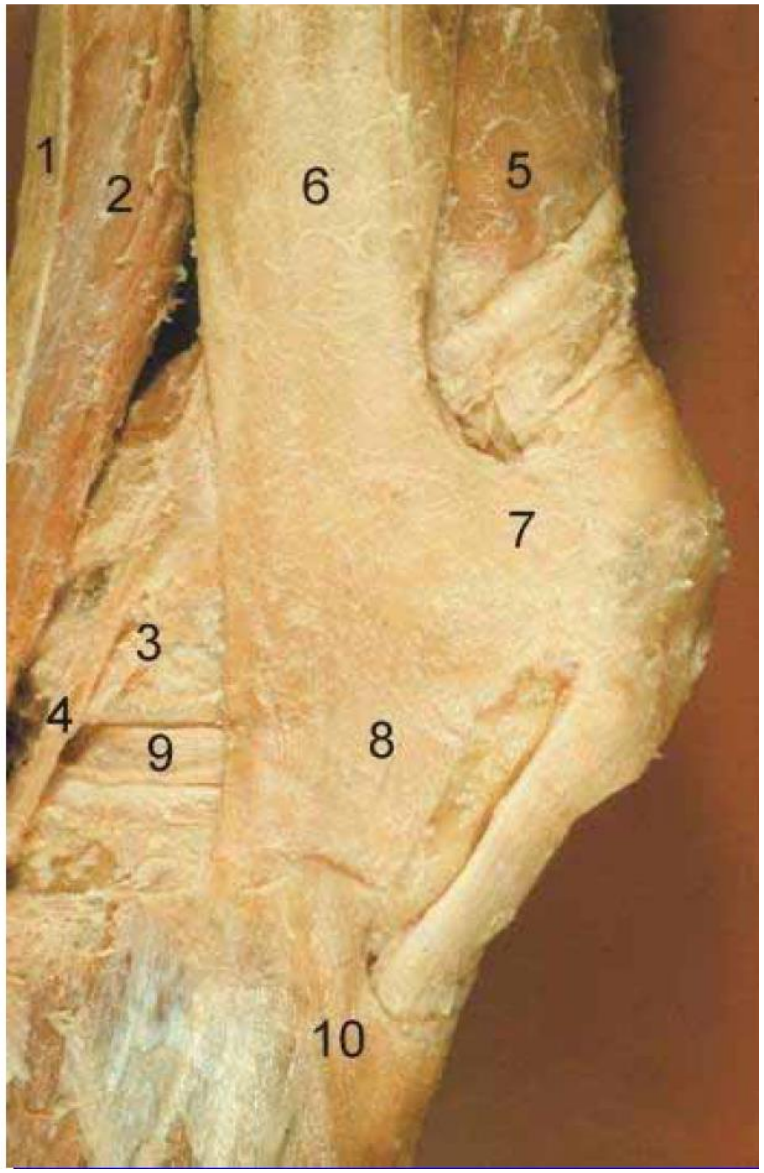
1- m. vastus medialis
2,5- retinacula patellae
3, 13- joint capsule
4- patellar ligament
7- m.adductor magnus
9-medial epikondyle
10- m. gastrocnemius medialis

Lateral collaleral ligament – short rounded ligament laterally from m.popliteus tendon (far from joint capsule)

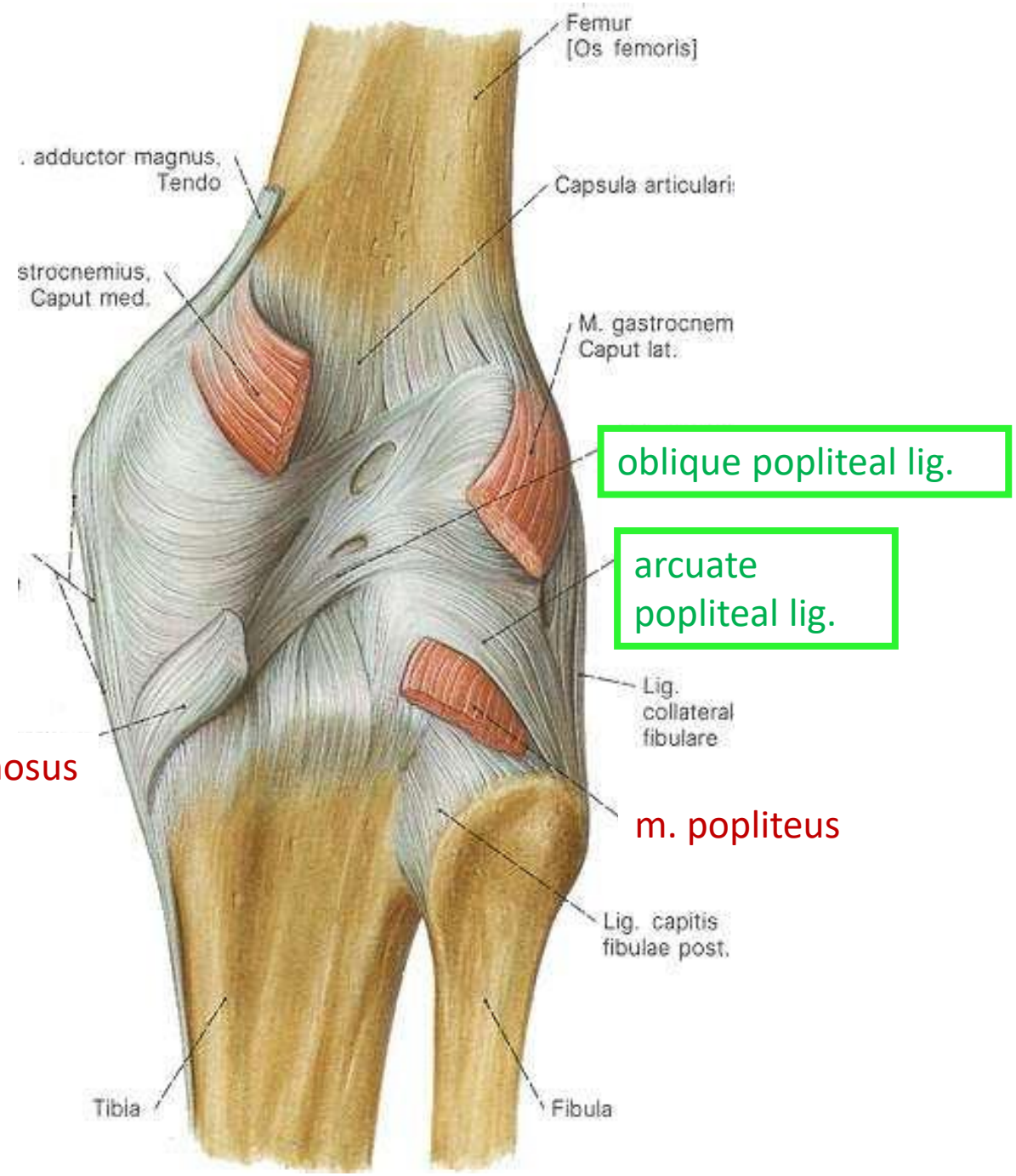
Lateral epicondyle-head of fibula

1,2-m. biceps femoris, 3-popliteus tendon, 5-vastus lateralis, 6,8-iliotibial tract, 7-retinaculum patellae laterale





Posterior capsular ligaments



m. semimembranosus
tendon

Movements in the knee joint

Flexion + extension

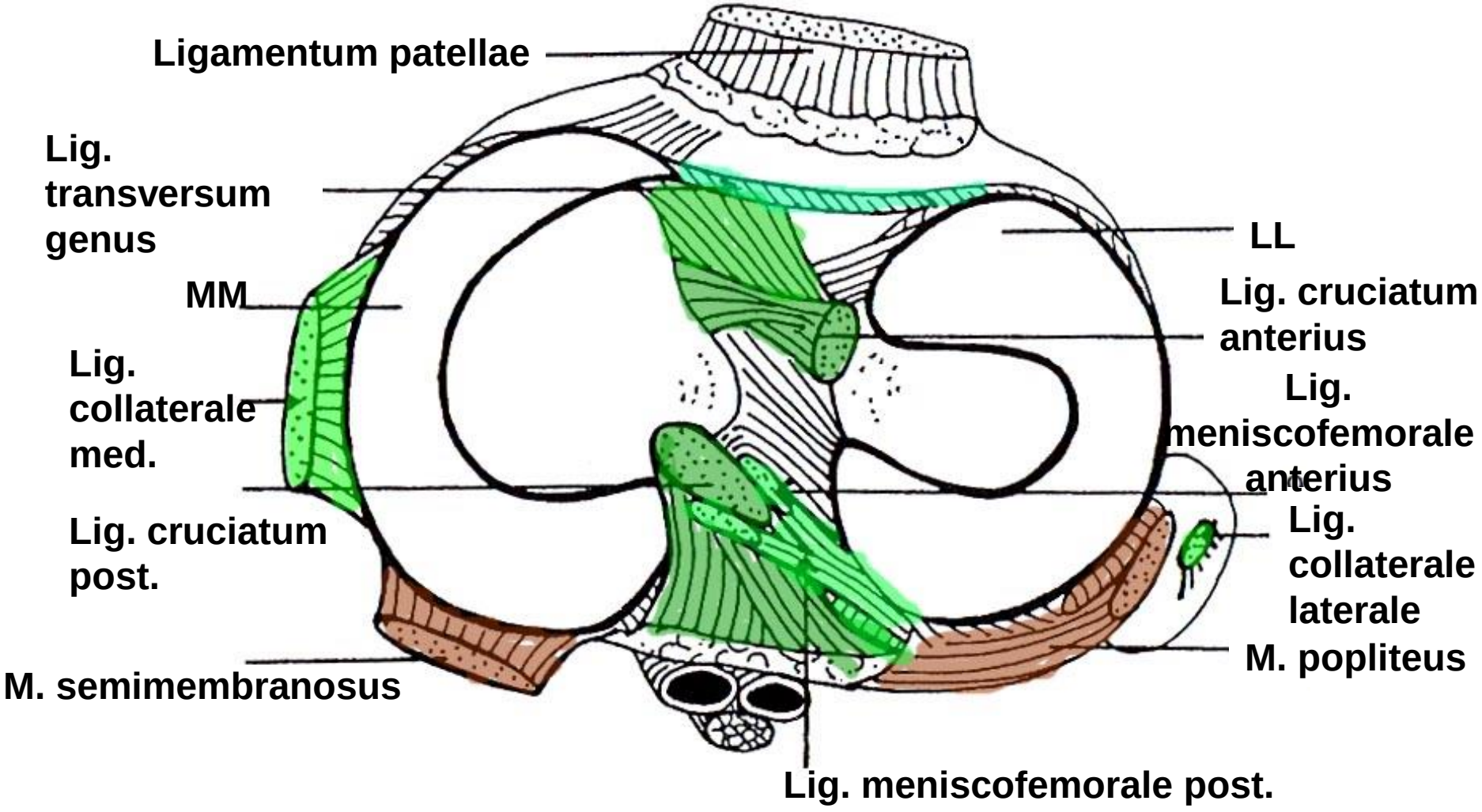
From the extension

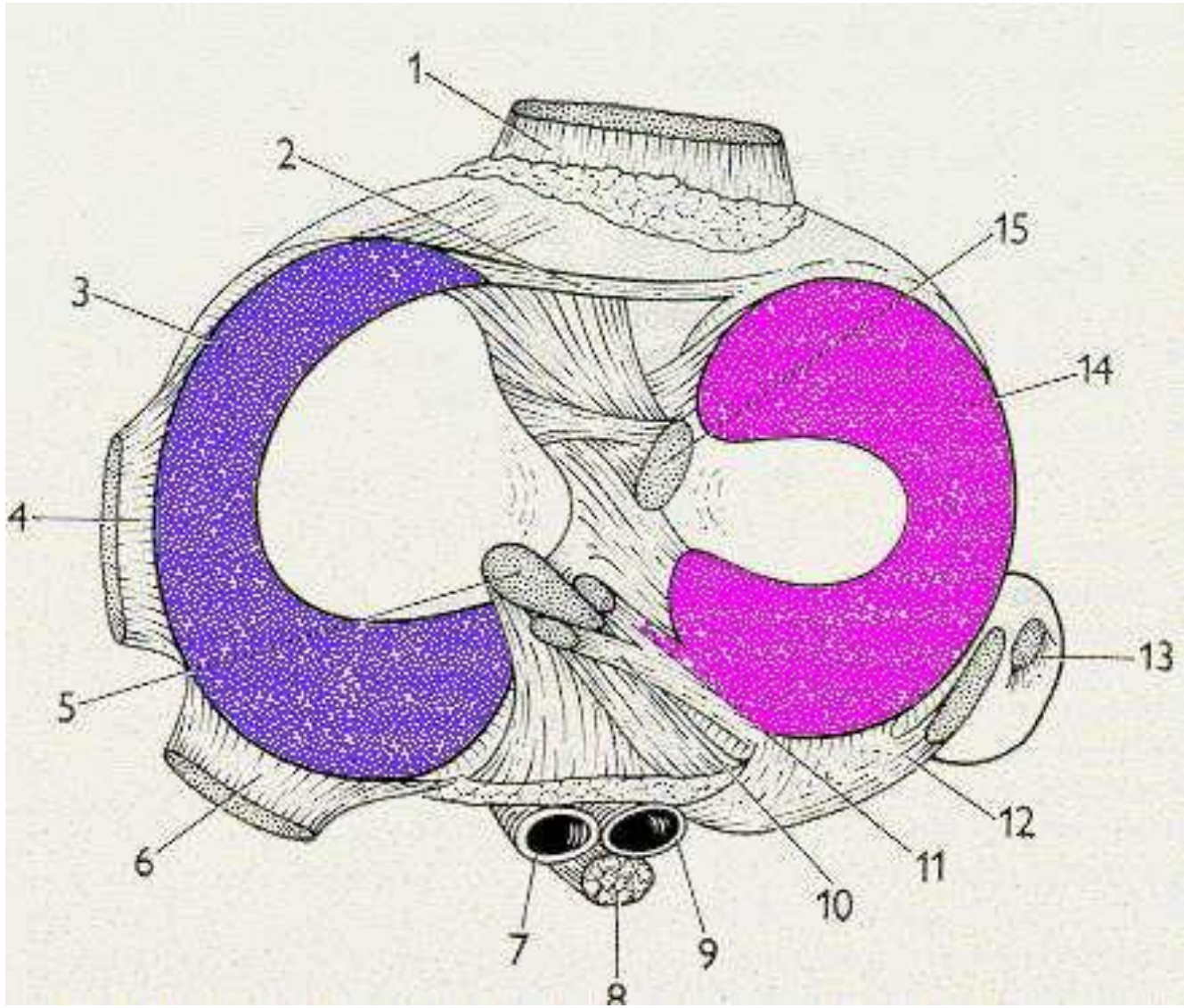
1) Inicial rotation – unlocking of the knee 5-10 degree of inner rotation of the tibia
2) Rolling movement in menisco-femoral joint
3) Gliding movement of femoral condyles and meniscs on the tibial superior articular surface

Rotation possible in flected knee

Midposition – flexion 30 degree

Transverse section of the knee joint – superior aspect




1
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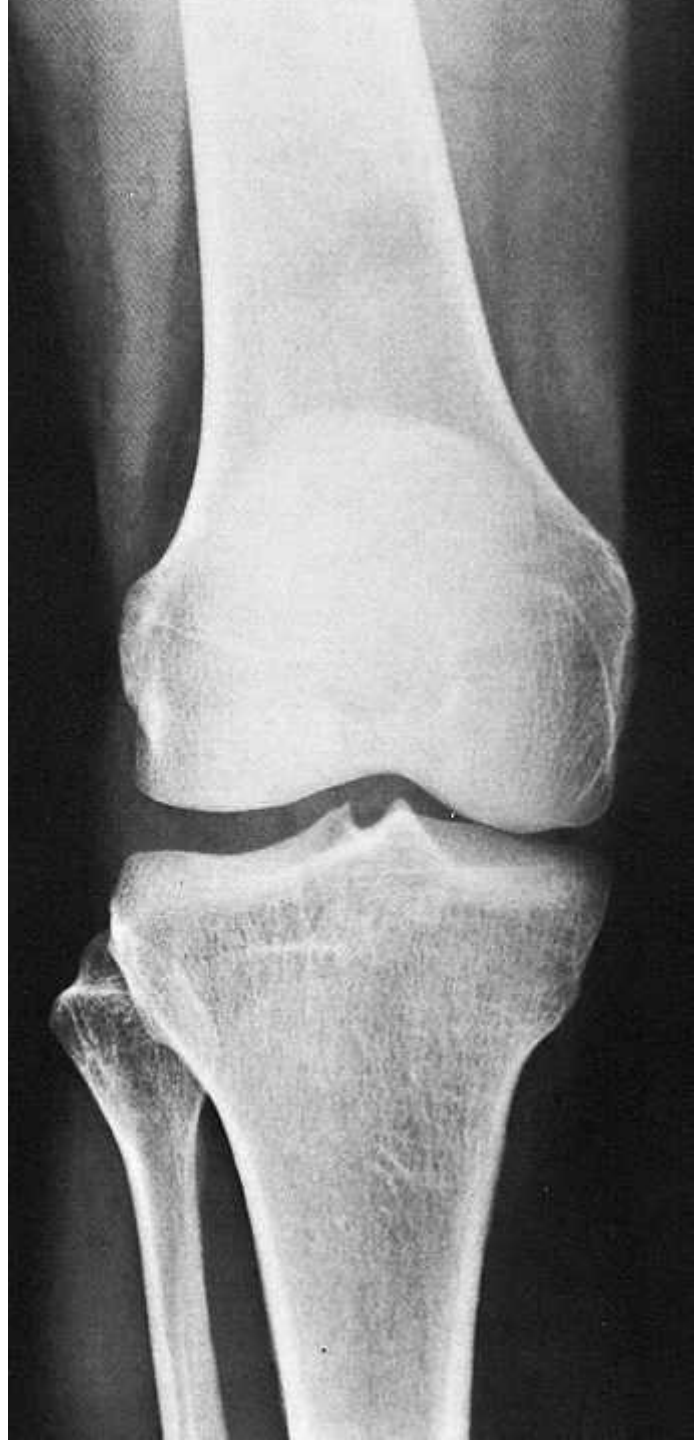
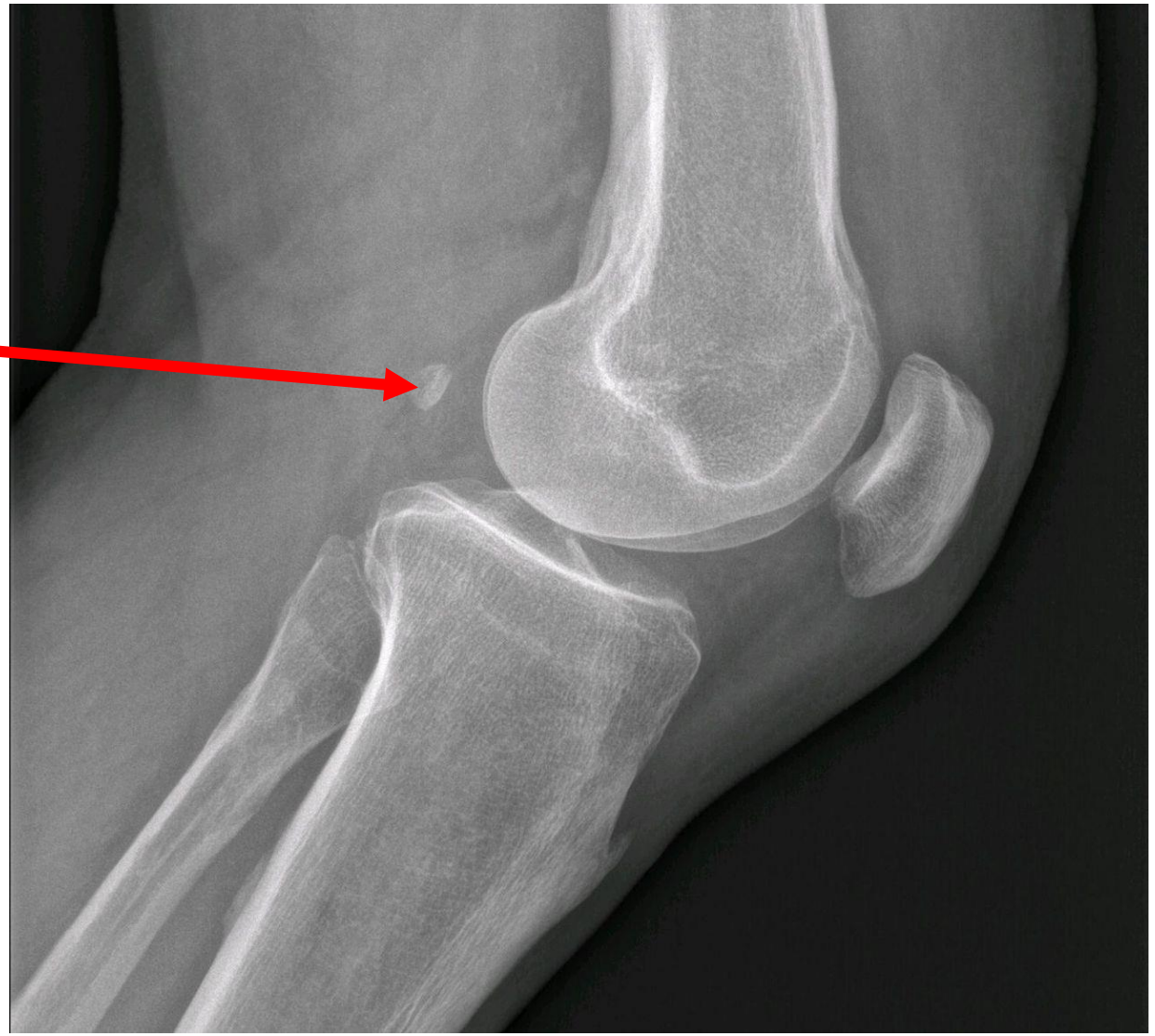


Fabella

Sesamoid bone embedded in the tendon of the lateral head of the gastrocnemius muscle behind the lateral condyle of the femur



https://radiopaedia.org/articles/fabella

Joint capsule filled by air

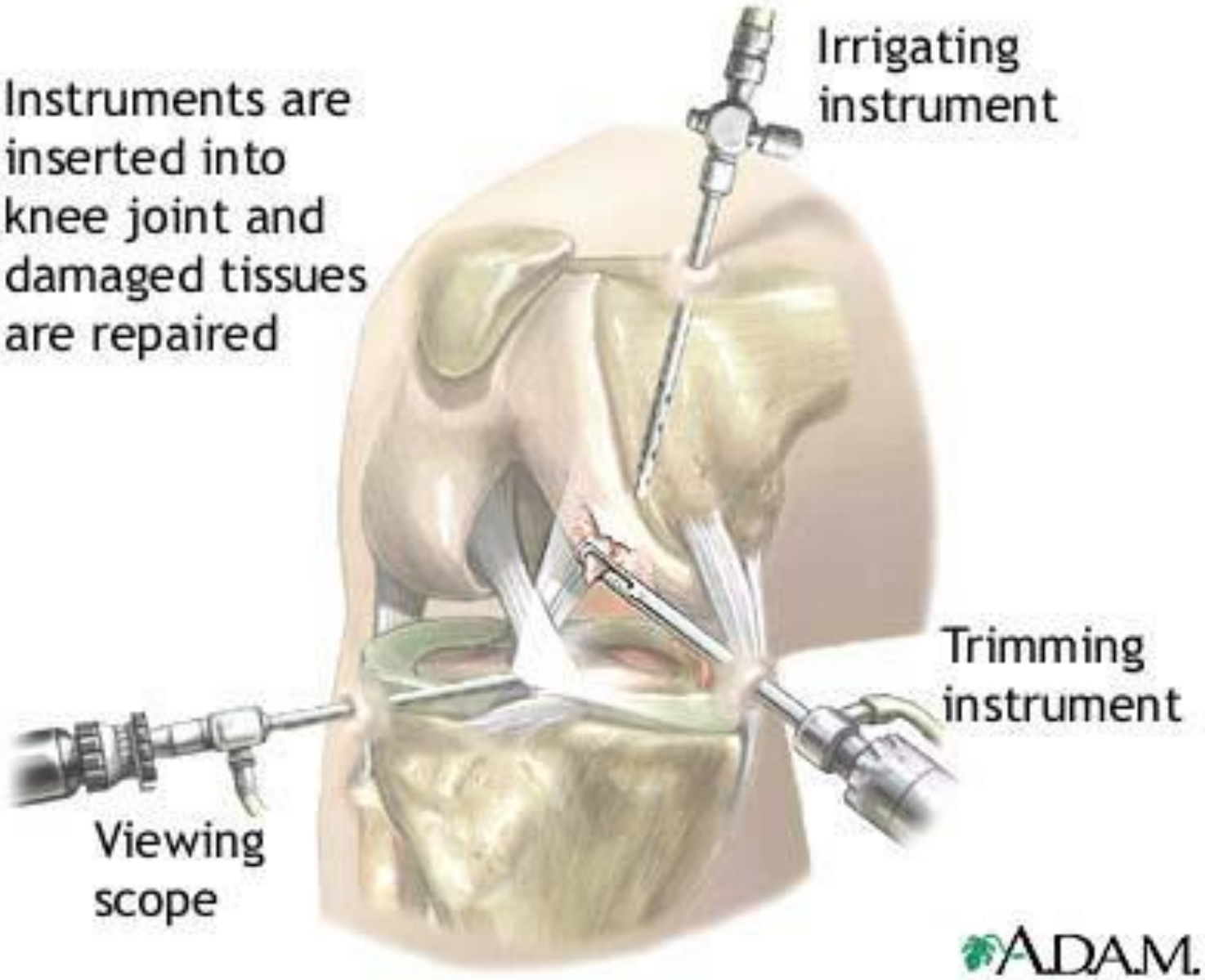
Knee replacement

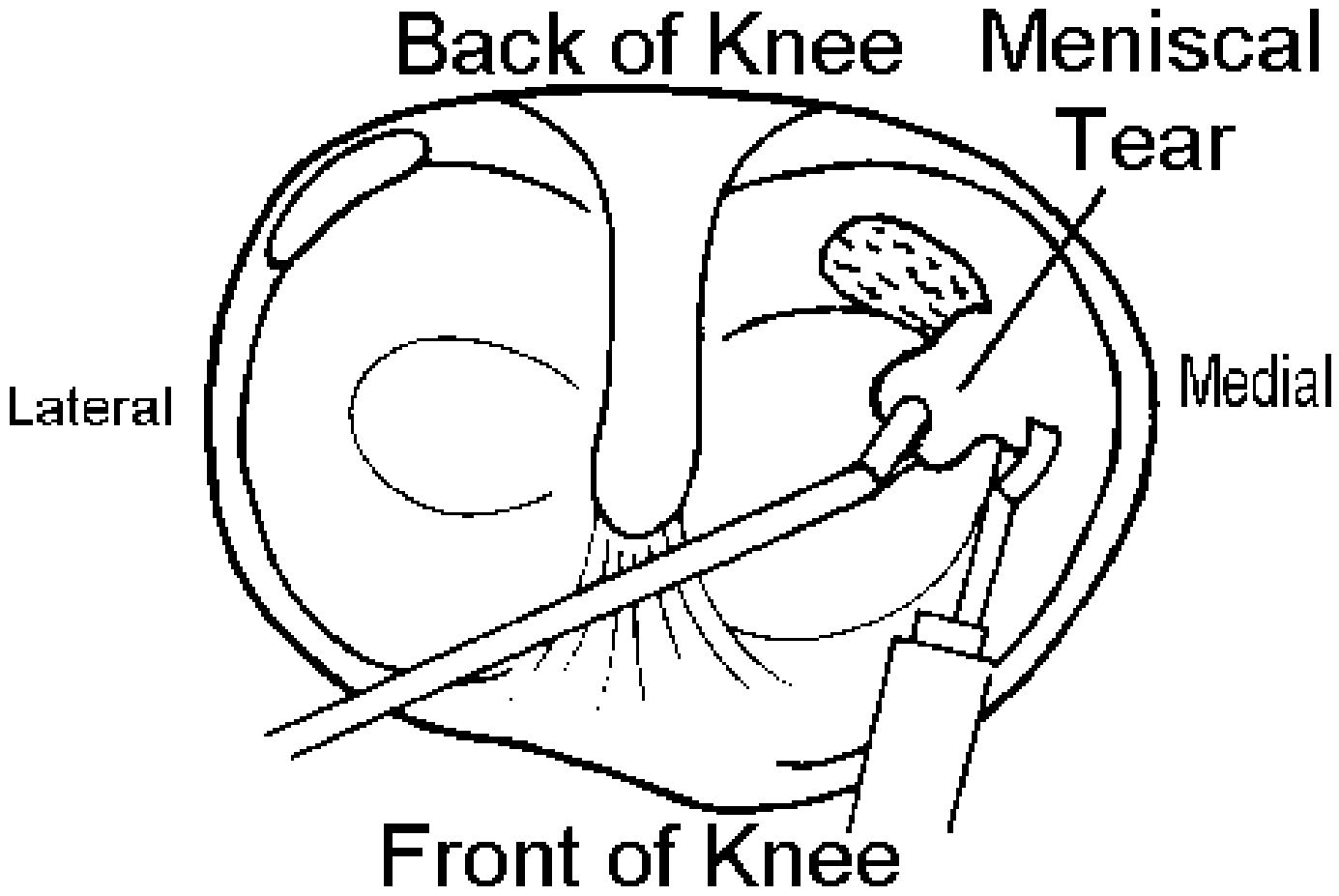
osteoarthrosis

A.D.A.M.

Knee endoprosthesis

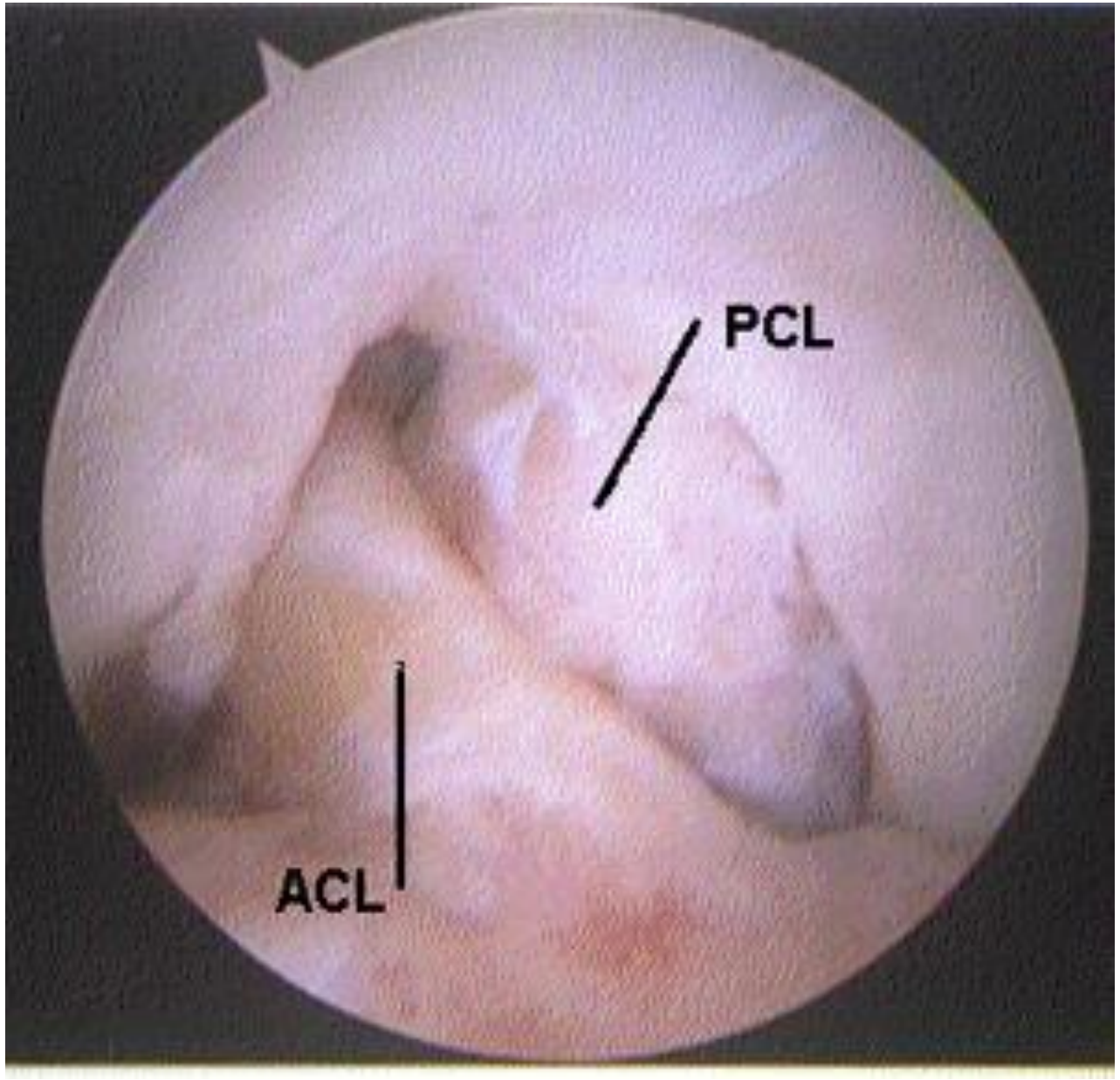
Arthroscopy




Back of Knee
Meniscal Tear
Lateral
Medial
Front of Knee

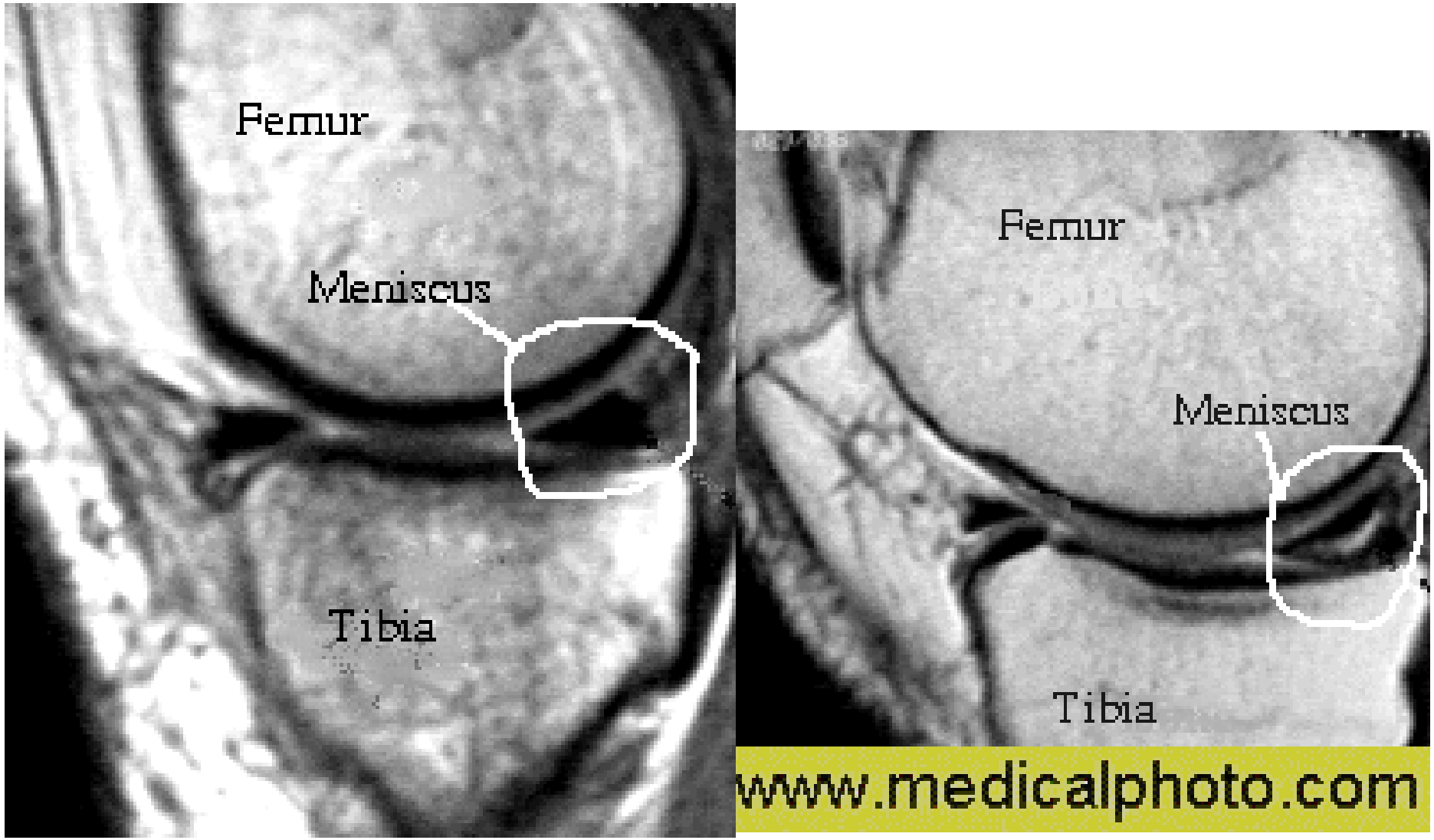
Ligg. Cruciata

Arthroscopic aspect

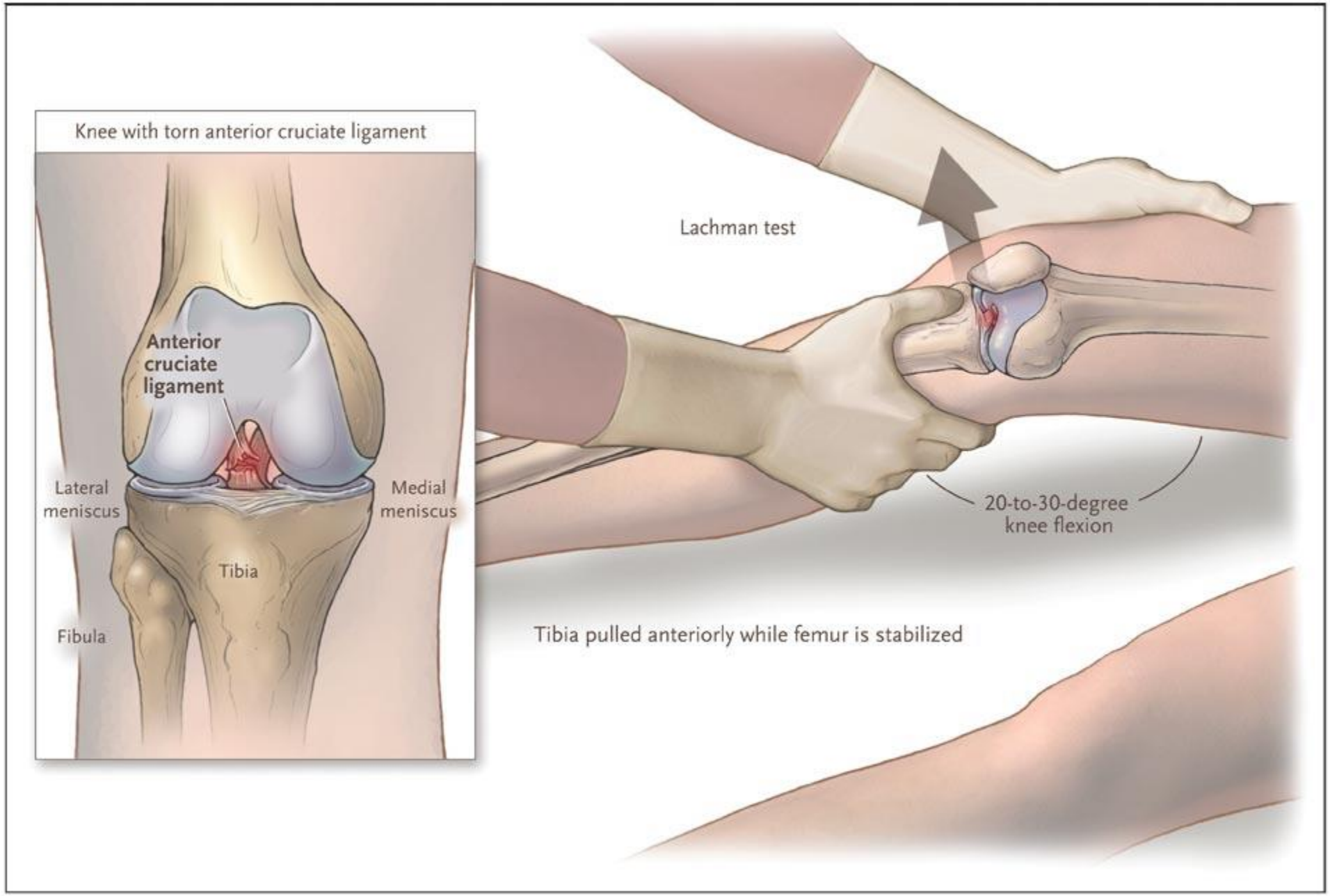


Patient's primary complaint was persistent joint effusion. Complete tear of posterior cruciate ligament. Knee effusion

- There is a full thickness tear of the posterior cruciate ligament.
- There is joint effusion involving primarily the suprapatellar space.



Meniscus tear


Knee with torn anterior cruciate ligament
Anterior cruciate ligament
Lateral meniscus
Medial meniscus
Tibia
Fibula
Lachman test
20-to-30-degree knee flexion
Tibia pulled anteriorly while femur is stabilized

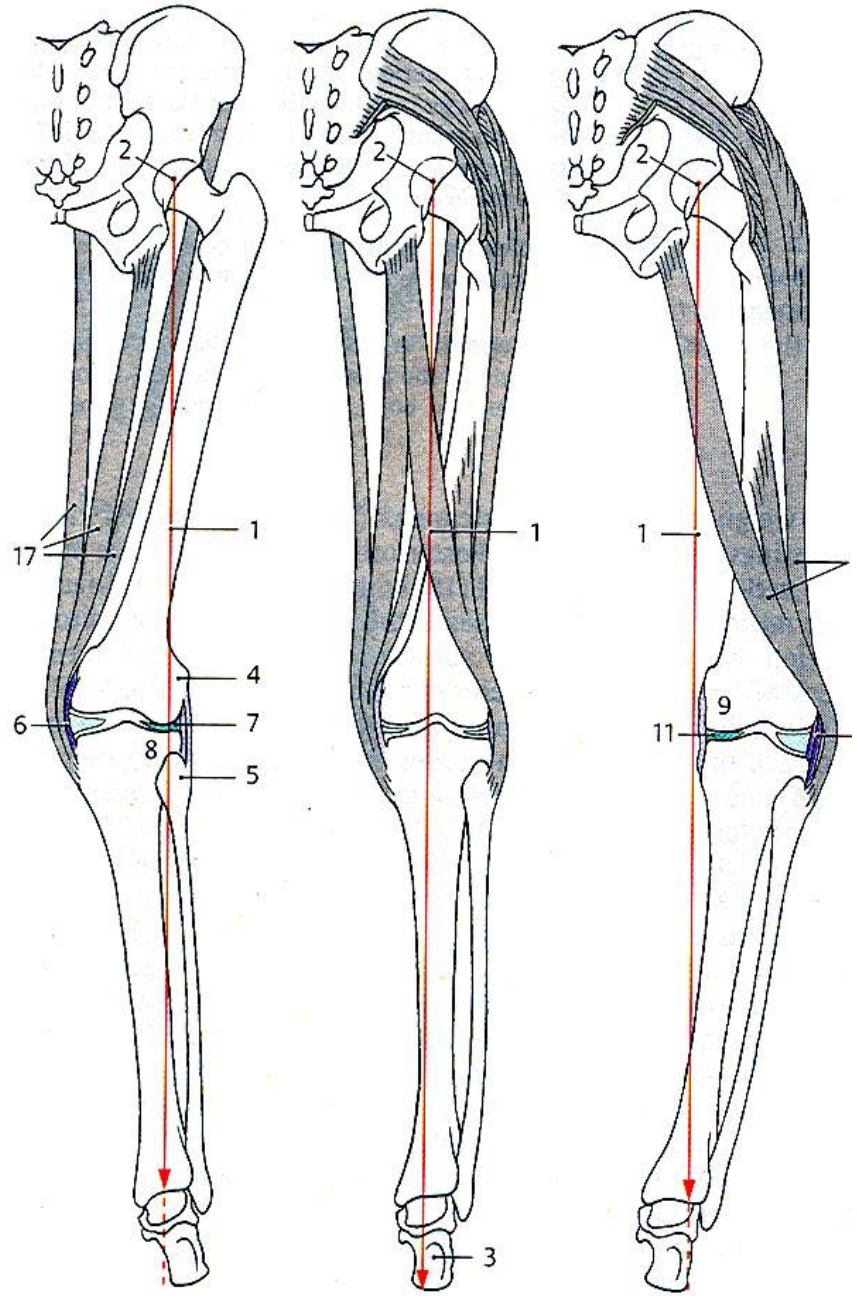
Anterior cruciate ligament injury

Blow to the outside of the knee
(somtimes unhappy or unholy triad – ACL, MCL, M menisc)

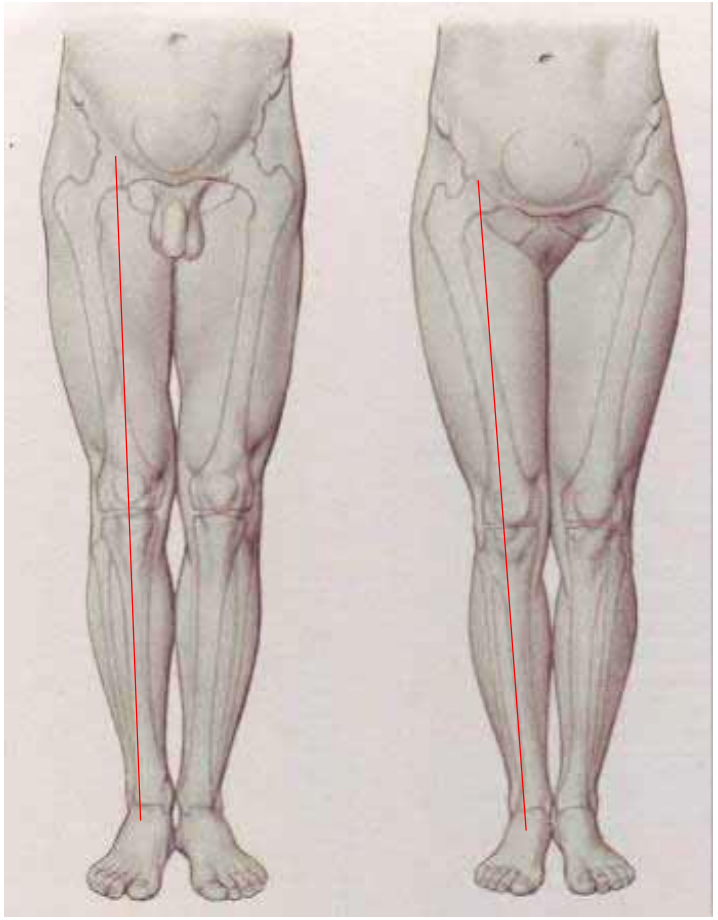
Fig 3. Non-contact ACL injuries occur when rotation occurs in the knee joint with a fixed weight-bearing foot.

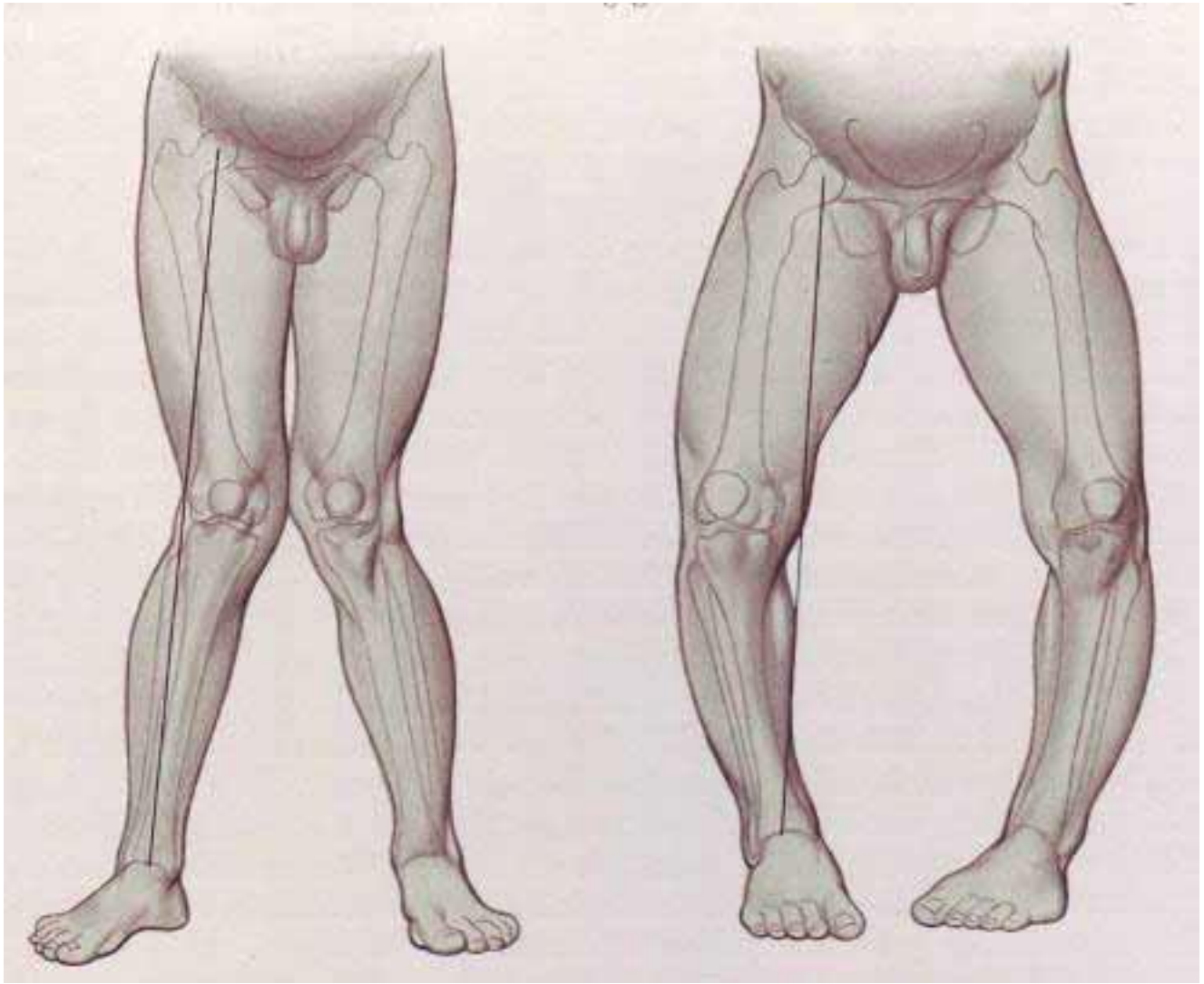
Quick deceleration, hyperextension or rotational injury that usually does not involve contact with another individual

http://www.beantownphysio.com/pt-tip/archive/acl-tears.html



B Genu valgum A Genu rectum C Genu varum



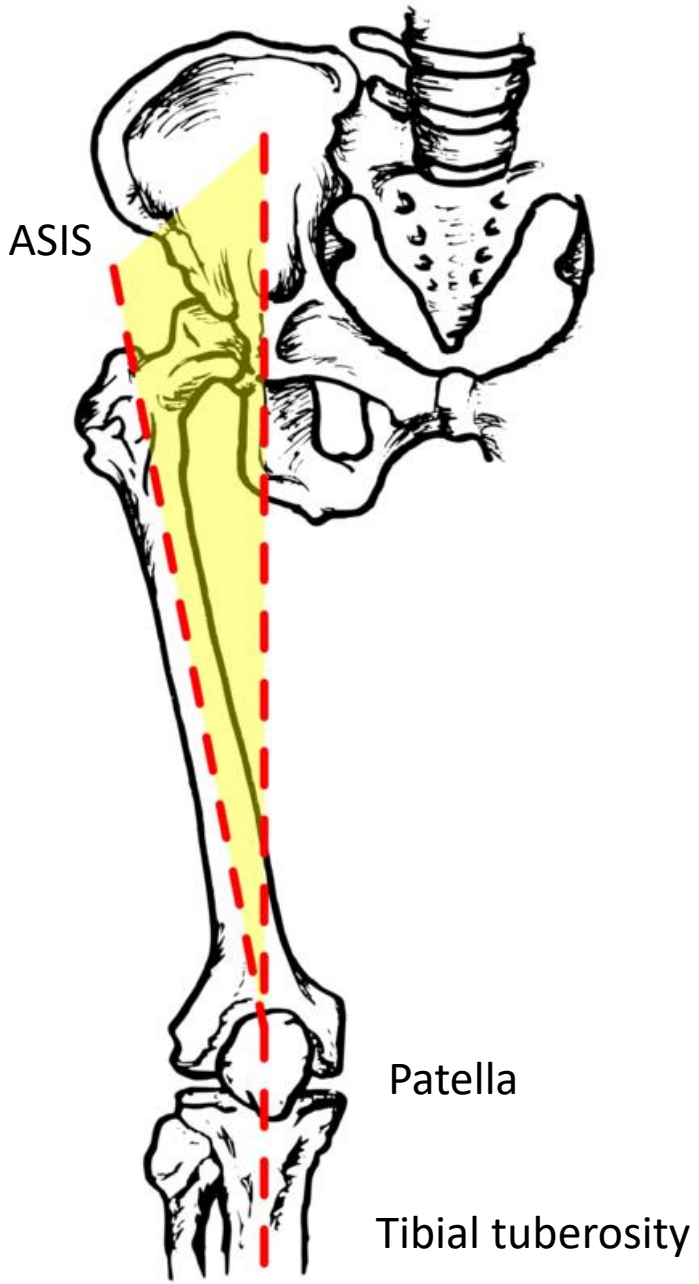


Genua valga

Genua vara

Q angle - Quadriceps angle – to 20 degree

More than 20 degree– femorpatellar syndrome – patellar dislocation



Source of the figure - wikiskripta

Proximal T-F joint- amphiarthrosis

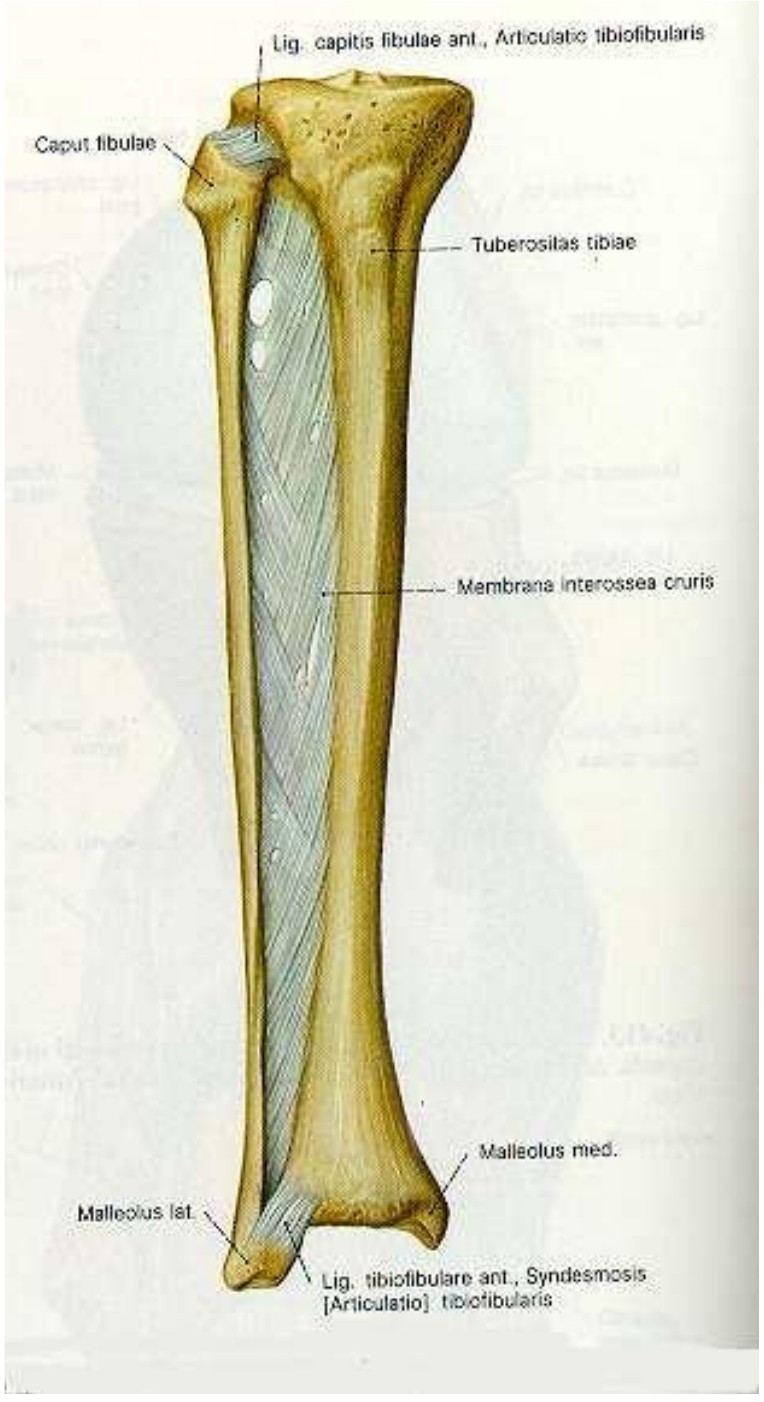
- **head of F- fib.art.facet of lat.tib.condyle**

- interosseous membrane

Dist. T-F joint = tibiofibular syndesmosis

- special kind of connection allowing minimal movement essential for proper ankle joint function

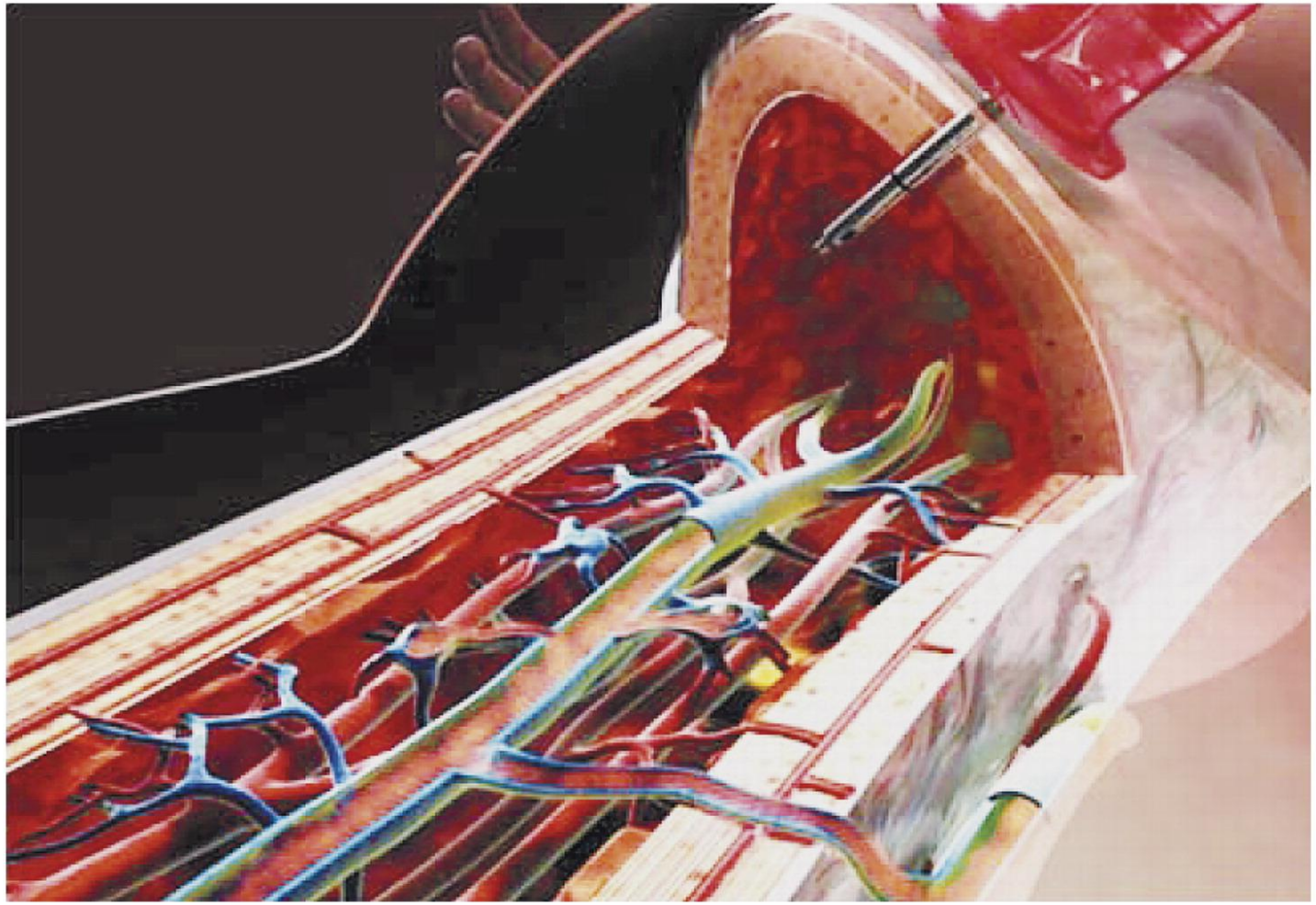
ant. + post.tibiofibular ligment



x-ray – crus of the child

Growth plates

Intraosseous needle insertion – in no intravascular access

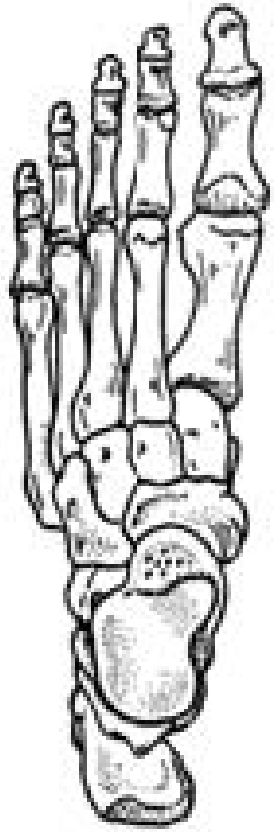


Dev SP et al. N Engl J Med 2014;370:e35.

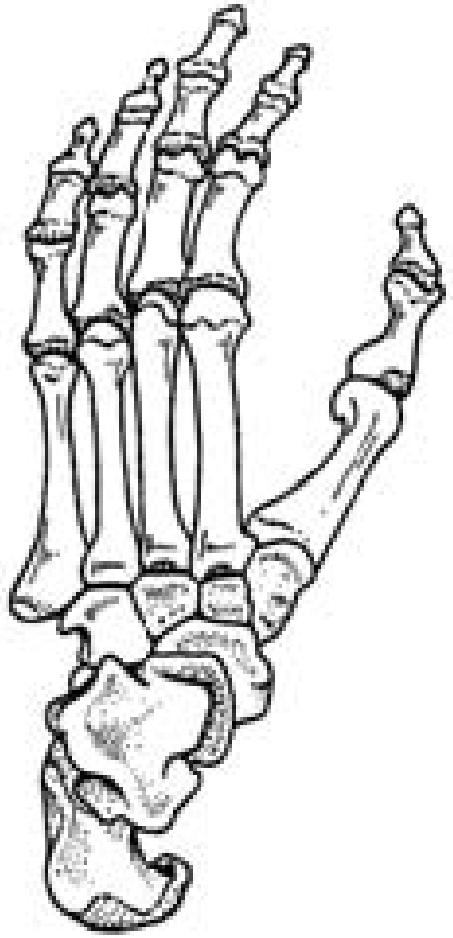
Drainage of the Medullary and Venous Sinusoids into the Central Venous Channel, with Penetration of the Intraosseous Needle into the Medullary Cavity.

FOOT

Human



Gorila



Foot joints

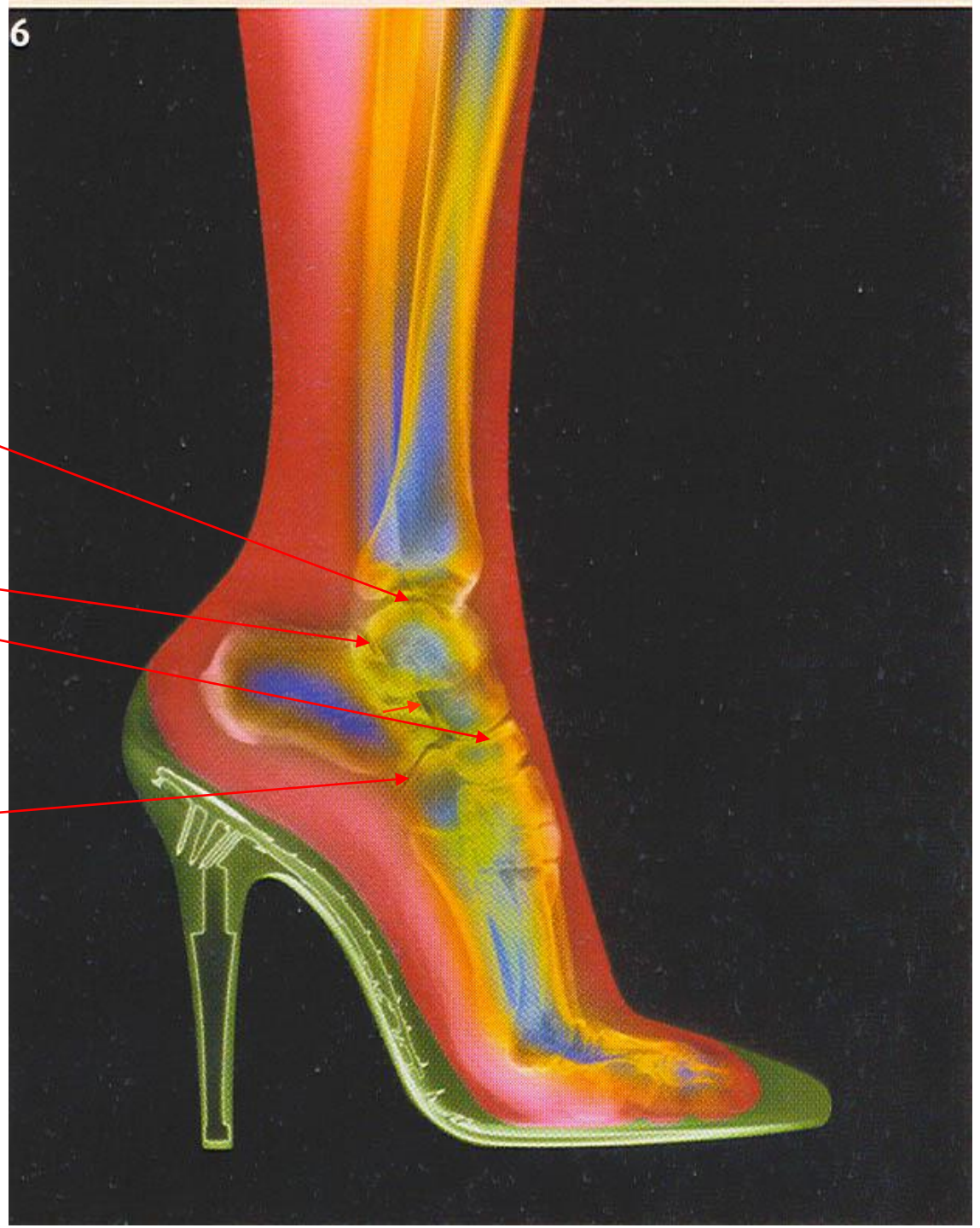
Art. talocruralis

upper ankle joint)

Art. subtalaris

Art. talocalcaneonavicularis

Art. calcaneo-cuboidea

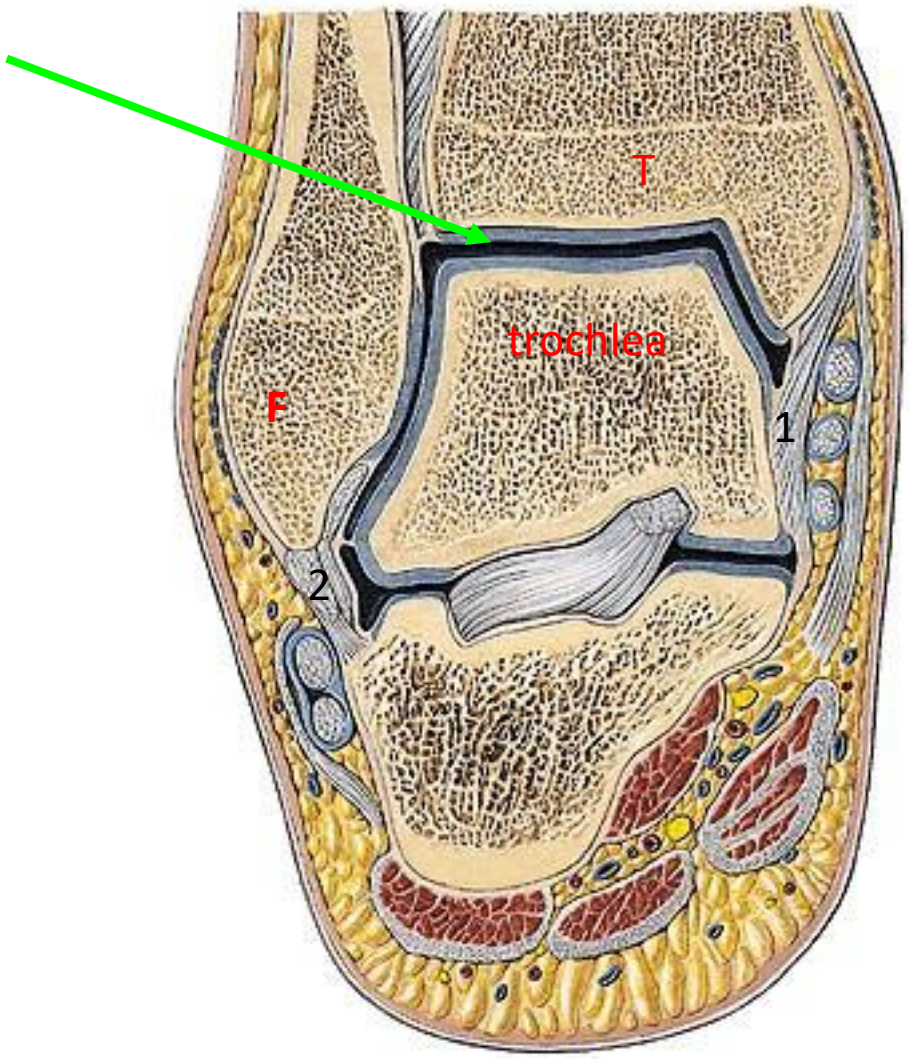


Upper ankle joint (talocrural) joint – hinge joint

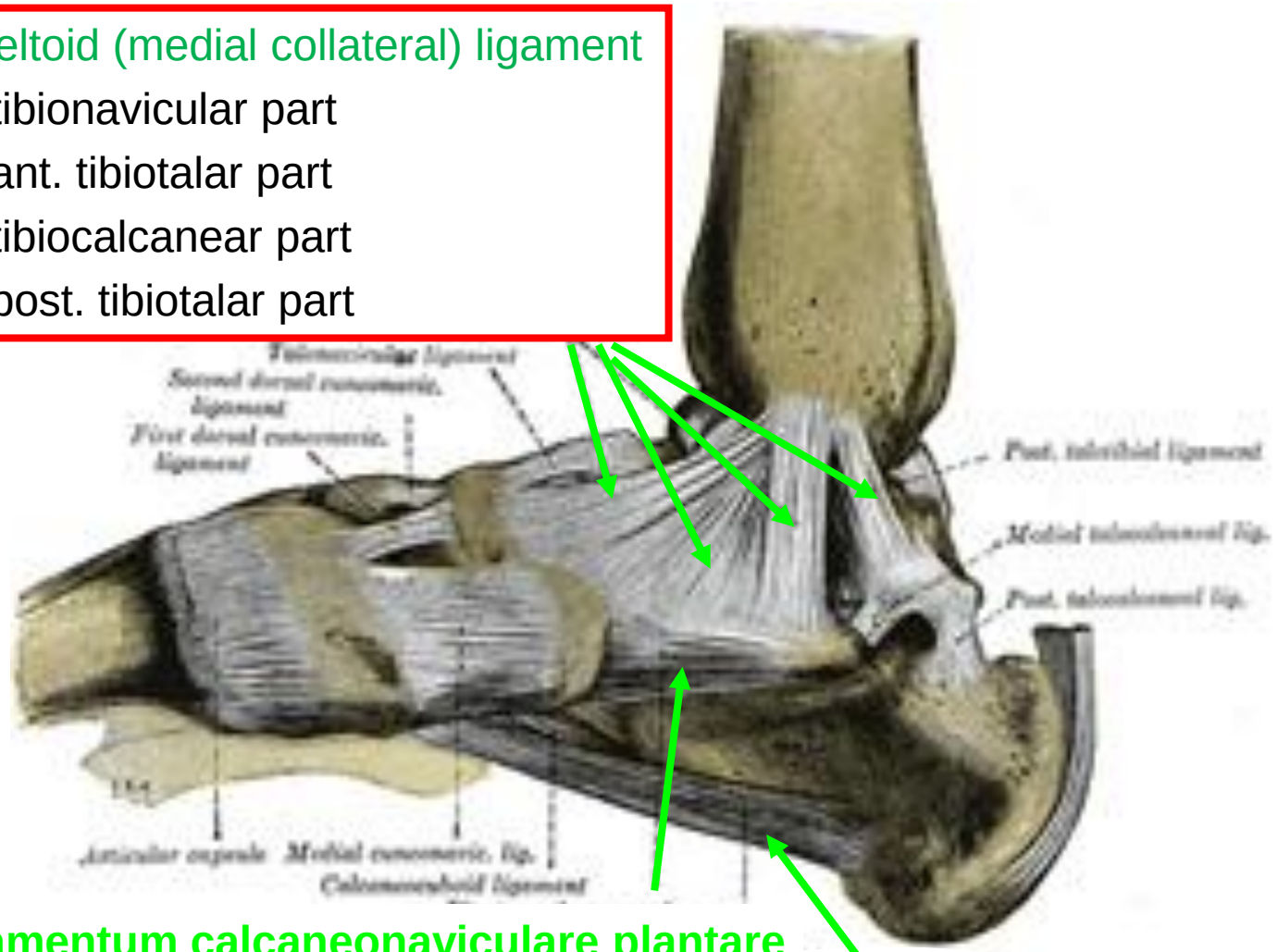
Head- trochlea (pulley) of talus
- „malleolar mortise“ (rectangular socket)

1 medial collateral ligament = deltoid lig.(4 parts)
2 lateral collateral ligament (3 parts)

movement: plant.flexion/dors. flexion

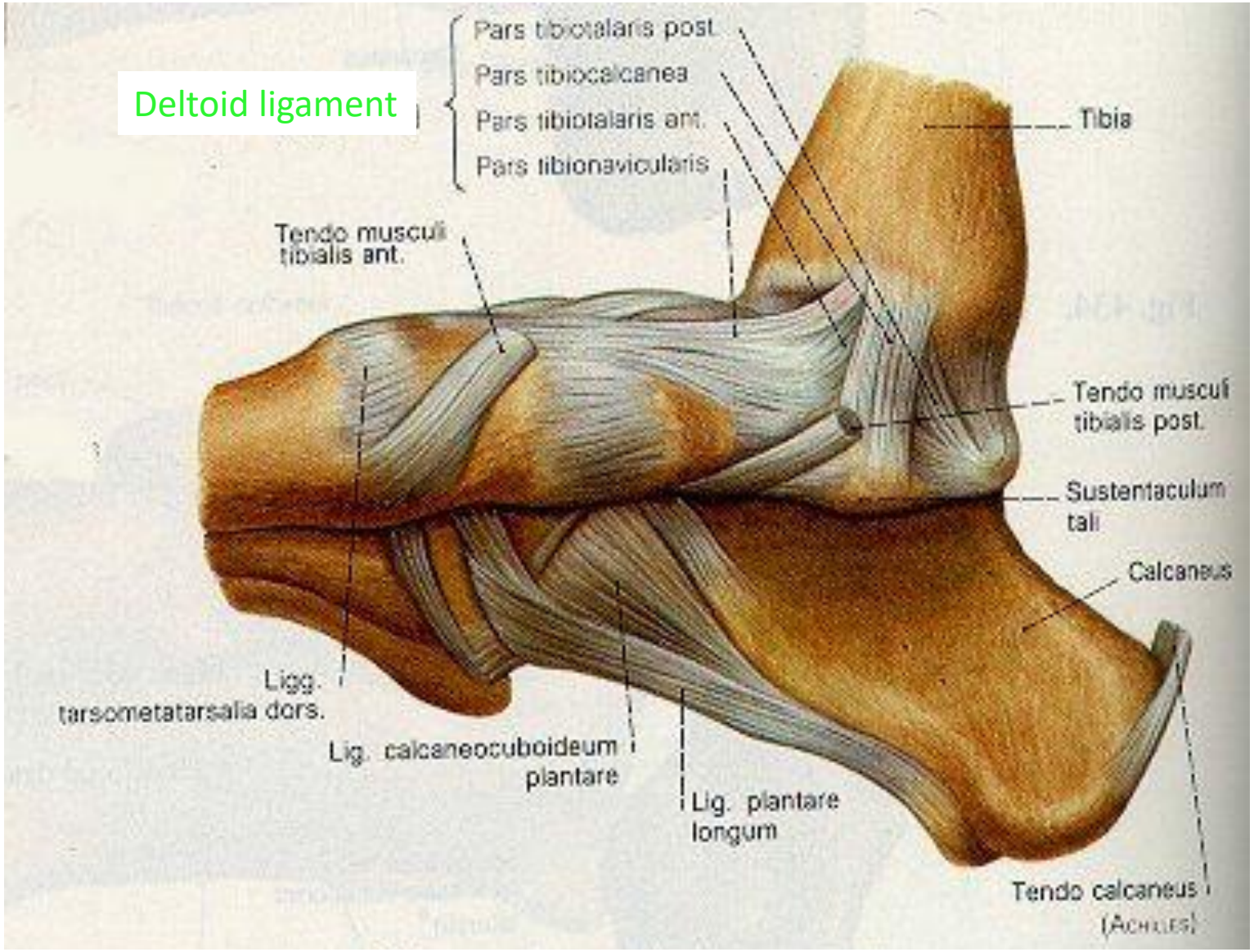


- Deltoid (medial collateral) ligament
- tibionavicular part
- ant. tibiotalar part
- tibiocalcanear part
- post. tibiotalar part

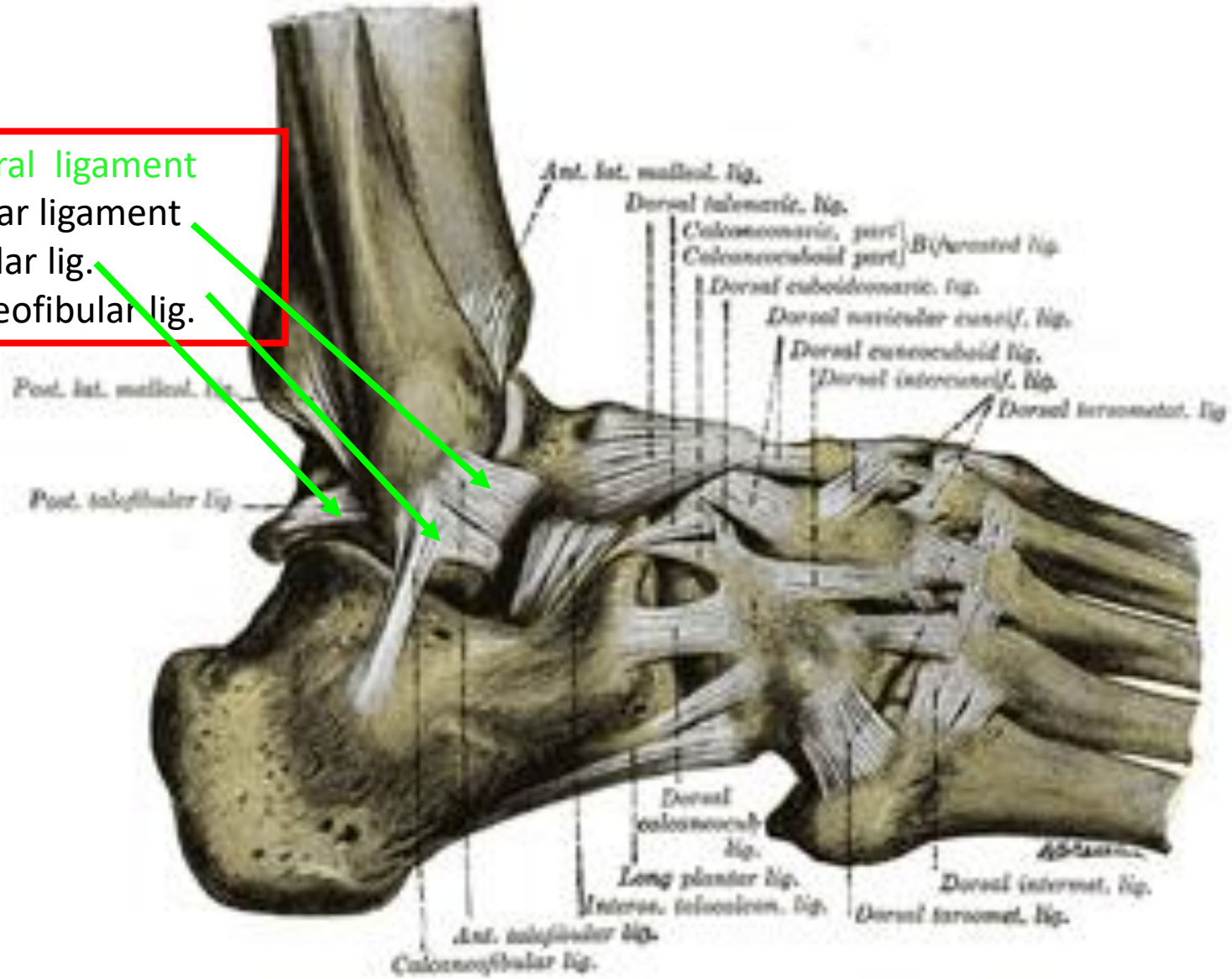


Ligamentum calcaneonaviculare plantare
„spring ligament“

Ligamentum plantare longum

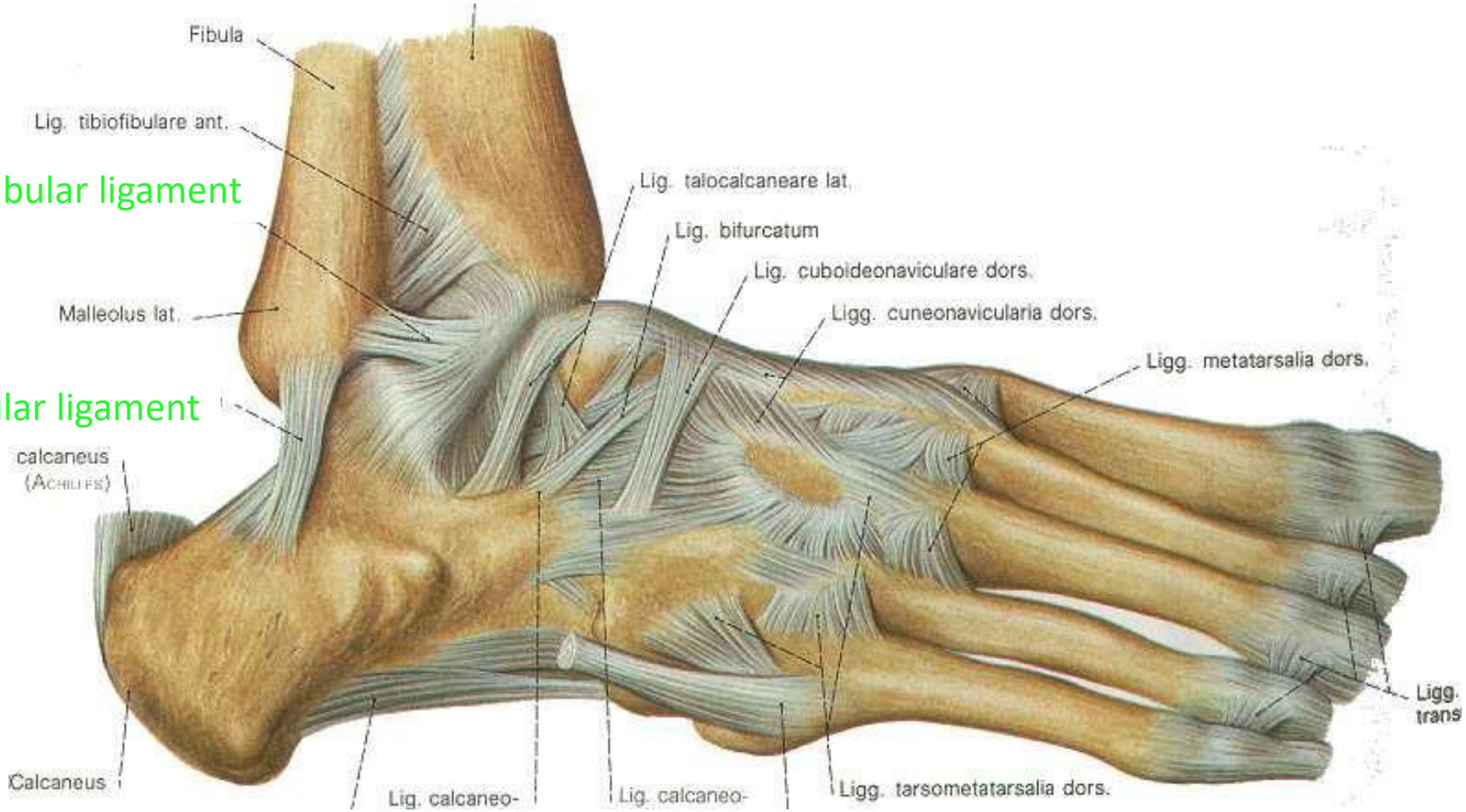

Deltoid ligament
Pars tibiotalaris post.
Pars tibiocalcanea
Pars tibiotalaris ant.
Pars tibionavicularis
Tibia
Tendo musculi tibialis ant.
Tendo musculi tibialis post.
Sustentaculum tali
Calcaneus
Ligg. tarsometatarsalia dors.
Lig. calcaneocuboideum plantare
Lig. plantare longum
Tendo calcaneus (Achilles)

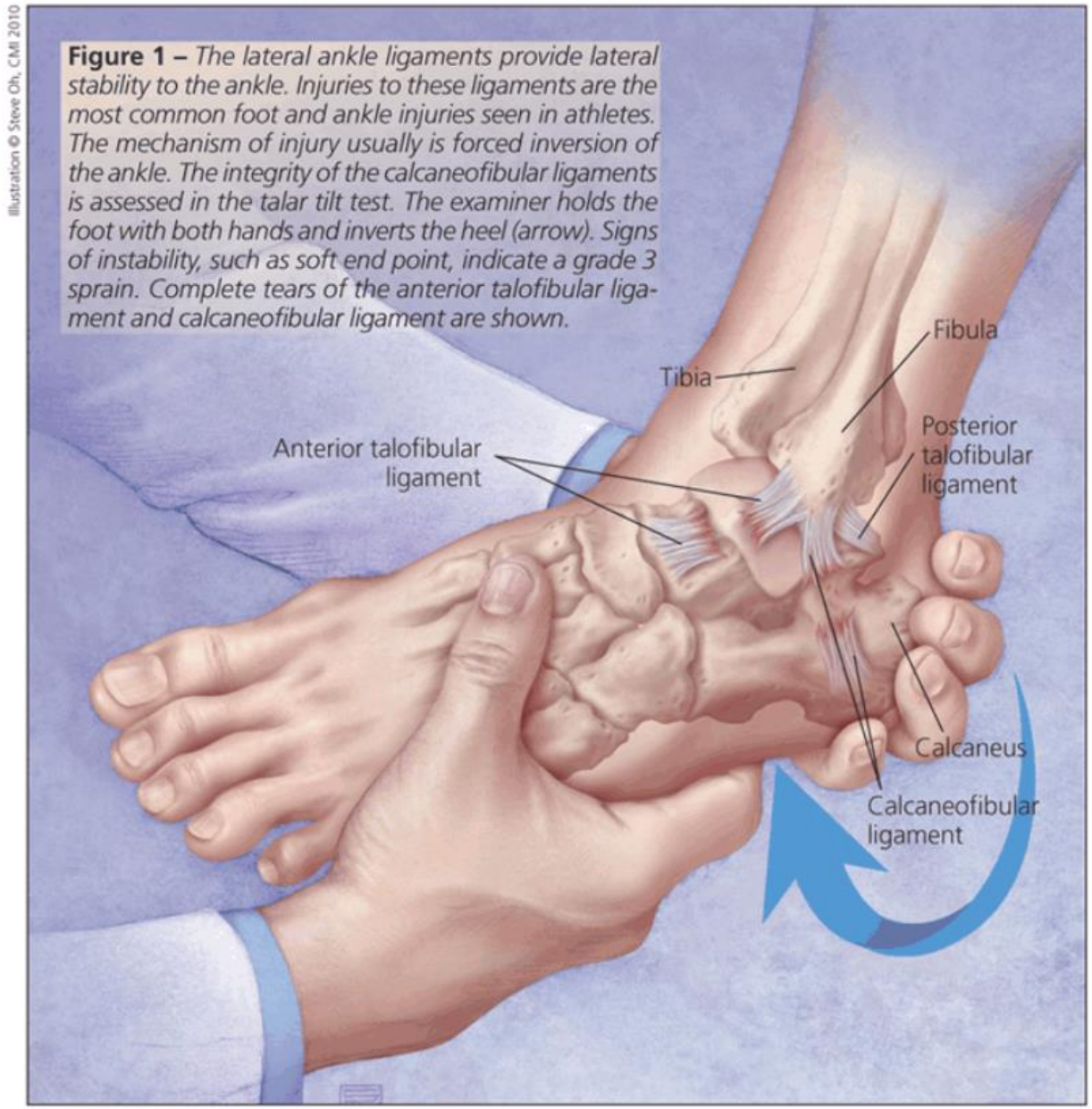
Lateral collateral ligament
- ant. talofibular ligament
-post. talofibular lig.
-calcaneofibular lig.



Anterior talofibular ligament

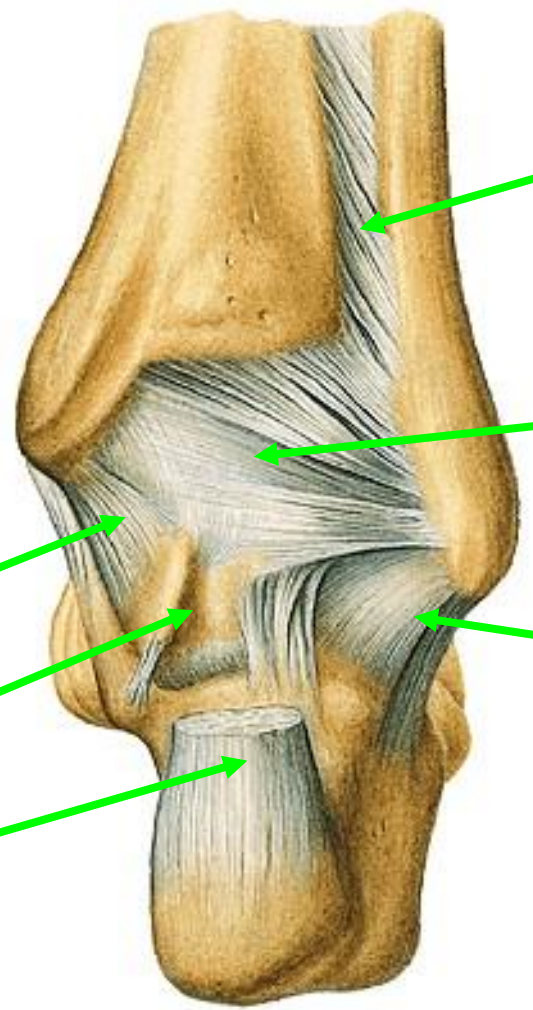
Calcaneofibular ligament





Forsed inversion – tear of lateral ankle ligaments

Posterior aspect



Interosseous membrane

Posterior tibiofibular lig

Posterior tibiotalar lig

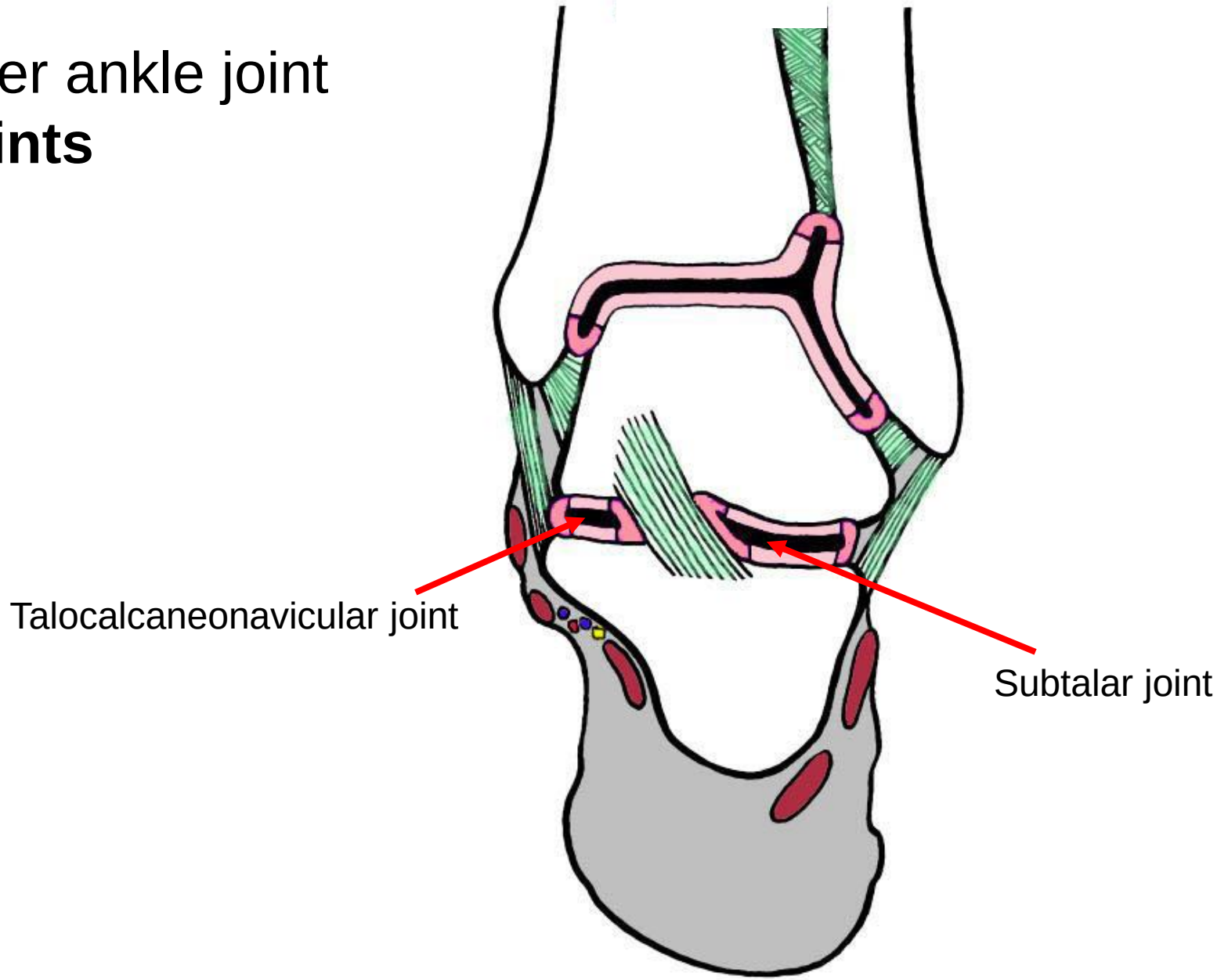
Sulcus tendinis musculi flexoris hallucis longi

Achilles tendon

Posterior talofibular lig

Lower ankle joint

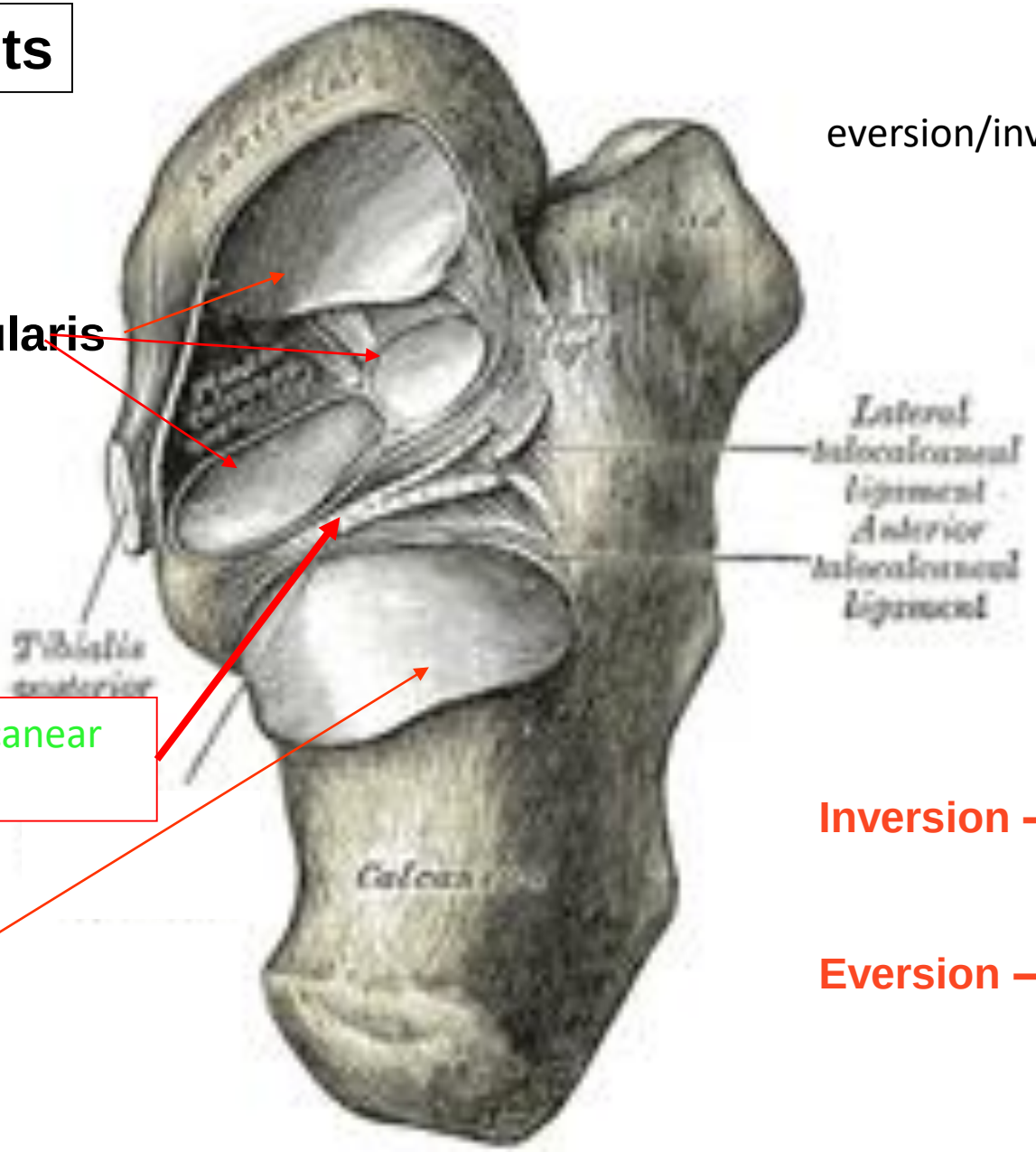
2 joints



Lower ankle joit – 2 joints

eversion/inversion of foot

1) Art. talocalcaneonavicularis



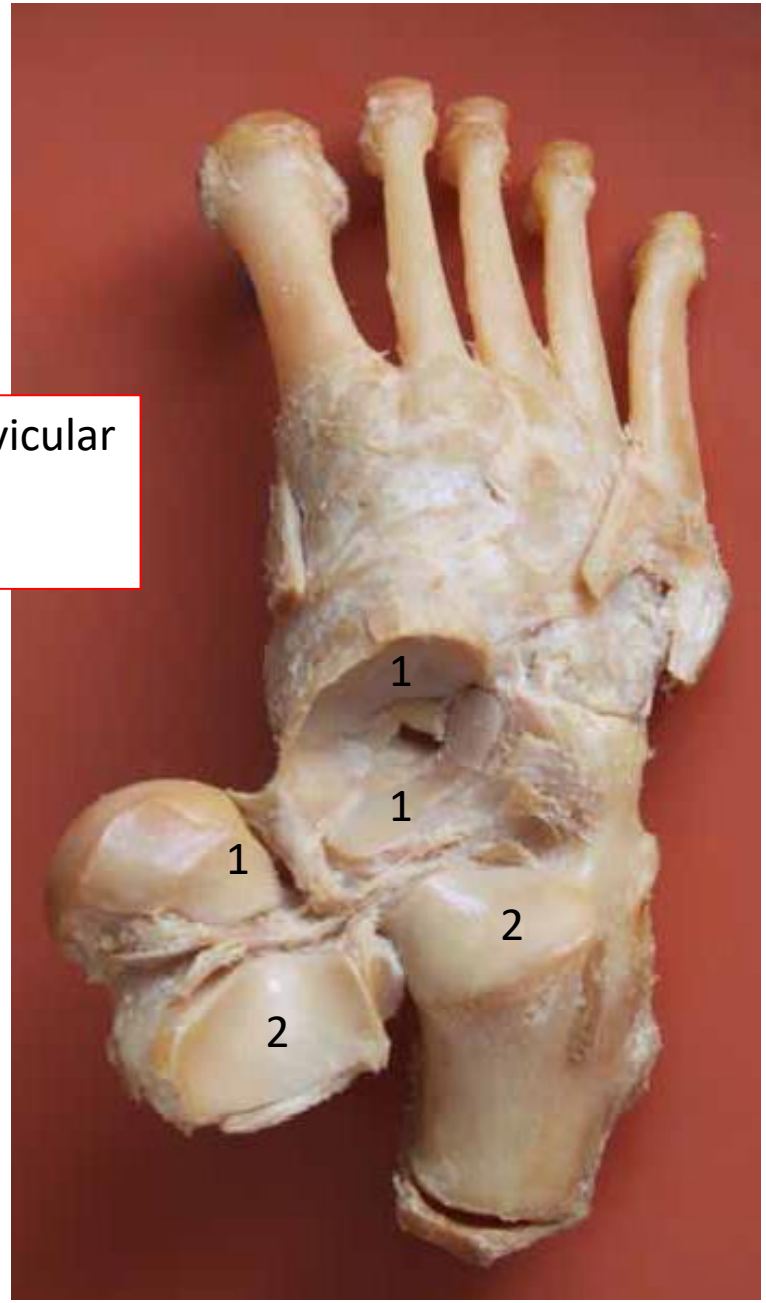
Interosseal talocalcanear ligament

2) Art. subtalaris

Inversion – plantarflexion
adduction
supination
Eversion – dorsal flexion
abduction
pronation

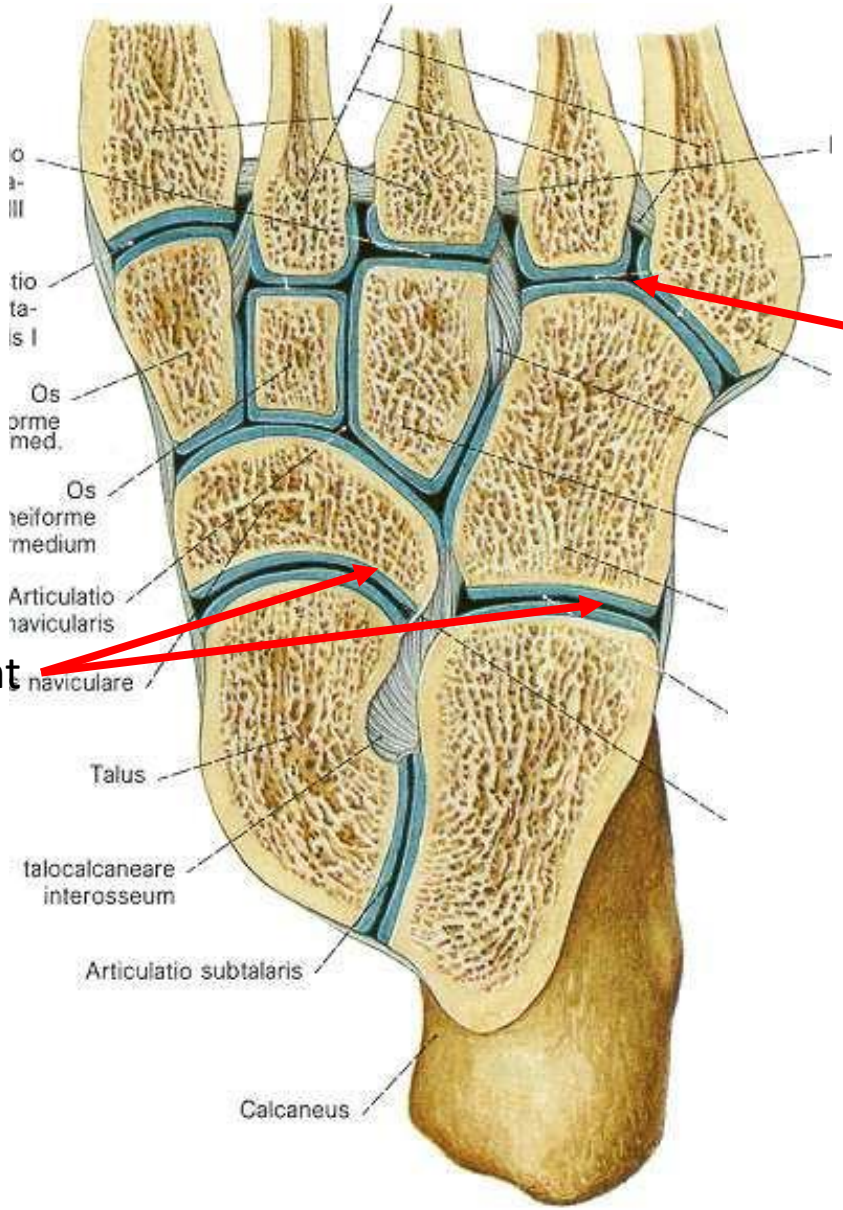
1-talocalcaneonavicular

2- subtalar



Crossection of the foot

Chopart and Lisfrank´s joint



Lisfranc´s joint
Tarso-metatarsal joint

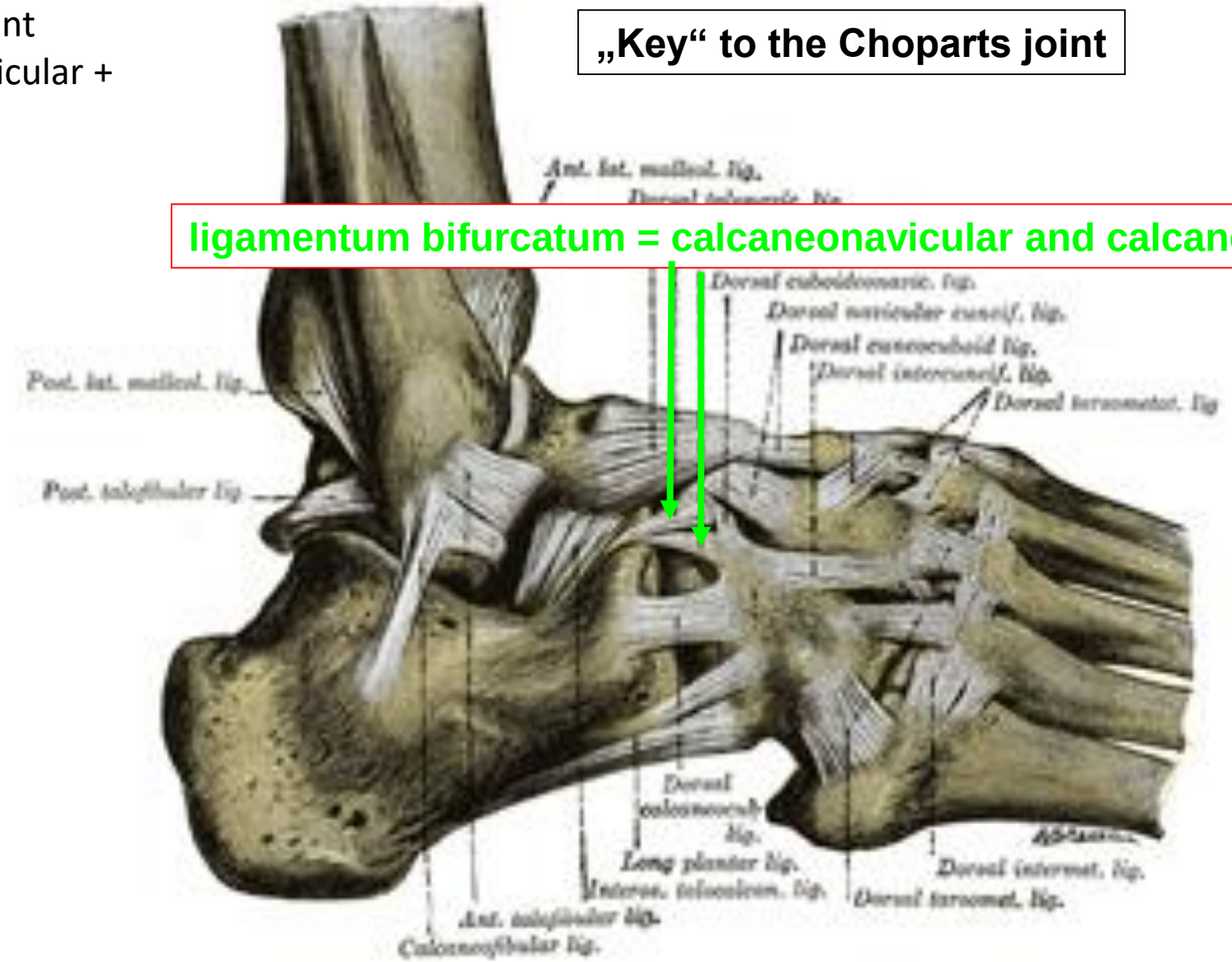
Chopart´s joint

Transverse tarsal join
2 joint cavities
one functional unit

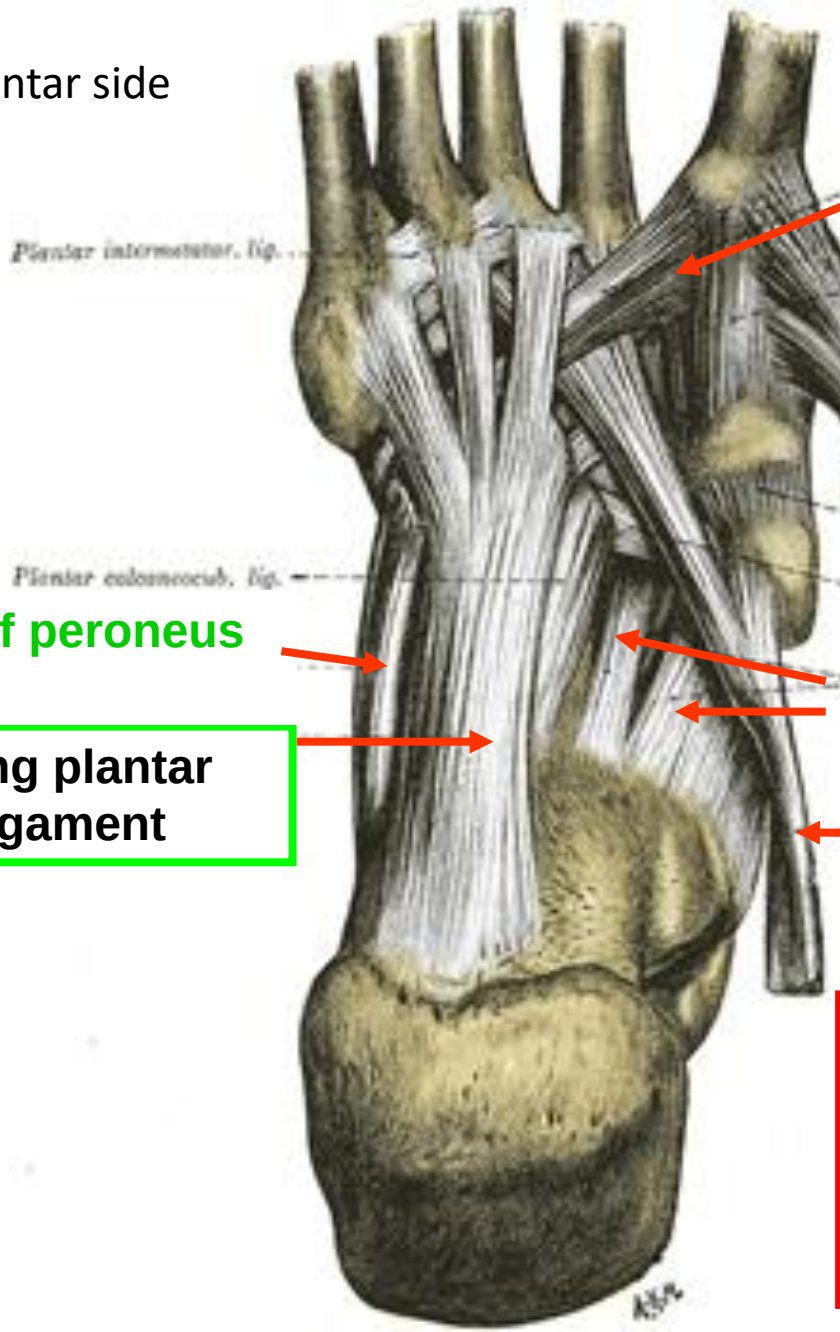
Chopart´s joint line = transverse tarsal joint complex of C-C and T-N joint
bifurcate lig. (calcaneonavicular + calcaneocuboid)

„Key“ to the Choparts joint

ligamentum bifurcatum = calcaneonavicular and calcaneocuboid part



Ligaments and tendons on plantar side



Tendon of peroneus longus

Tendon of tibialis ant.

Tendon of peroneus longus

Long plantar ligament

Plantar calcaneonavicular lig. = „spring ligament“

Tendon of tibialis post.

The plantar calcaneonavicular ligament helps to maintain the medial longitudinal arch of the foot, and by providing support to the head of the talus, bears the major portion of the body weight

Lisfrank´s ligament - lig. tarso metatersale interosseum primum

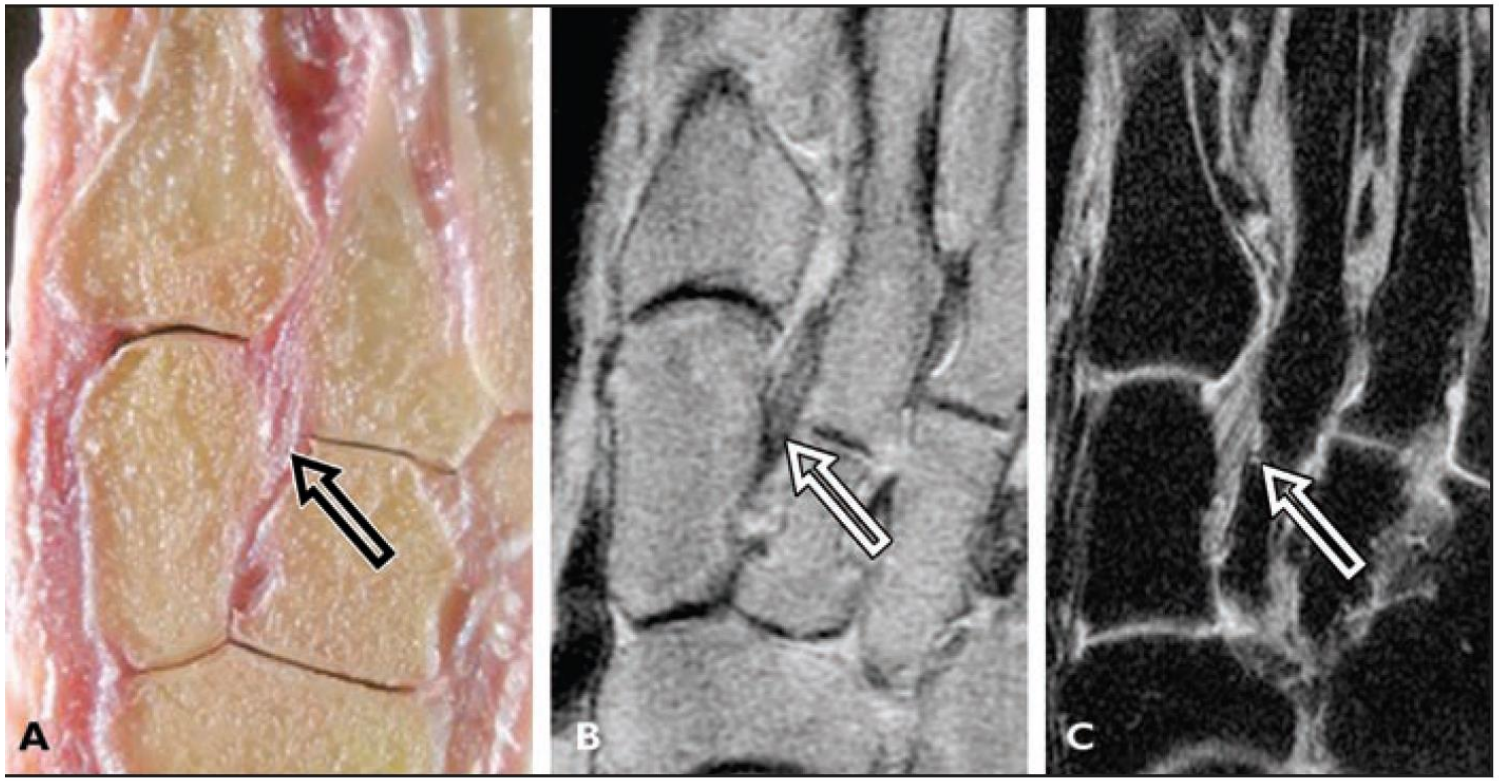
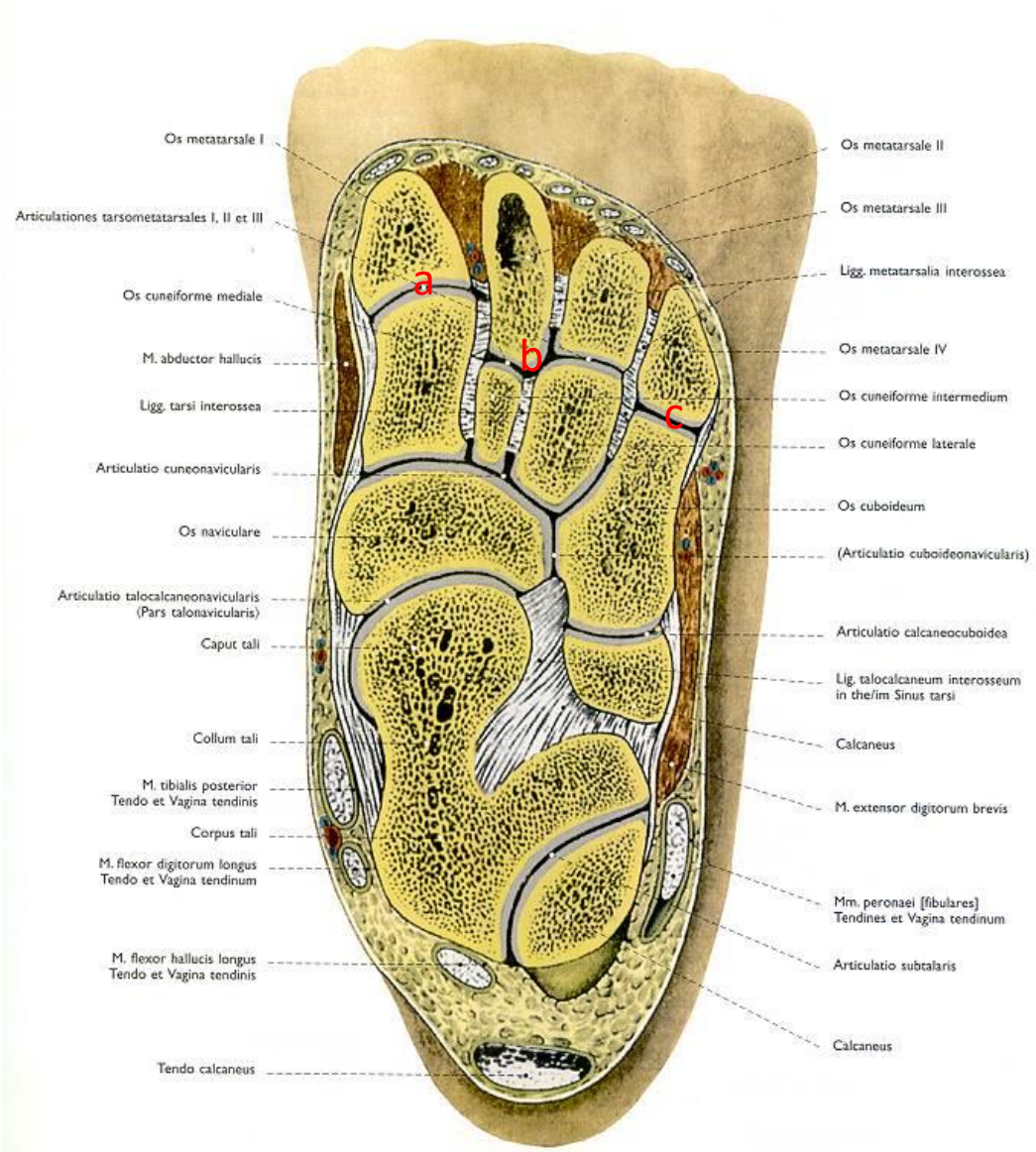
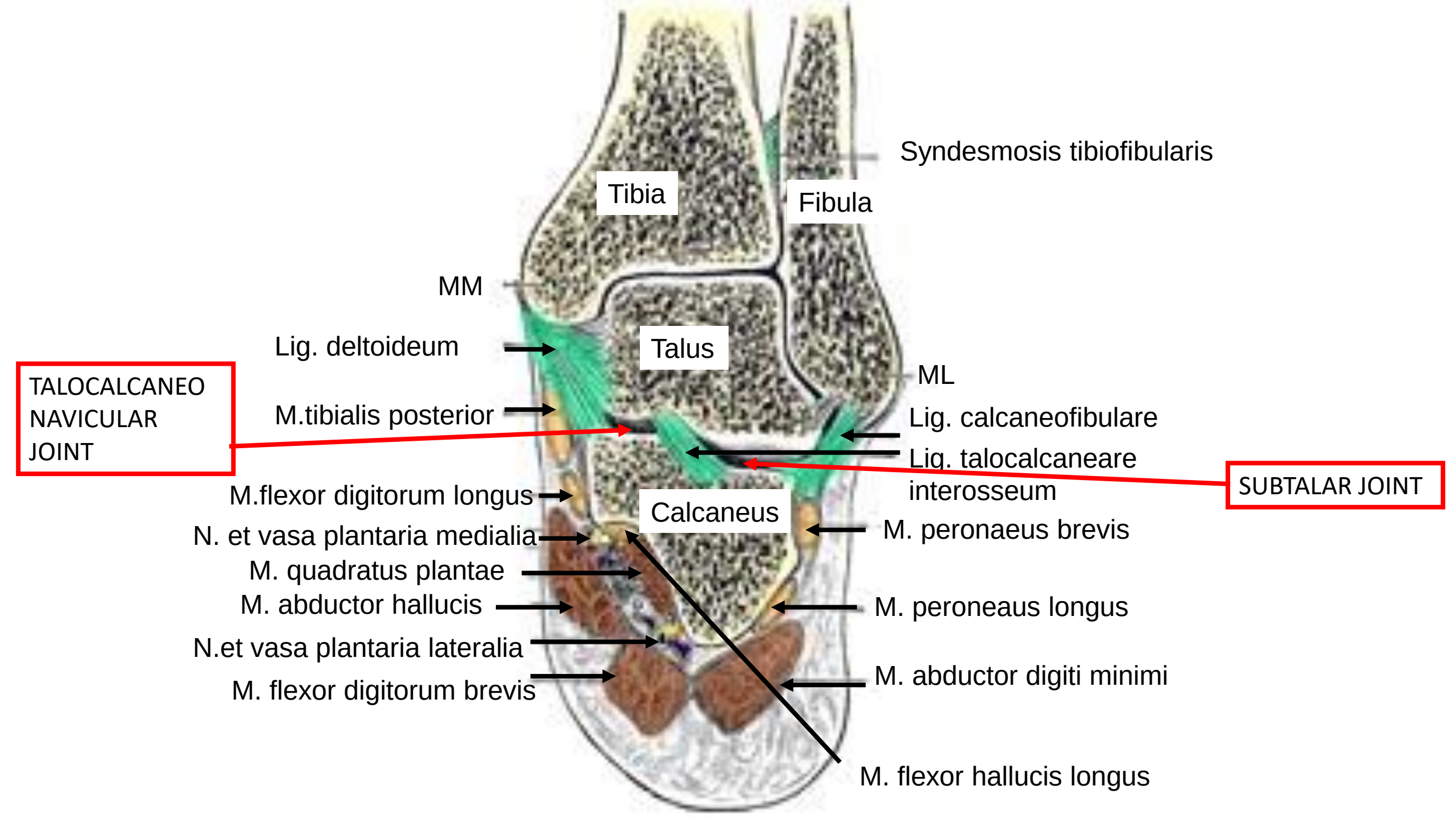


Fig. 2—Lisfranc ligament.
A–C, Photographs of gross anatomic section (**A**) and transverse oblique proton density images after intraarticular injection of gadolinium solution, without (**B**) and with (**C**) fat saturation, show Lisfranc ligament (*arrows*) extending from lateral surface of C1 to medial aspect of M2. Note striated appearance and intermediate signal intensity in MR images.

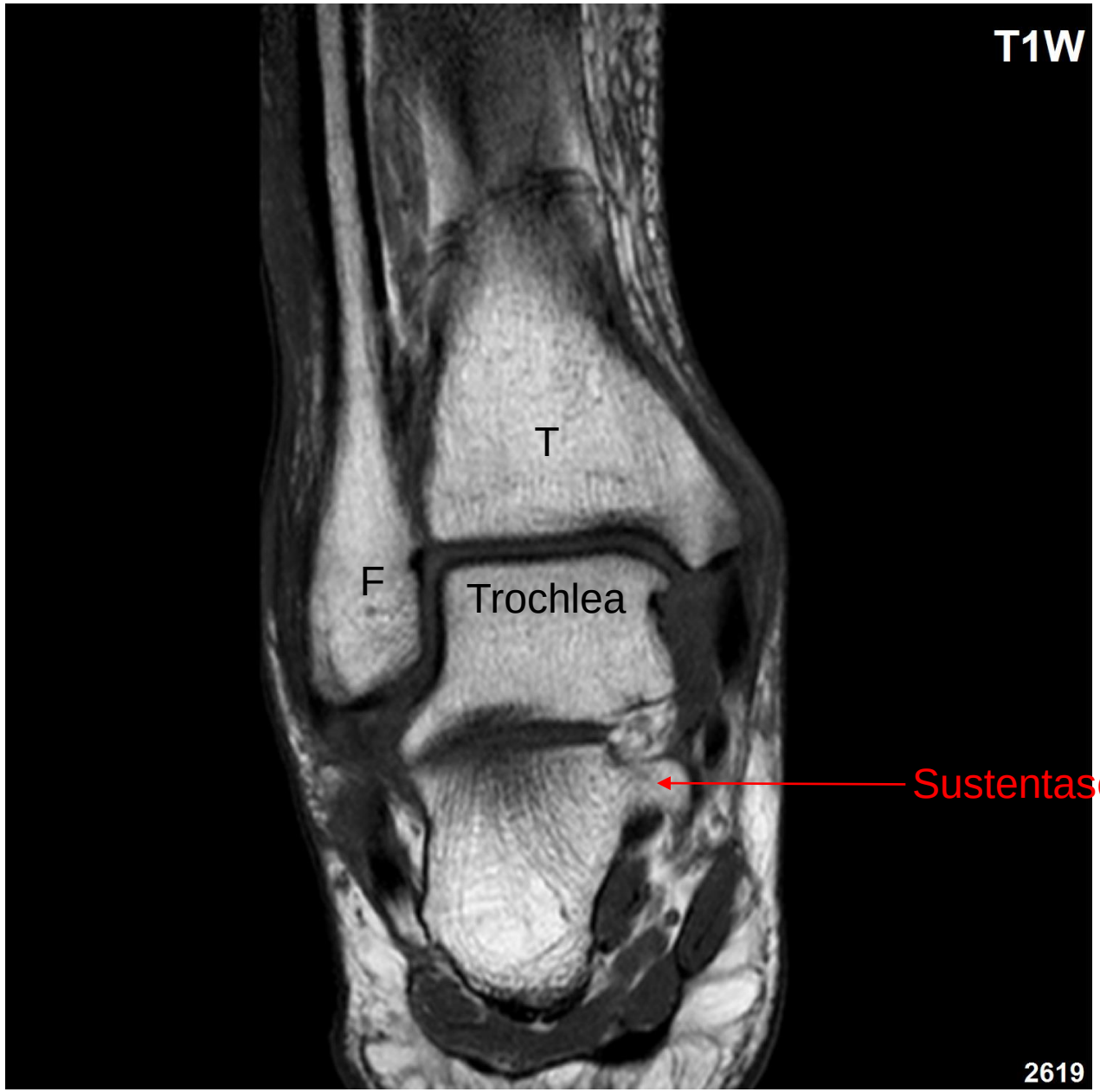
Castro et al. 2010 http://www.ajronline.org/doi/pdf/10.2214/AJR.10.4674

3 joint cavities in the Lisfranc joint



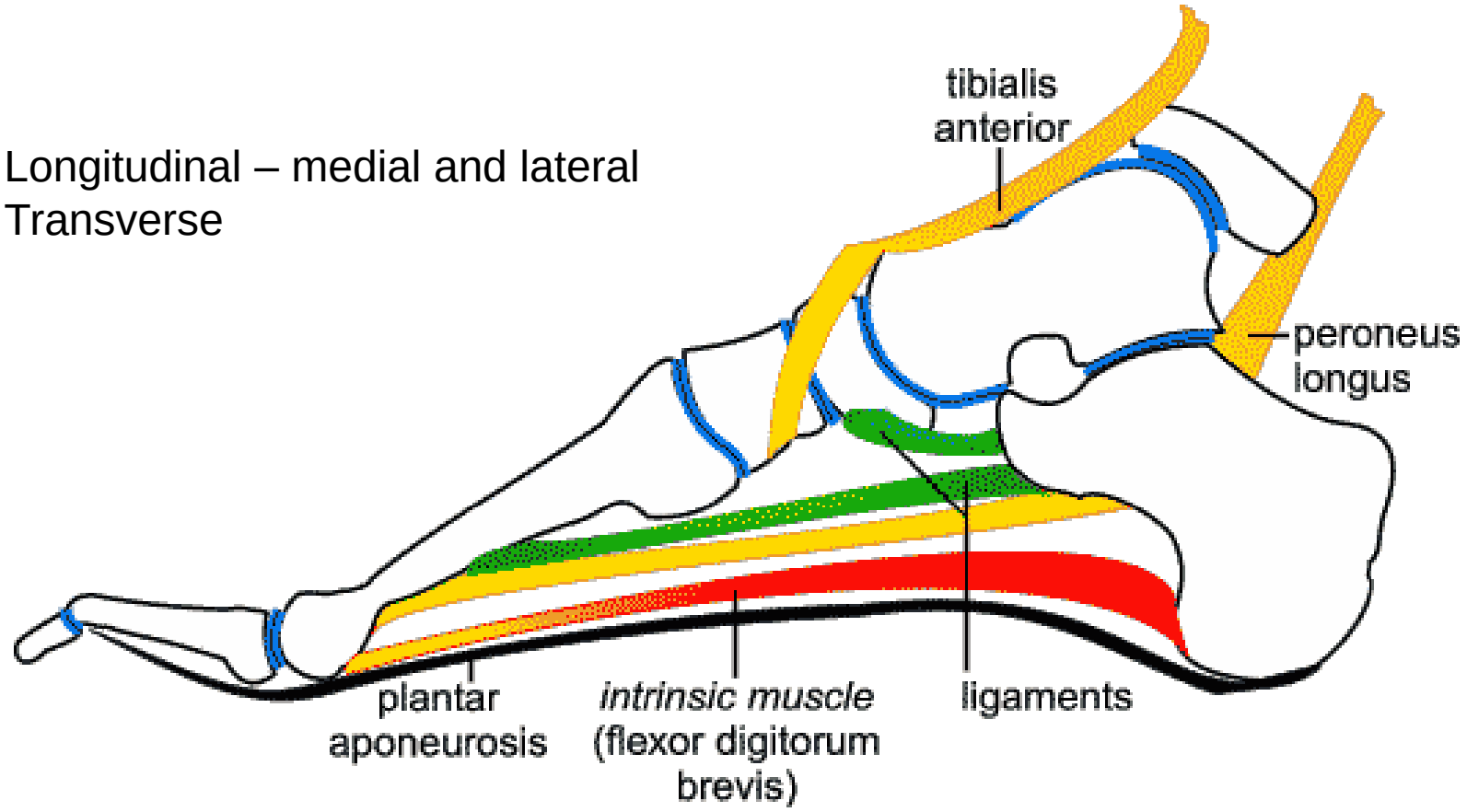

Syndesmosis tibiofibularis
Tibia
Fibula
MM
Talus
Lig. deltoideum
ML
TALOCALCANEO NAVICULAR JOINT
M.tibialis posterior
Lig. calcaneofibulare
Lig. talocalcaneare interosseum
SUBTALAR JOINT
M.flexor digitorum longus
Calcaneus
N. et vasa plantaria medialia
M. peronaeus brevis
M. quadratus plantae
M. abductor hallucis
M. peroneaus longus
N.et vasa plantaria lateralia
M. abductor digiti minimi
M. flexor digitorum brevis
M. flexor hallucis longus

MRI



Foot arches

Longitudinal – medial and lateral
Transverse

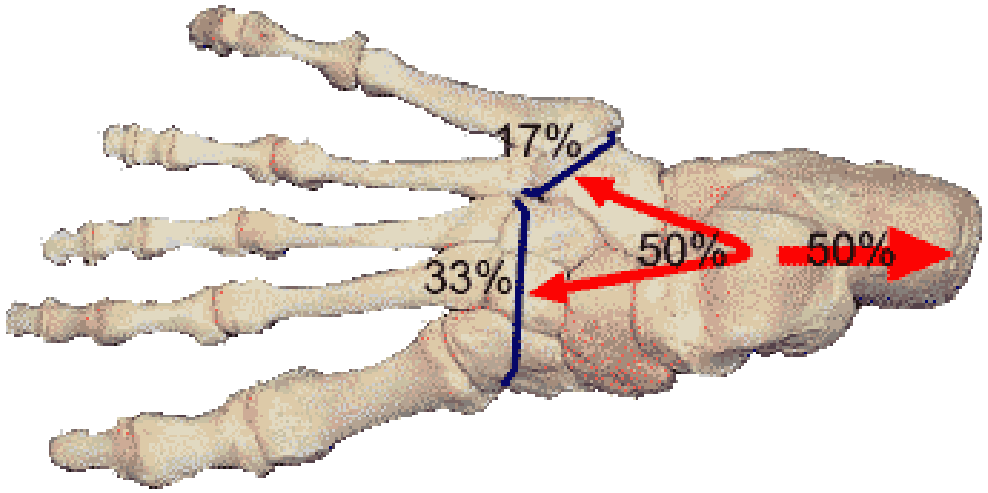


Supported by: Bones, ligaments, muscles

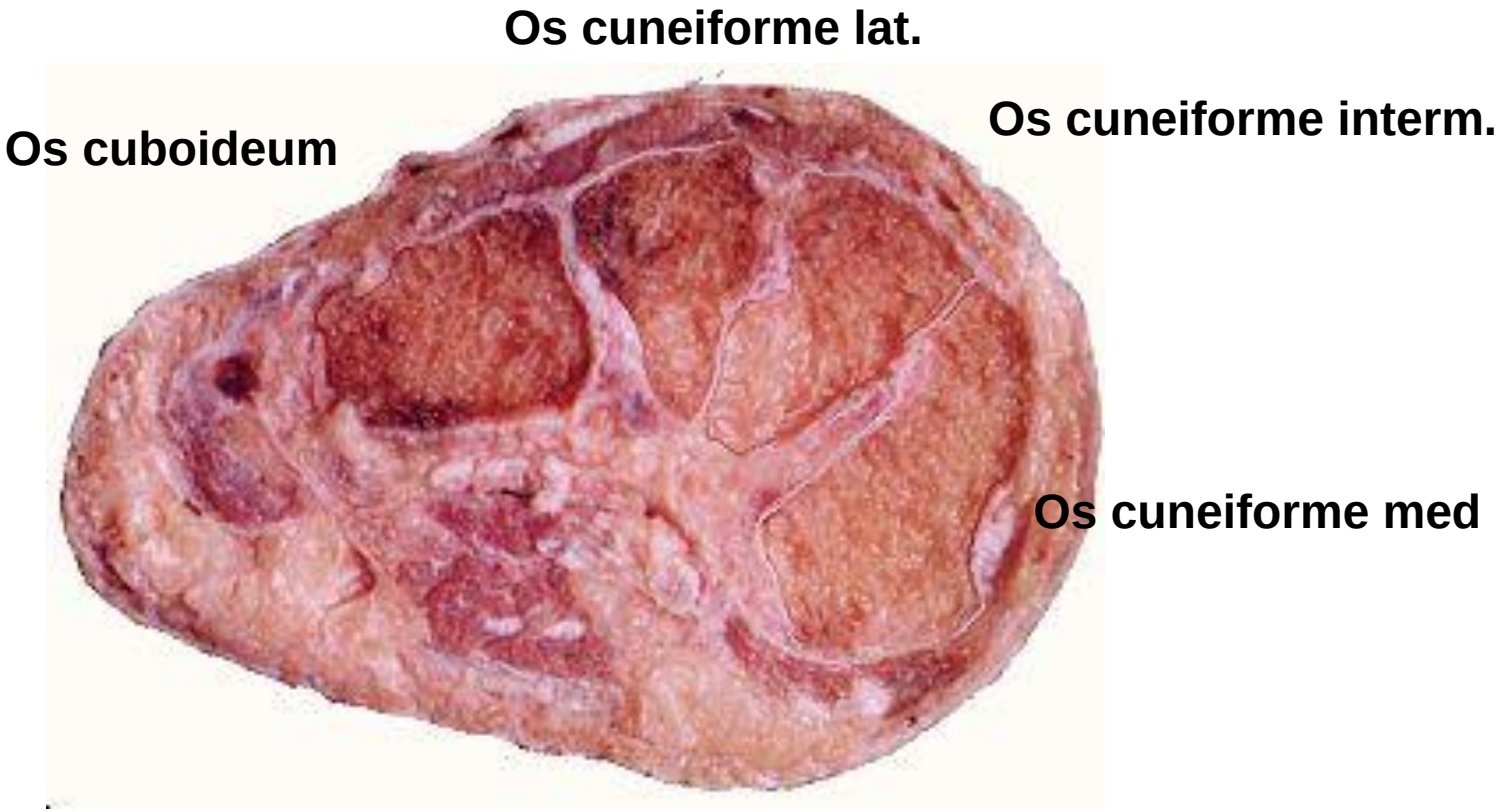
Foot (plantar) arches

- tarsal and MTT bones are arranged in longitudinal (med. , lat.) and transverse arches with **shock absorbing**, **weight bearing** function are maintained by:
- 1. Shape of interlocking bones
- 2. Strength of the plantar ligg. + plantar aponeurosis
- 3. Action of tendons of muscles – **tibialis ant. and post., peroneus longus and brevis, flexors of the foot**

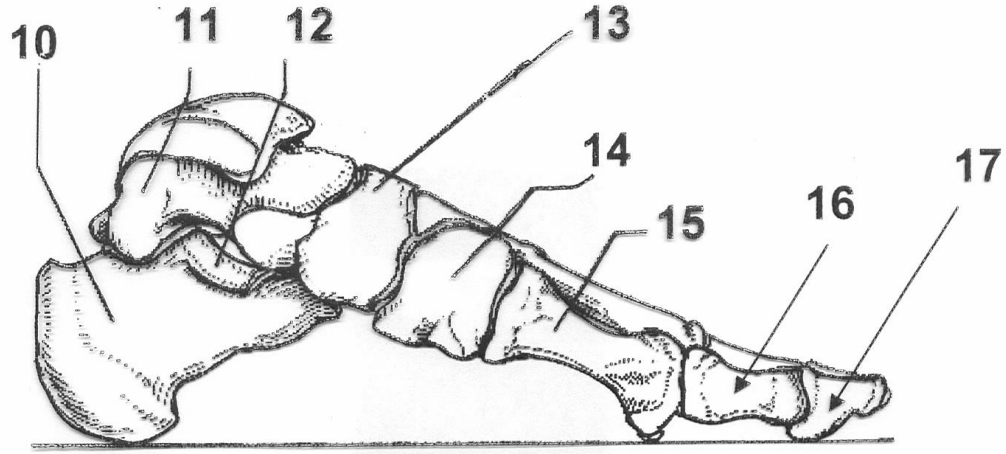
Body weight transmission

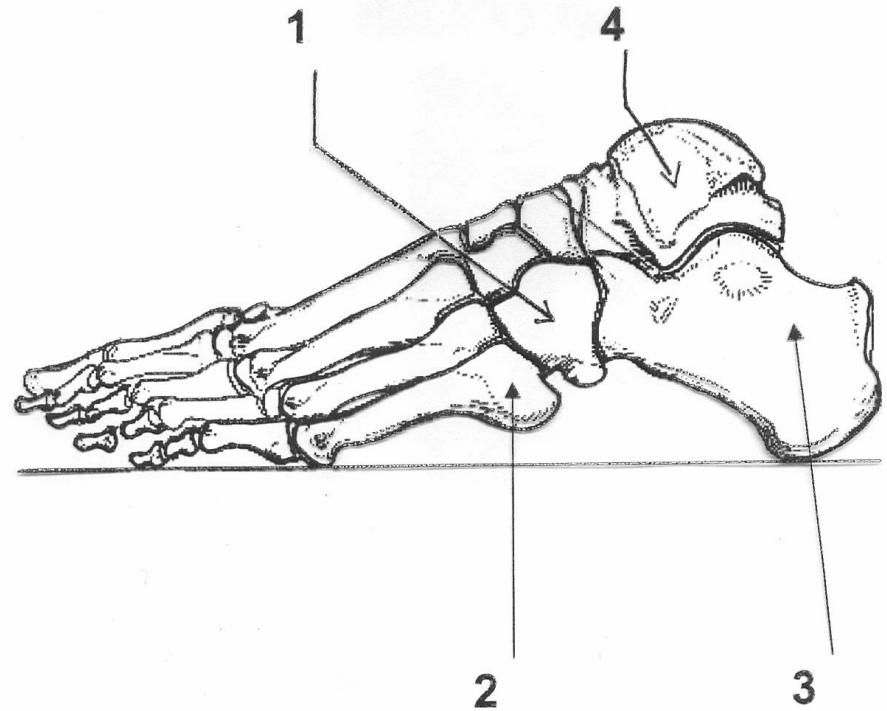


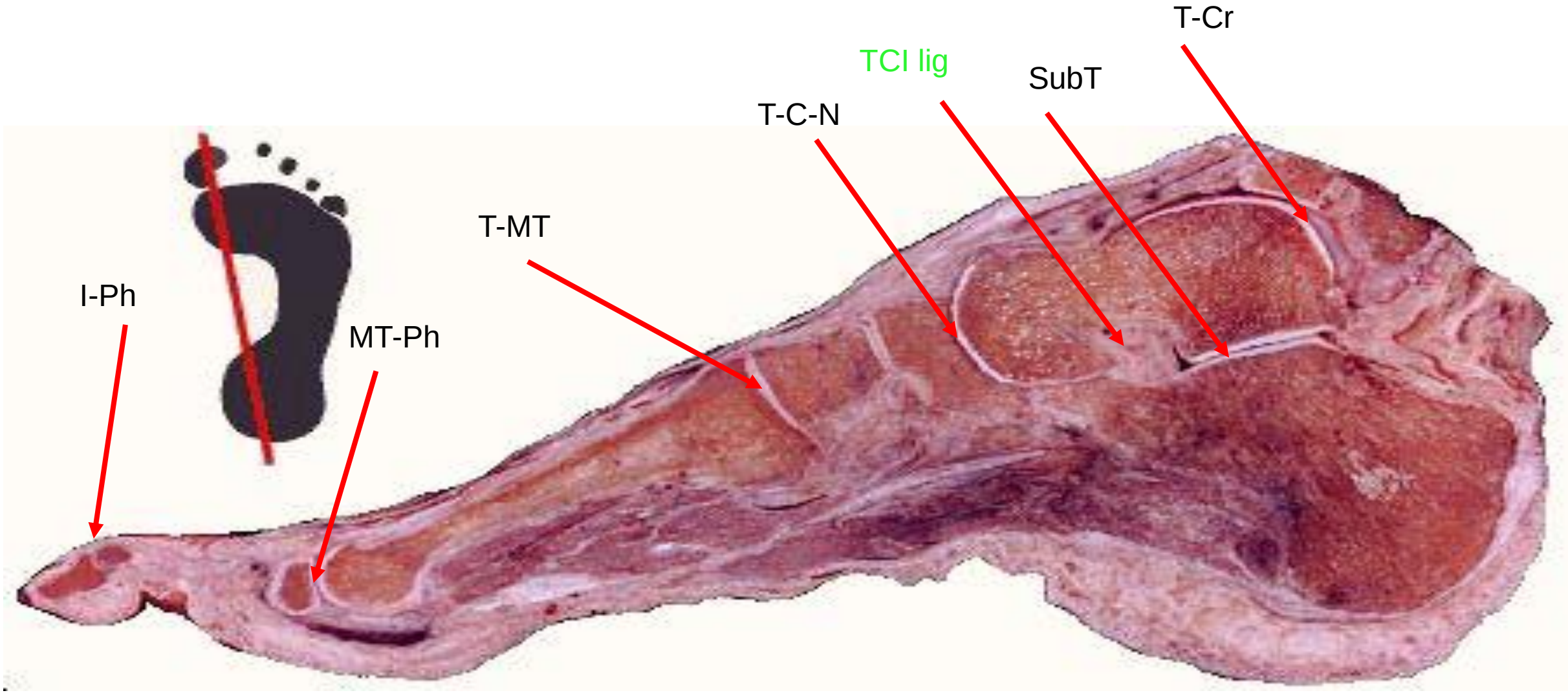
Transverse foot arch

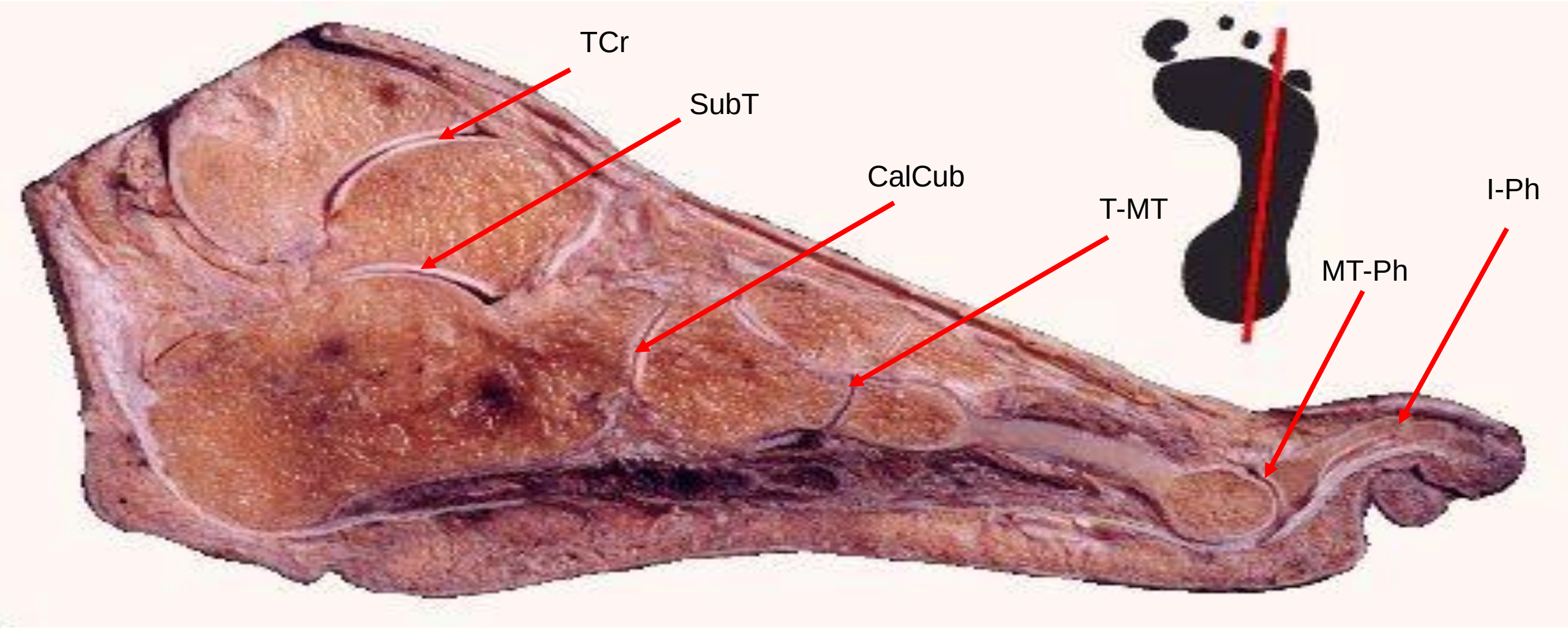


Longitudinal arches – medial and lateral



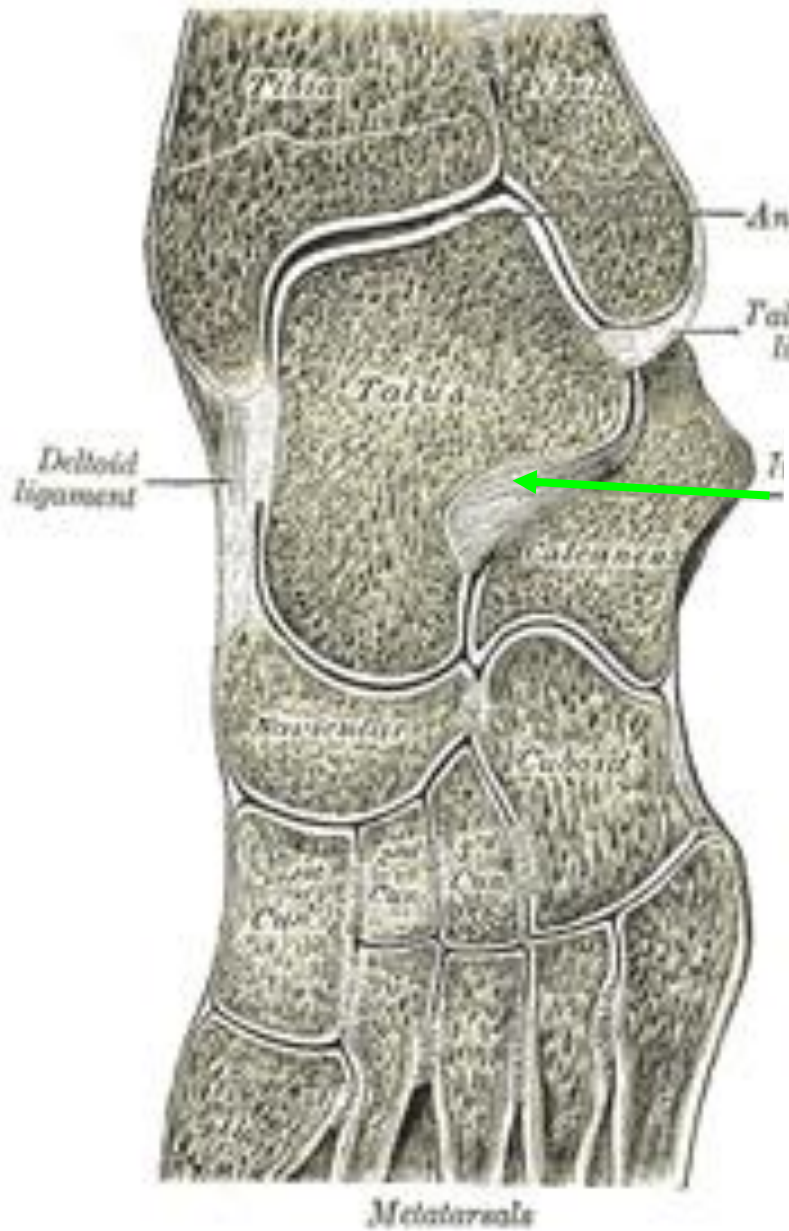



T-Cr
TCI lig
SubT
T-C-N
T-MT
I-Ph
MT-Ph

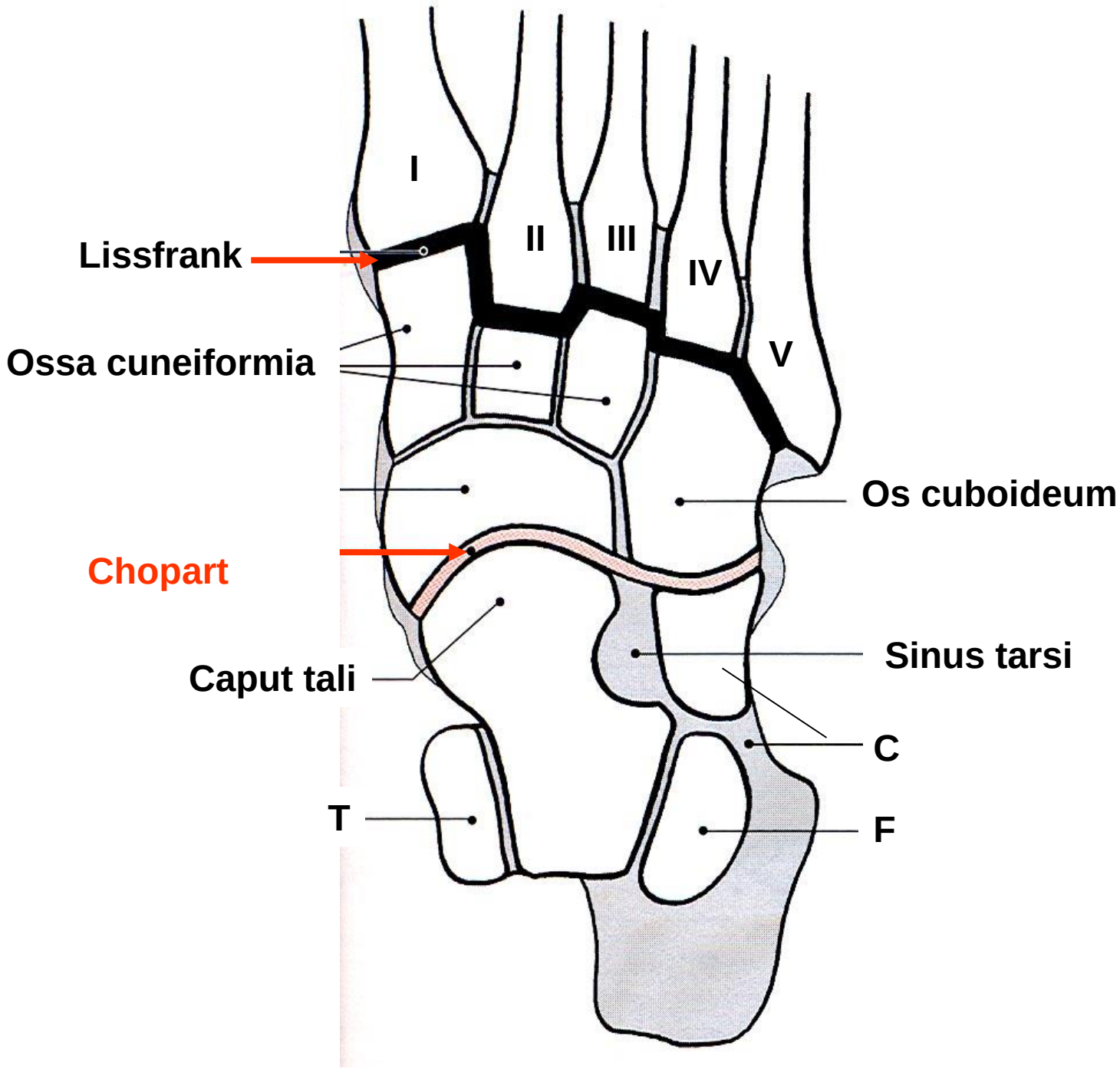

TCr
SubT
CalCub
T-MT
MT-Ph
I-Ph


Sesamoid bone

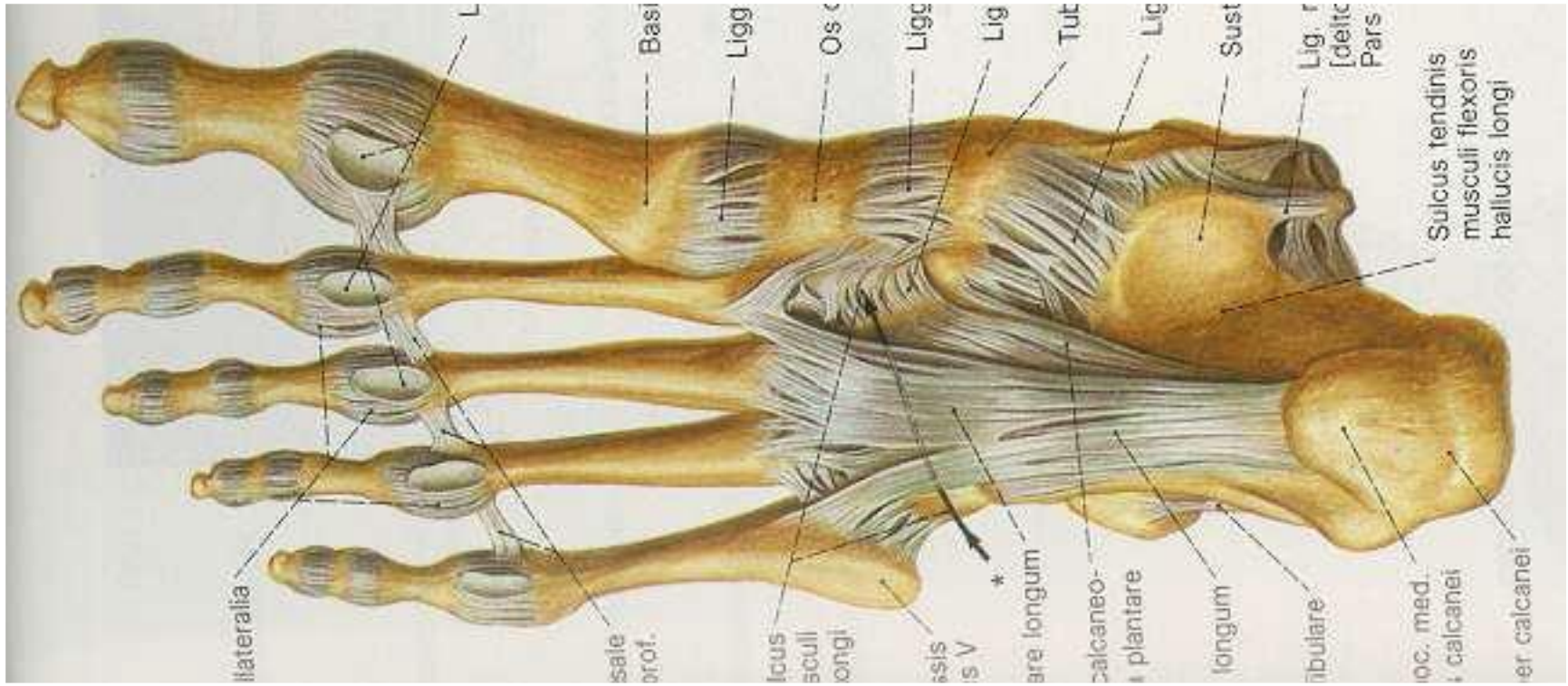

Sinus tarsi



Ligamentum talocalcaneare interosseum

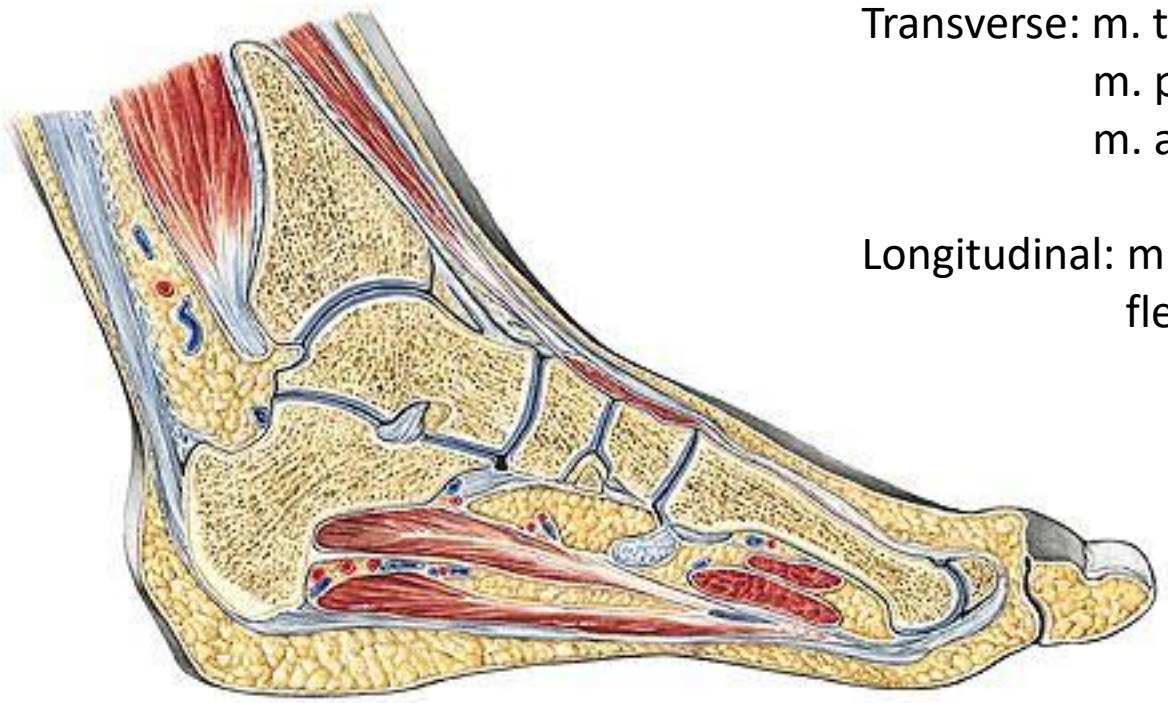

I
II
III
IV
V
Lissfrank
Ossa cuneiformia
Os cuboideum
Chopart
Caput tali
Sinus tarsi
C
T
F

Ligaments supporting the foot arch



plantar aponeurosis, long plantar lig., plantar calcaneonavicular (spring) lig., short plantar ligg

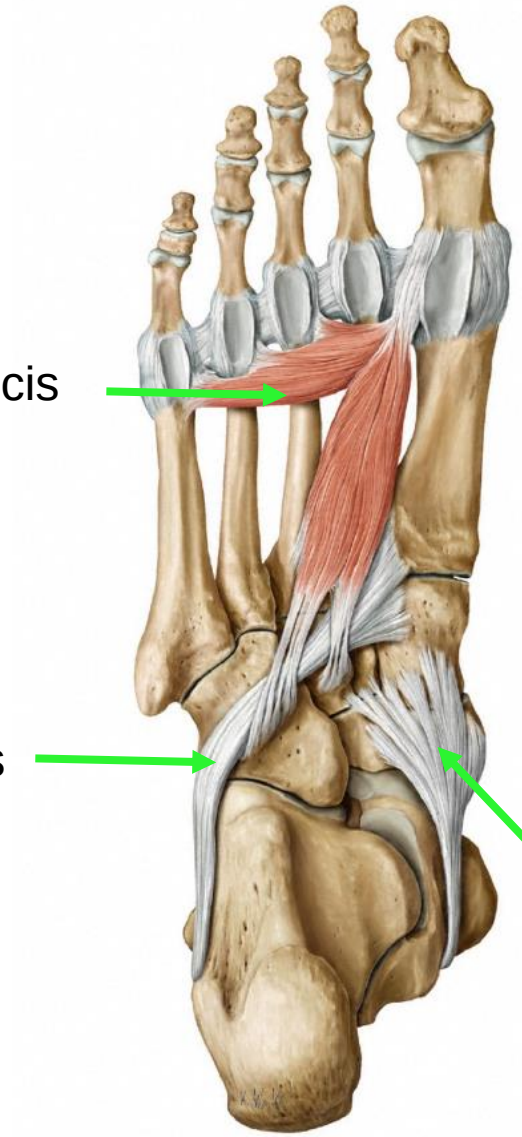
Muscles supporting the foot arch



Transverse: m. tibialis anterior
m. peroneus longus
m. adductor hallucis transverse head

Longitudinal: m. tibialis ant+ post
flexors

Muscles supporting the foot arch

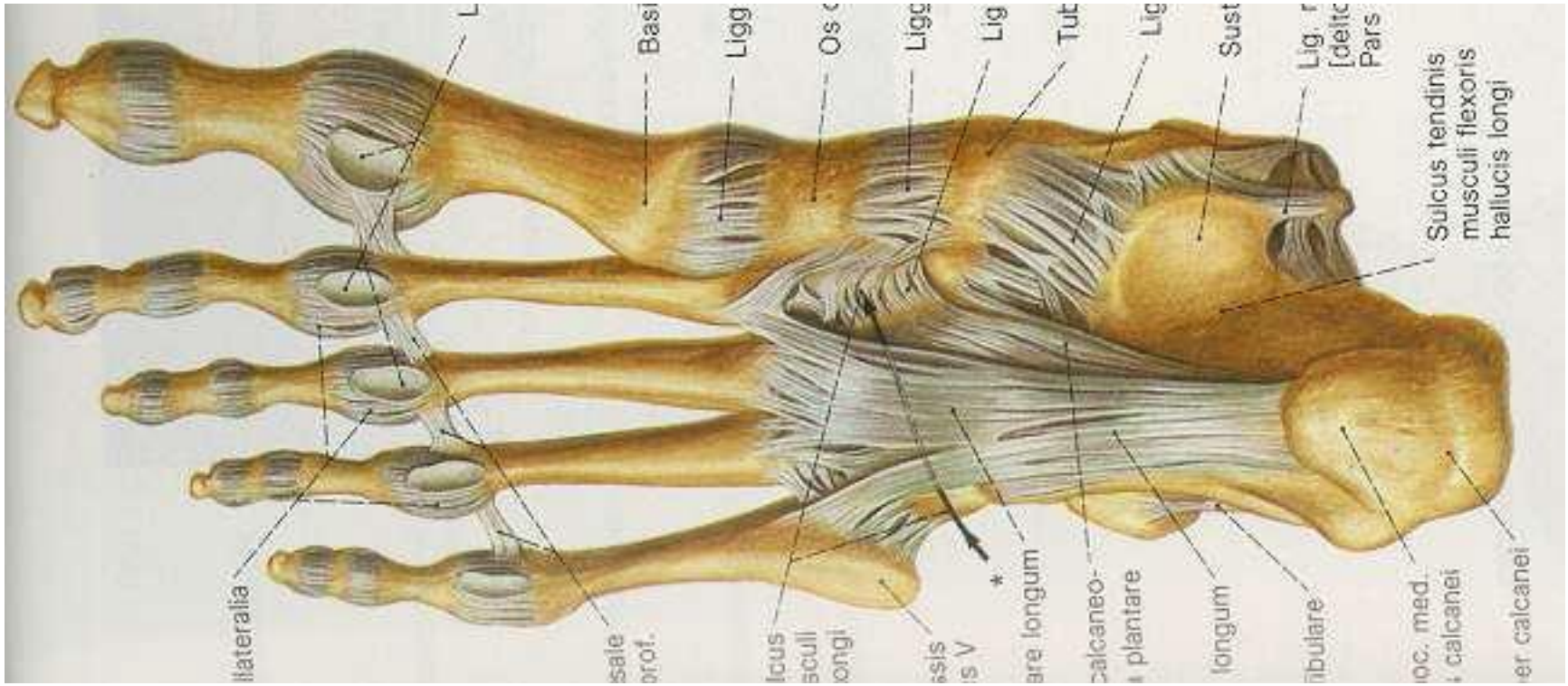


m. adductor hallucis

m. peroneus longus

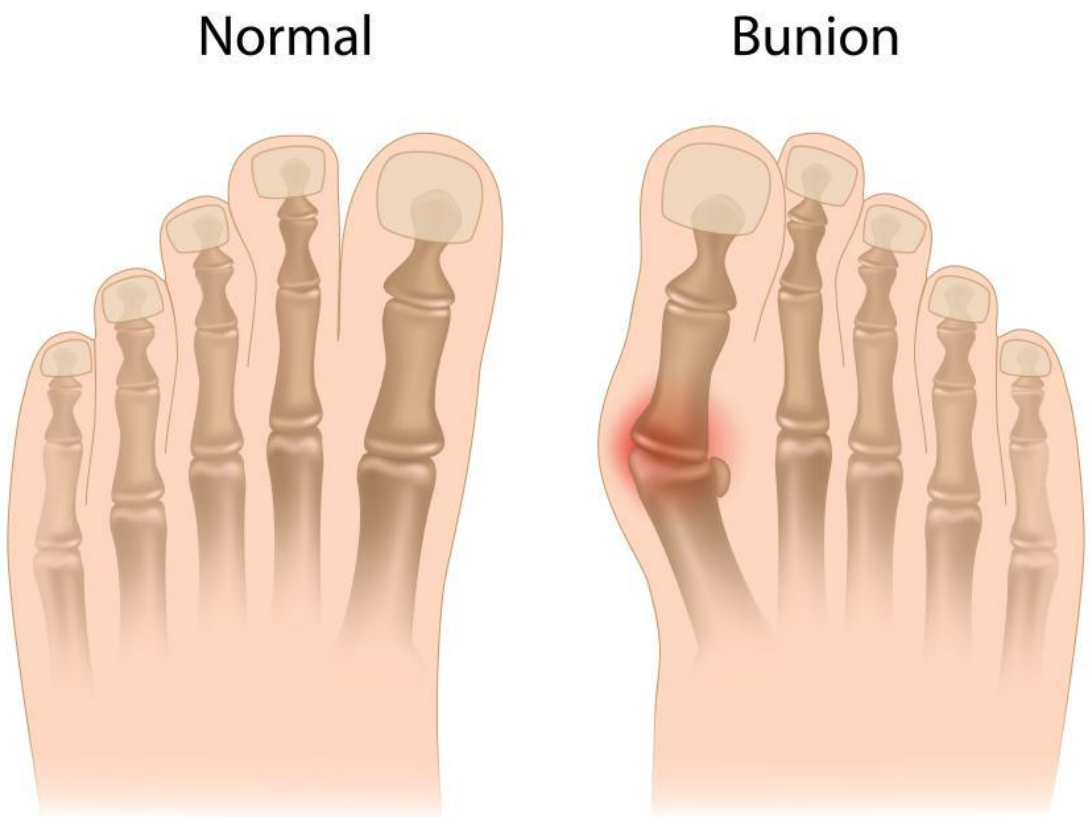
m. tibialis posterior

Articulatio metatarsophalangealis



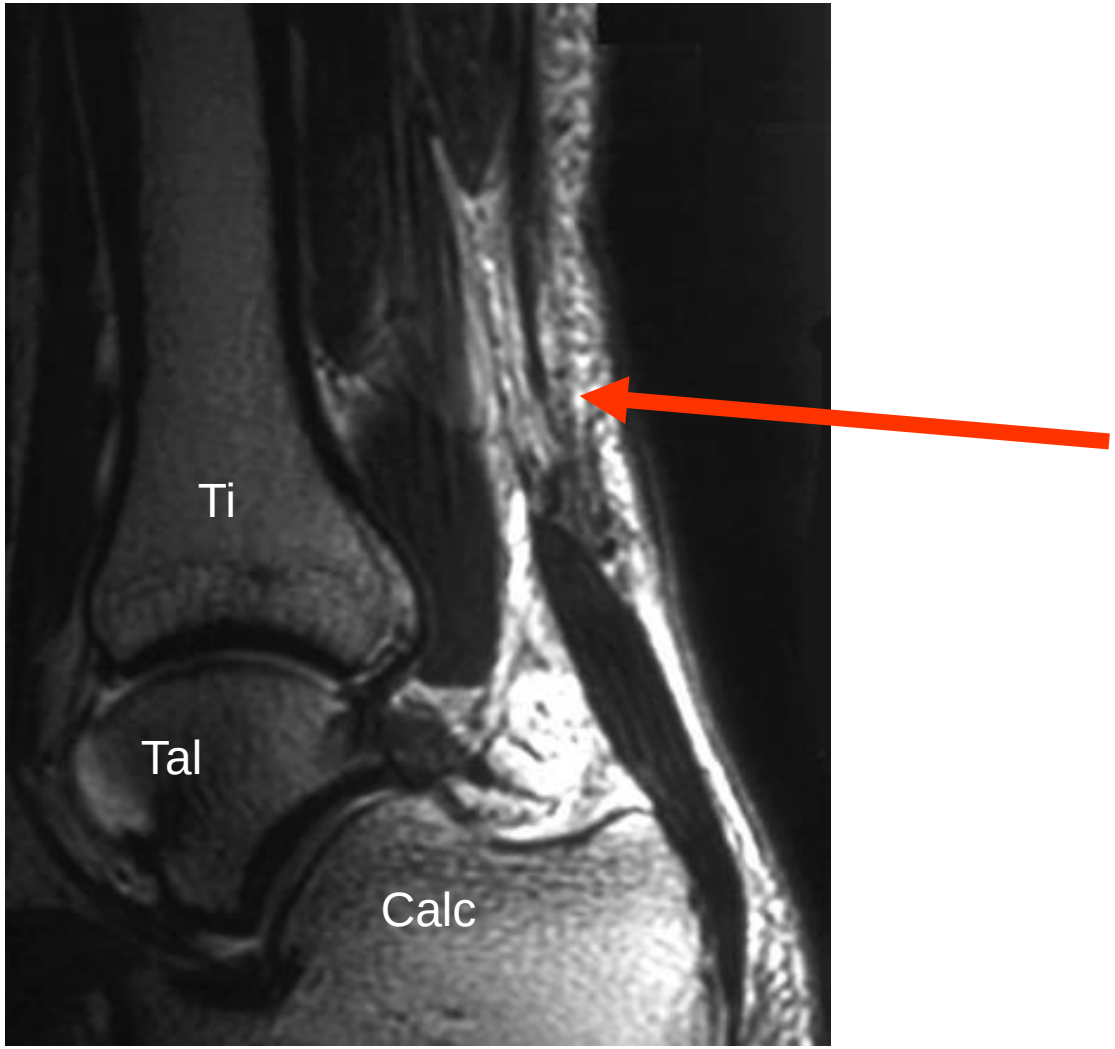
Lig. metacarpale transversum profundum

Hallux valgus



http://medical.miragesearch.com/treatment/orthopedic-joint-treatment/hallux-valgus-bunions/

CT Achilles tendon rupture

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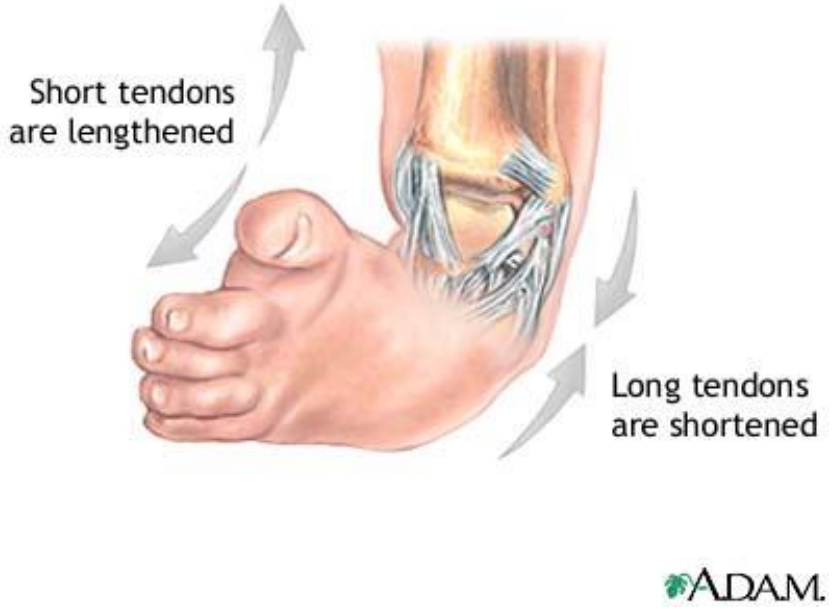
Dept. of Radiology
Indiana University
Metatarsal fractures
R
139

Pes equinovarus congenitus



Sources:

1) Čihák: Anatomie I
2) Grim: Zálkady anatomie I
3) Petrovický: Anatomie I
4) Sobota: Atlas anatomie člověka
5) Platzer Locomotor systém
6) Bartoníček http://anat.lf1.cuni.cz/souhrny/lekzs0302.pdf
7) http://www.ajronline.org/toc/ajr/current
8) Netter: Atlas
9) Personal archive