노인에서 뒤꿈치와 발목의 변형과 통증

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2. 치료 방법들

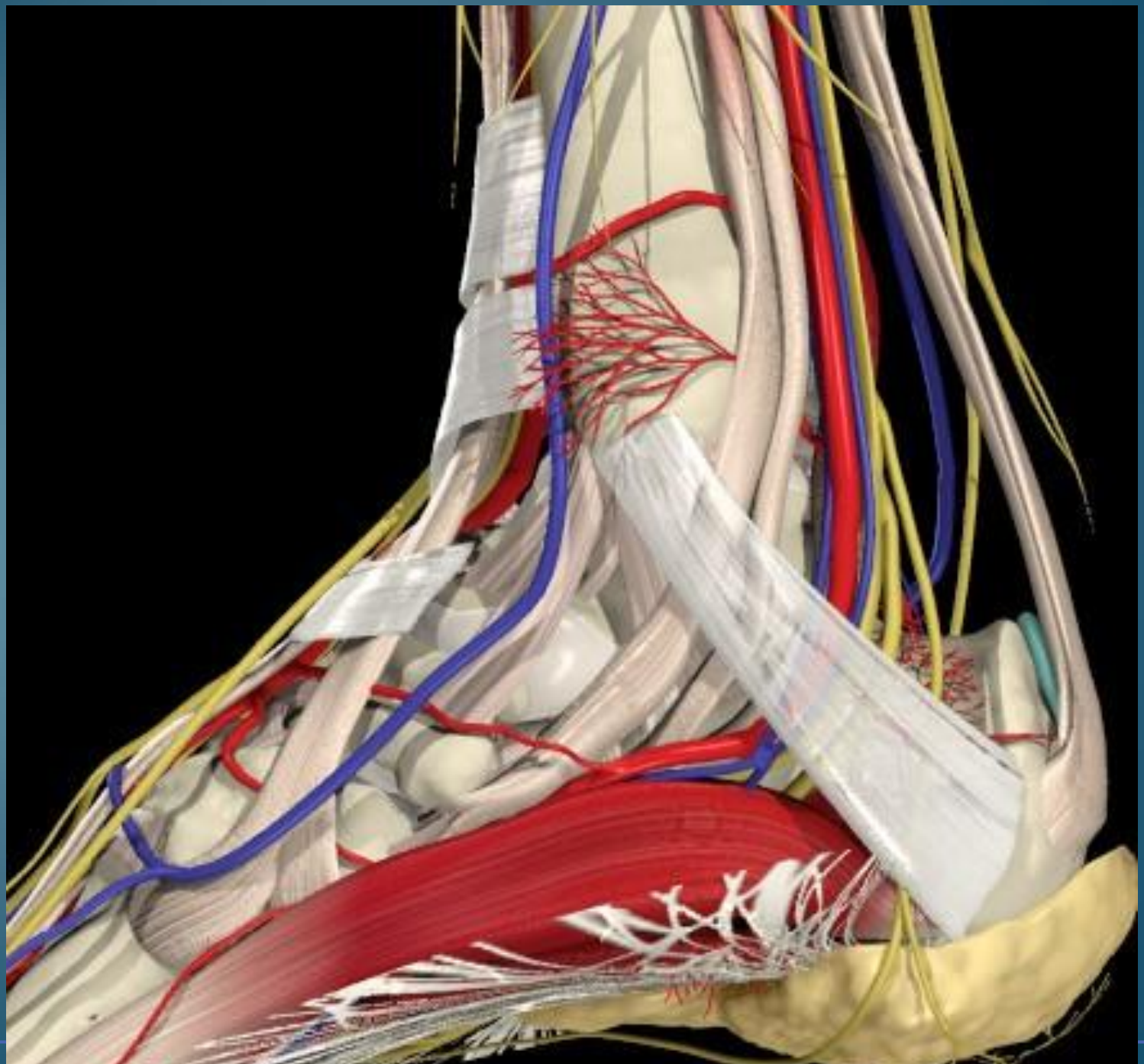
3. 노인 발목/뒤꿈치의 변형
4. 치료 방법들

Pain in hindfoot in the eldly

- **Lateral ankle pain**
  - repetitive sprain & Anterolateral impingement
  - Sinus tarsi SD
  - Peroneal tendinopathy
  - Talus Stress Fx

ATFL repitative sprain
Anterolateral impingement
Sinus tarsi SD

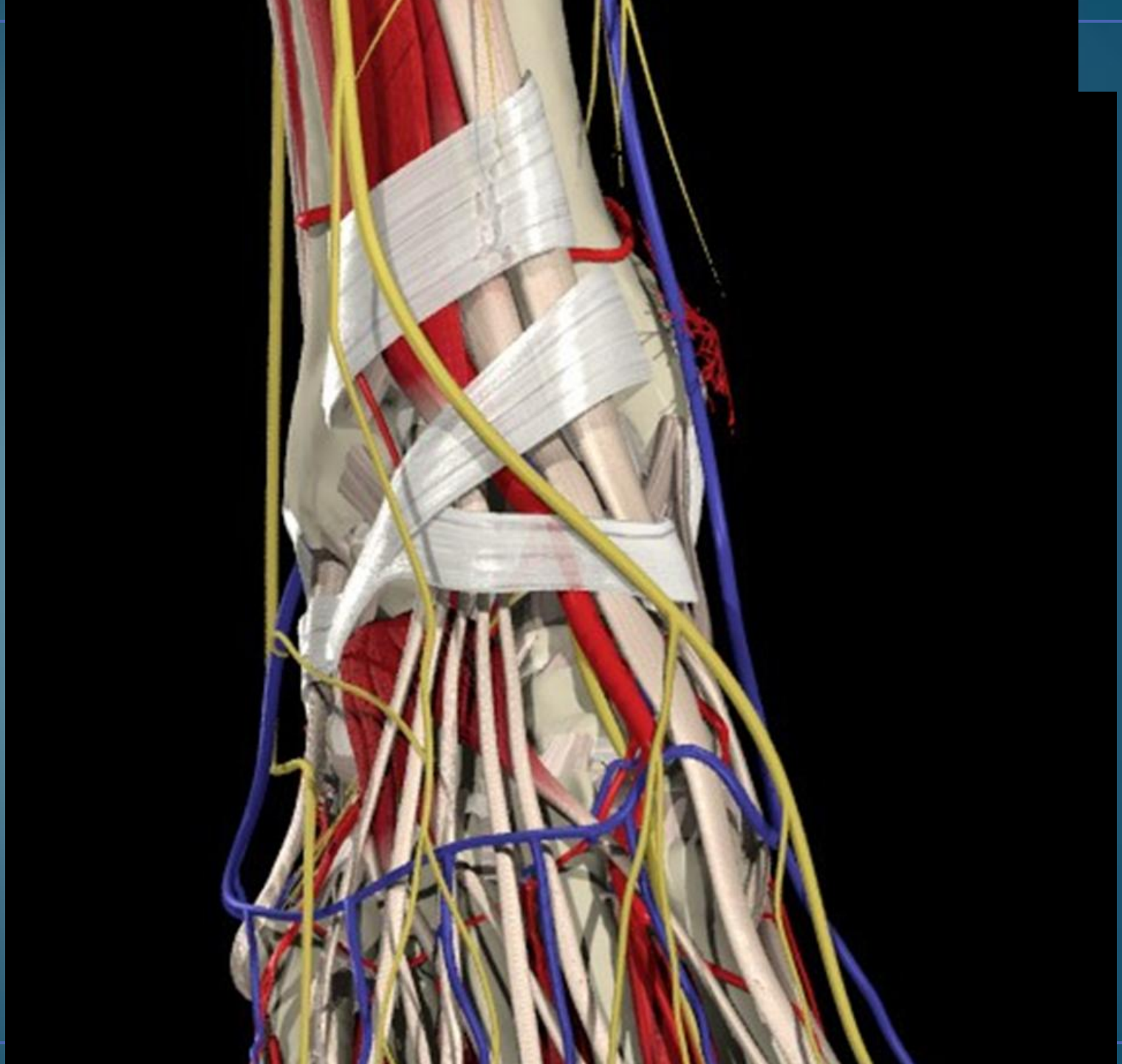
- **Medial ankle pain**
  - Tibialis posterior tendinopathy
  - Tarsal tunnel SD
  - FHL tendinopathy
  - FDL tendinopathy



- **Posterior ankle pain**
  - Insertional achilles tendinopathy
  - Retrocalcaneal bursitis
  - Haglund's deformity (disease)

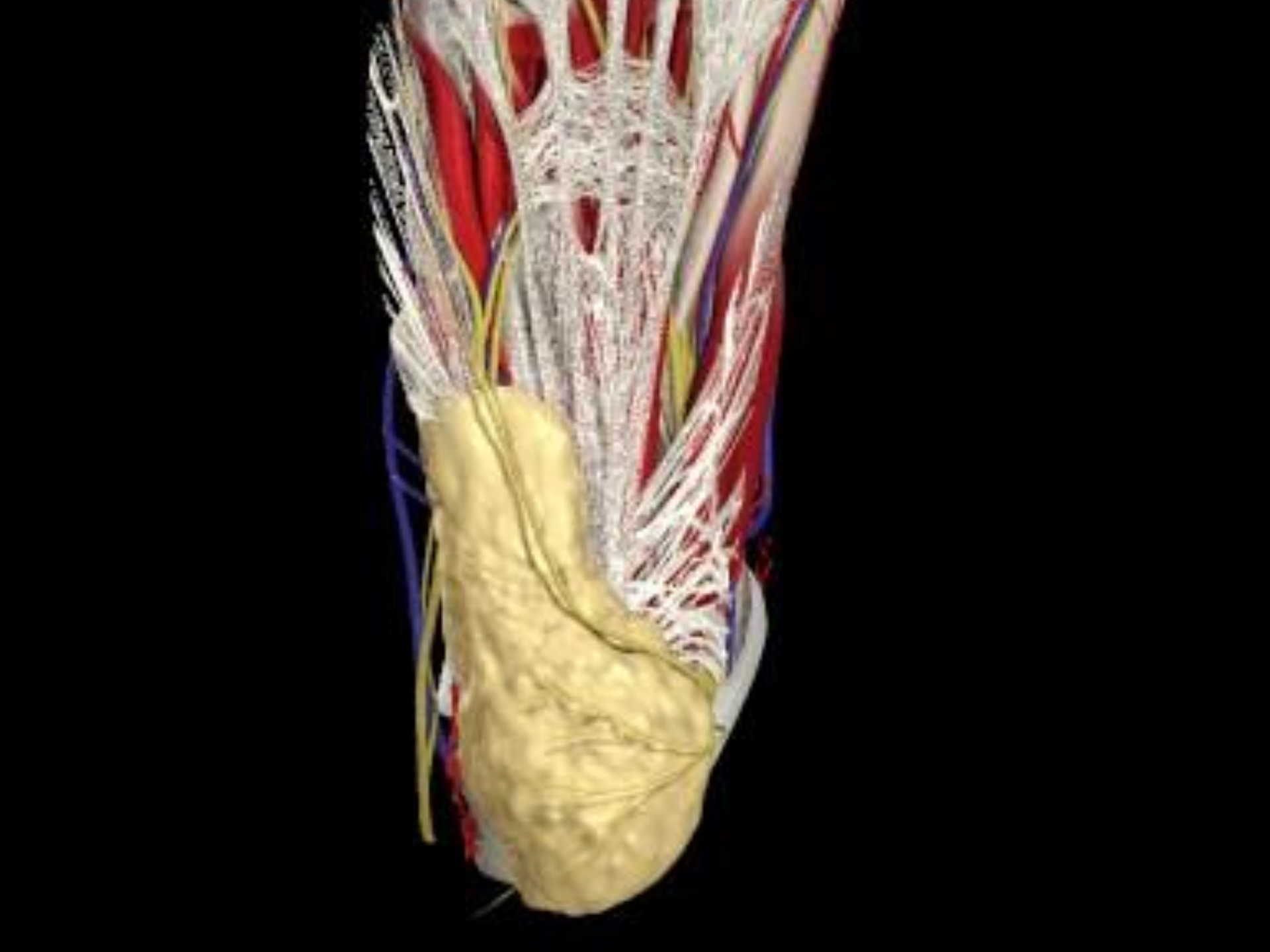
  - Posterior ankle impingement SD

- **Anterior ankle pain**
  - Ankle jt arthritis :OA, inflammatory arthritis
  - Traumatic synovitis after sprain
  - Osteochondral lesion on talar dome
  - Syndesmosis sprain
  - Anterior impingement
  - Charcot joint
  - Tendinosynovitis: Tibialis anterior, EDL, . . .



- **Heel plantar pain**
  - Plantar fasciitis
  - Heel pad contusion, atrophy

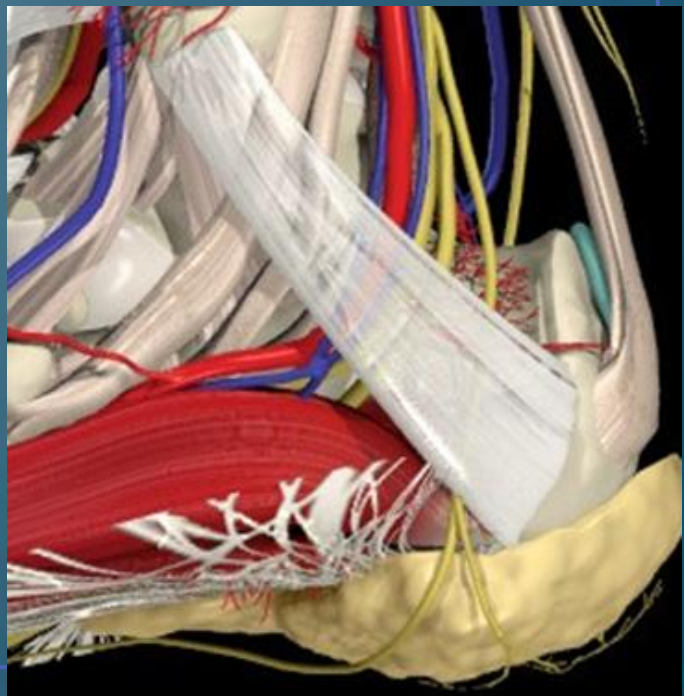
  - Baxter's nerve impingement
  - S1 radiculopathy, foraminal stenosis
  - Hidden calcaneal Fracture



Common disorders

Heel pad atrophy

- Heel pad
  - Columns of Adipose tissues
    - Separated by fibrous septae
  - Shock absorbing



Heel pad atrophy

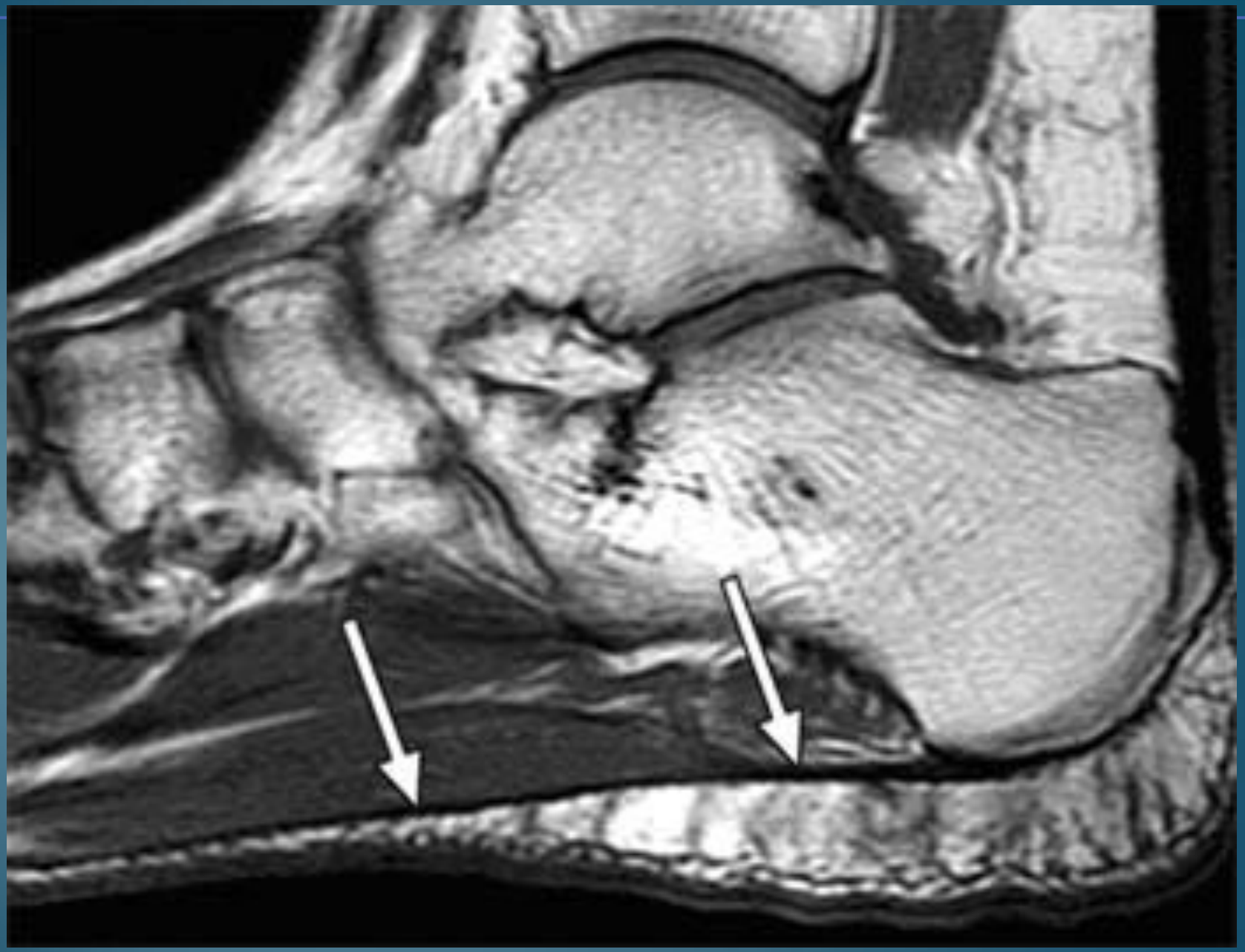
- Sx
  - Diffuse pain
  - Painful at most of the Wt-bearing portion of the calcaneus
    - Not to radiate anteriorly
    - Regardless of toe DF (fascia tension)
- P/Ex
  - Td on midpoint of heel pad
  - Thin heel fat pad
- 호발 : eldly, obese patients, overuse in sports man, Hx of steroid inj on heel pad

- Tx
  - Heel silicon pad
  - Foot orthosis with enough cushion (poron…) and deep heel cup
  - Shoes with enough cushion

1. Heel pad c PORON
2. Dee heel cup tech

Plantar fasciitis

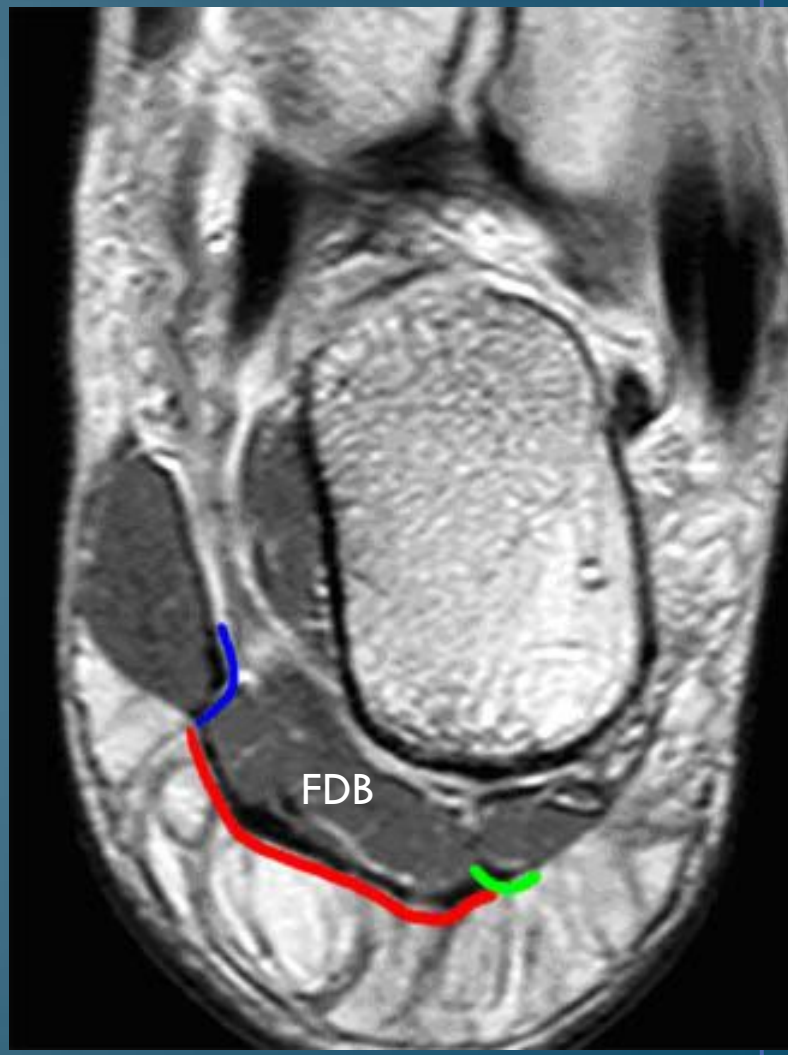
- Plantar fascia
  - A sheet of dense fibrous, collagenous connective tissue
  - Relatively non-elastic
  - Origin : plantar tuberosity of the calcaneus
  - Insertion : deep short transverse ligaments of MT heads



T1-weighted sagittal image in a patient without heel pain. The normal plantar fascia (arrows) is thin demonstrates low signal intensity on all pulse sequences.

- 3 bands: central, medial, lateral
  - m/c affected in central band
- Thickness : 3-4mm

- Functions
  - Support for the longitudinal arch
  - Dynamic shock absorption



Plantar fasciitis

- Sx
  - Pain in first step
    - in the morning
    - After long time sitting
  - Dissipate after several minutes
  - In advanced cases, constant aching or throbbing pain
  - 악화 : 맨발 보행, 아치 서포트 없는 신발 착용

- 악화 위험 인자
  1. Flat foot : overstretched fascia during overpronation
  2. Pes cavus : sudden stretching of fascia at the quick start to run in rigid cavus foot
  3. LLD : 체중 부하를 많이 담당 하는 쪽
  4. Femoral anterversion : → leg int rotation → more pronation of the foot

악화 위험 인자

5. Achilles tightness : Most important factor
   ① STJ overpronation
   ② early heel off → fascia tension 증가

- Physical findings
  - Td on medial tubercle of the calcaneus or Proximal fascia
  - Pain during Windlass test
    - By big toe passive DF
    - Esp, standing position

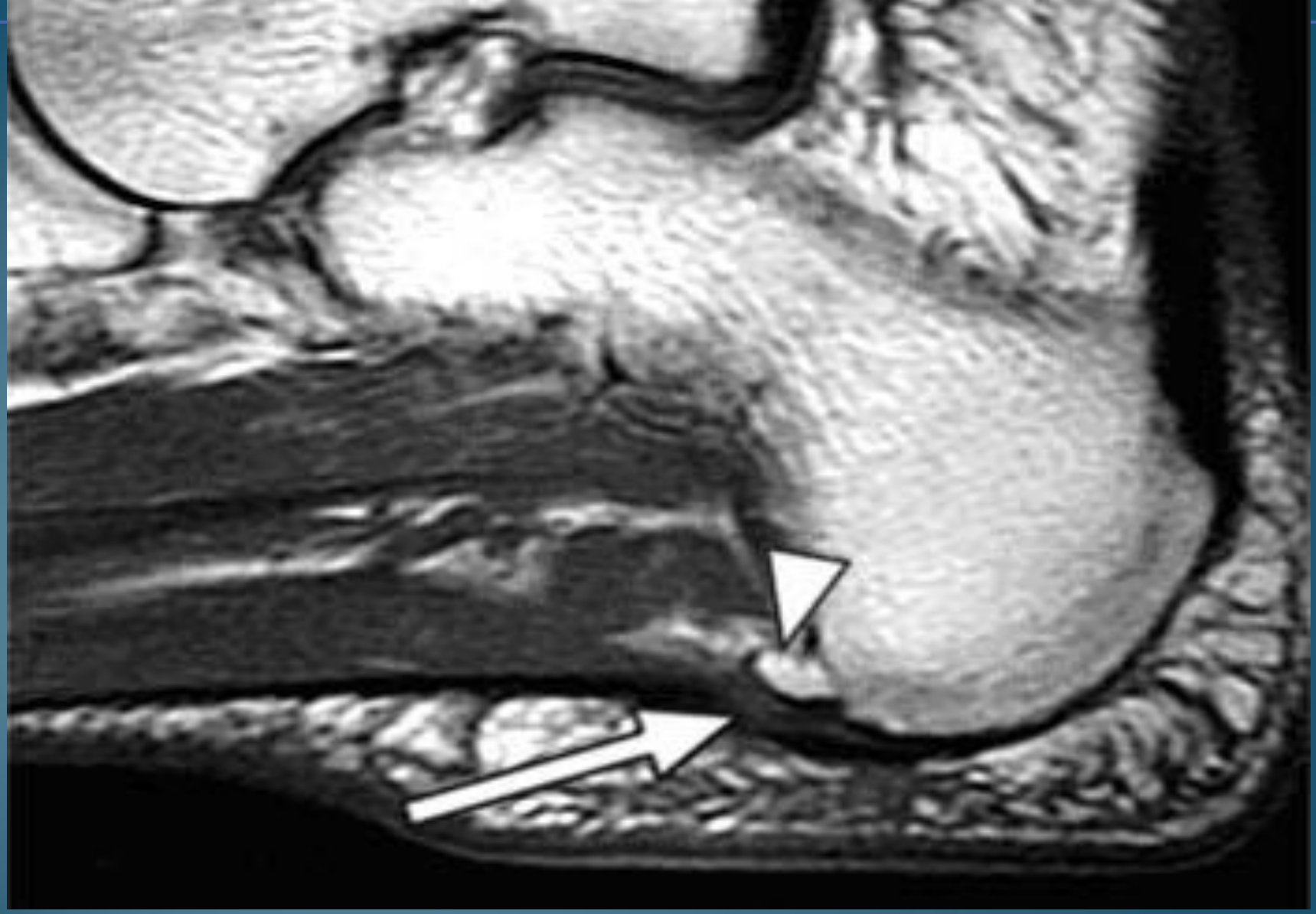
Diagnosis of Plantar fasciitis

- X ray :
  - Heel spur 여부와는 무관
    - Heel spur :15-25% in general population

- US: fascia thickness >4~5mm,, decreased echogenicity, perifascial effusion, hypervascularity (in acute stage)

- MRI :
  - T1 : thickening and increased signal intensity within the plantar aponeurosis at the calcaneal attachment
  - *STIR : minimal edema is present deep to the calcaneal insertion*
- EMG for R/o S1 radiculopathy

STIR : Short T1 inversion recovery



T1-weighted sagittal image in a 50 year old female with mild, chronic heel pain reveals thickening and increased signal intensity within the plantar aponeurosis at the calcaneal attachment (arrow). A prominent calcaneal spur (arrowhead) is present.

Treatment of Plantar fasciitis

- 1st step
  - NASIDs and PTx
  - Padding, silicon heel cup
  - OTC arch support c heel pad,
  - 실내에서도 쿠션 슬리퍼 착용
  - Stretching of calf muscle
  - For 4-6 wks

- **2nd Step**
  - Medication + PTx + calf stretching
  - Custom molded FO
    - Enough heel cushion with deep heel cup tech
    - Especially for overpronated foot → controlling overpronation
  - Night splints
  - For 4~6 wks

- **3rd Step**
  - continued 1st and 2nd step Tx
  - Corticosteroid Inj
    - 1 time Exact infiltration on the fascia under US guidance
    - 1cc lidocaine +10~20mg Triam

      (or 1cc lido + 2mg limethason)

    - Additional injection deep to fascia (b/w fascia and FDB tendon attachment site)
  - Wait for 4~6 weeks


대 학 교
백 병 원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- **4th Step**
  - ESWT 3~5 times, every week,
  - Fasciotomy, nerve release

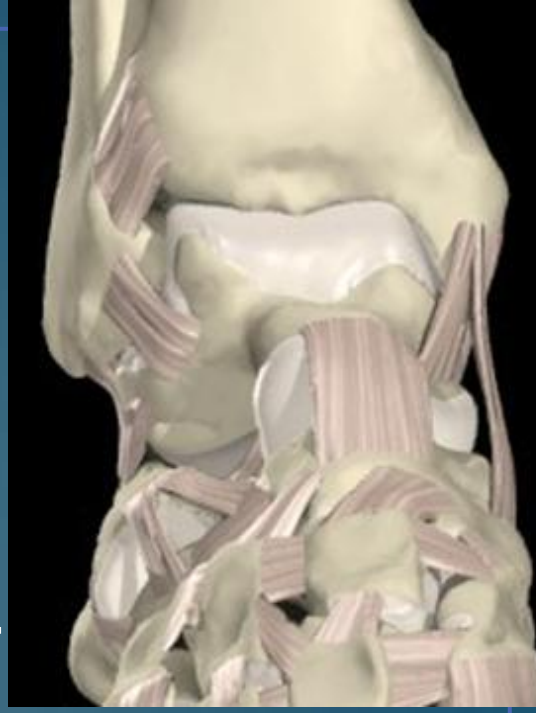
- ----------
- 새로 시도중인 치료법들
  - Botulinum toxin injection
  - Prolo Tx
  - PRP

Case : M/45, Lt plantar heel pain

- Onset :3 mon ago, aggravated 2 weeks ago
- Pain charac : first step pain, worse after walking
- Past Hx: 3 times steroid inj in local clinic under Dx of plantar fasciitis
- P/Ex :
  - direct td on med calc tubercle, windlass test ^ㅣ ㅌㅈ ㅇㅇ(+)
  - severe hyperkeratosis on heel
  - Td on med heel soft tissue when pinching


Blind Injection 의 문제점
1. 접근 방법
2. 주사 깊이

Ankle arthritis



- Ankle joint 특성
  - 단위 면적당 받는 체중이 크다.
  - 하지만, 다른 관절에 비해 관절염의 비율은 낮다
    - 1/9 of knee and hip arthritis
  - Rolling jt 역할, 높은 하중에서 정합성 보임
  - 외상도 흔히 발생

- 관절 연골두께 : 1~1.7mm 로 제일 얇음. 다른 관절에 비해 상대적으로 일정한 두께. Compressive modulus는 제일 높다.

- 관절의 정합성이 떨어질수록, 접촉 면적이 일부분에 집중 → 퇴행성 ↑

- 발목관절 연골은 tensile strength가 타 관절에 비해 높고, 굳질성이 높아서 indentation 적다

Ankle arthritis

- 원인
  - 외상: 관절 연골의 손상 정도, 관절면의 정확한 정복 여부가 크게 관여
  - 비정상적인 발목의 생역학 → 퇴행성 변화
  - 염증성 질환, 혈관질환, 감염
  - 신경병증 관절증
  - 종양

Ankle arthritis

- Sx
  - Pain on Wt bearing or motion
    - ᄌᆞᄅᆞ anterior ankle pain
  - Swelling, morning stiffness of ankle
  - Warmth

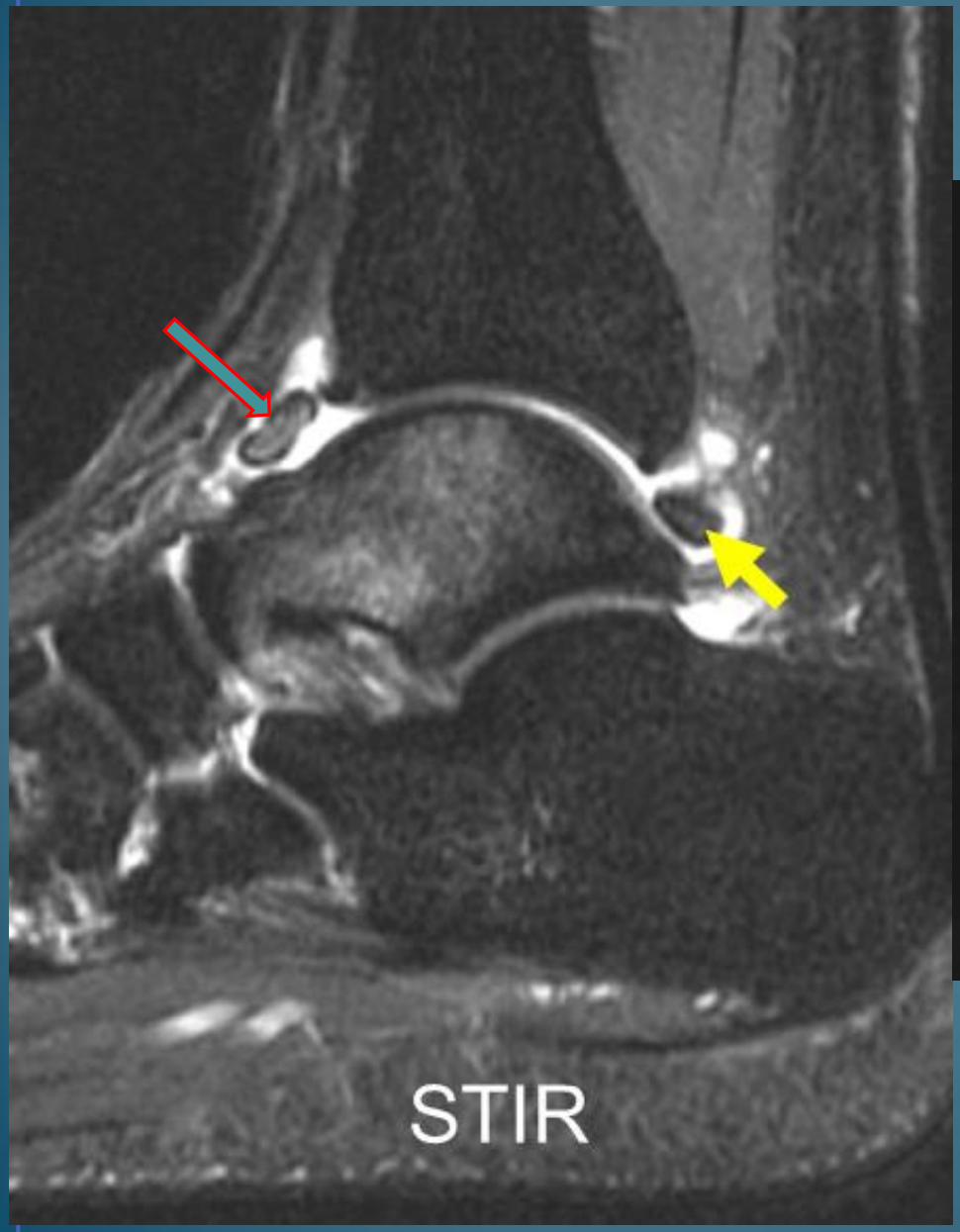
Diagnosis of ankle arthritis

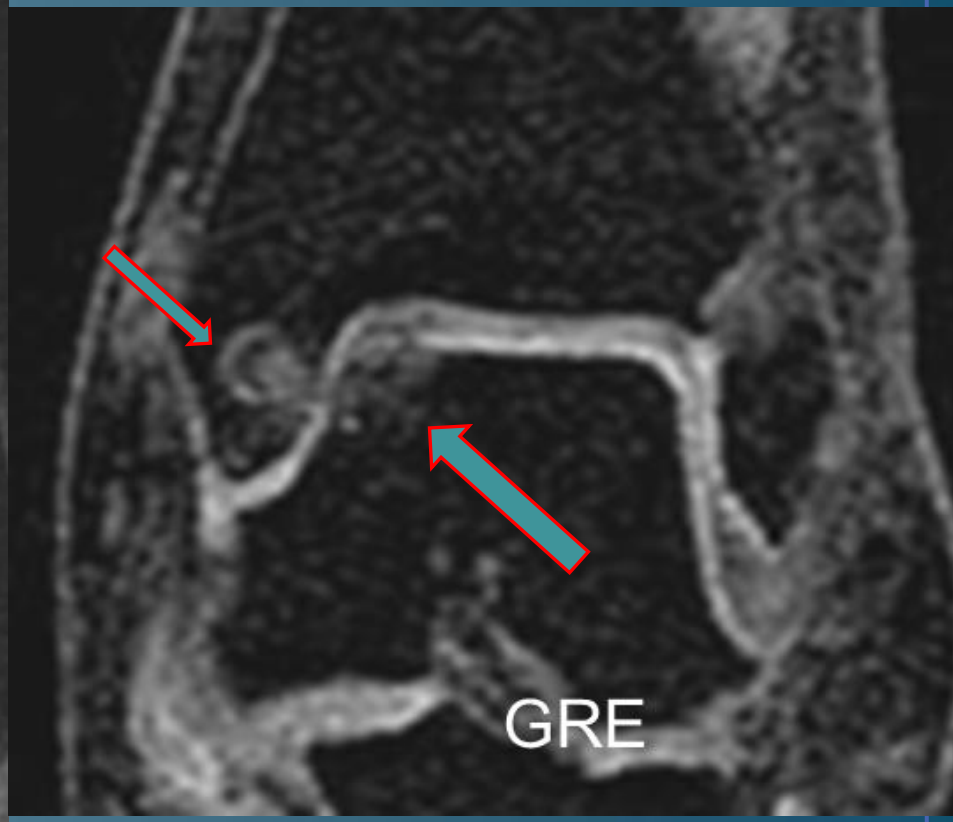
- Physical findings
- X ray
- CT and MRI

- X ray
  - asymmetric cartilage space loss
  - subchondral sclerosis and cyst
  - Osteophytosis, intra-articular loose body

Osteochondral Fracture

- MRI : early detection
  - Morphological changes of cartilage (thickness and signal)
  - subchondal trabecular thickening, cyst
  - subchondral BME, small osteophyte


STIR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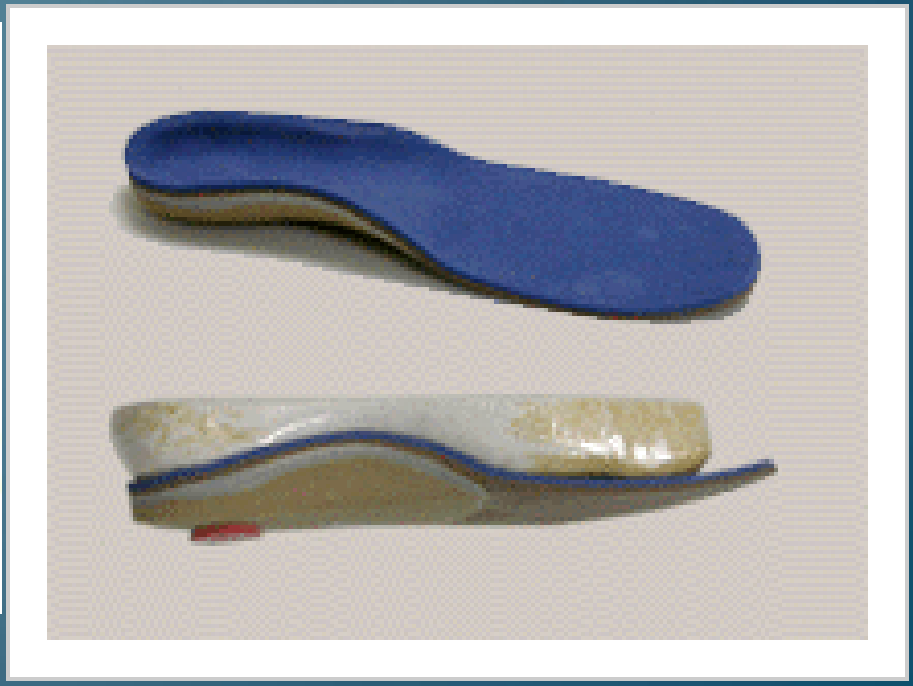
Treatment

- Activity modification
- Wt control
- NSAIDs
- Corticosteroid injection
  - 2달 정도의 단기 효과
  - 3달 이상 간격 두고 주사
- Hyaluronic acid Intraarticular inj

- **Foot orthosis**: 후족부의 정렬 회복, 특정 관절면의 자극을 감소
- **Shoe modifications**
  - 발목과 후족부의 가동성을 줄임
  - High top shoe with stiff midsole (extended steel shank) and Rocker bottom sole
  - Proper wedge and SACH
- **AFO or lace-up ankle support**
- T-strap double-metal upright AFO
- PTB- AFO

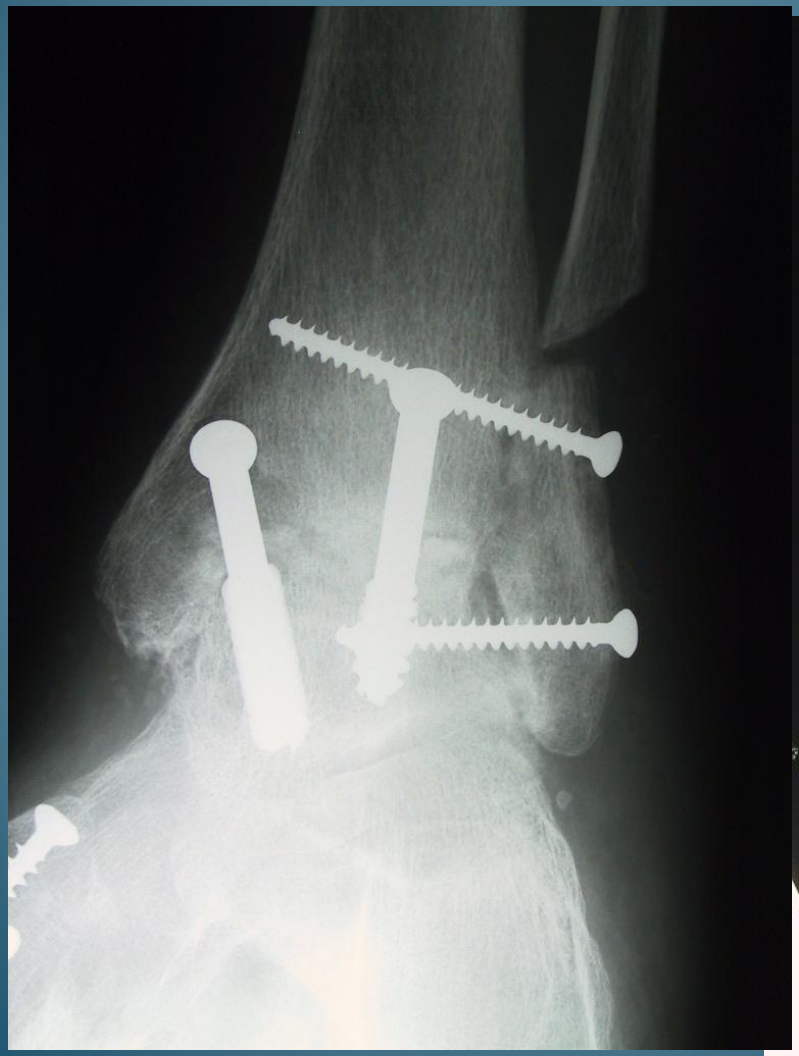
Care for the mild ankle arthritis

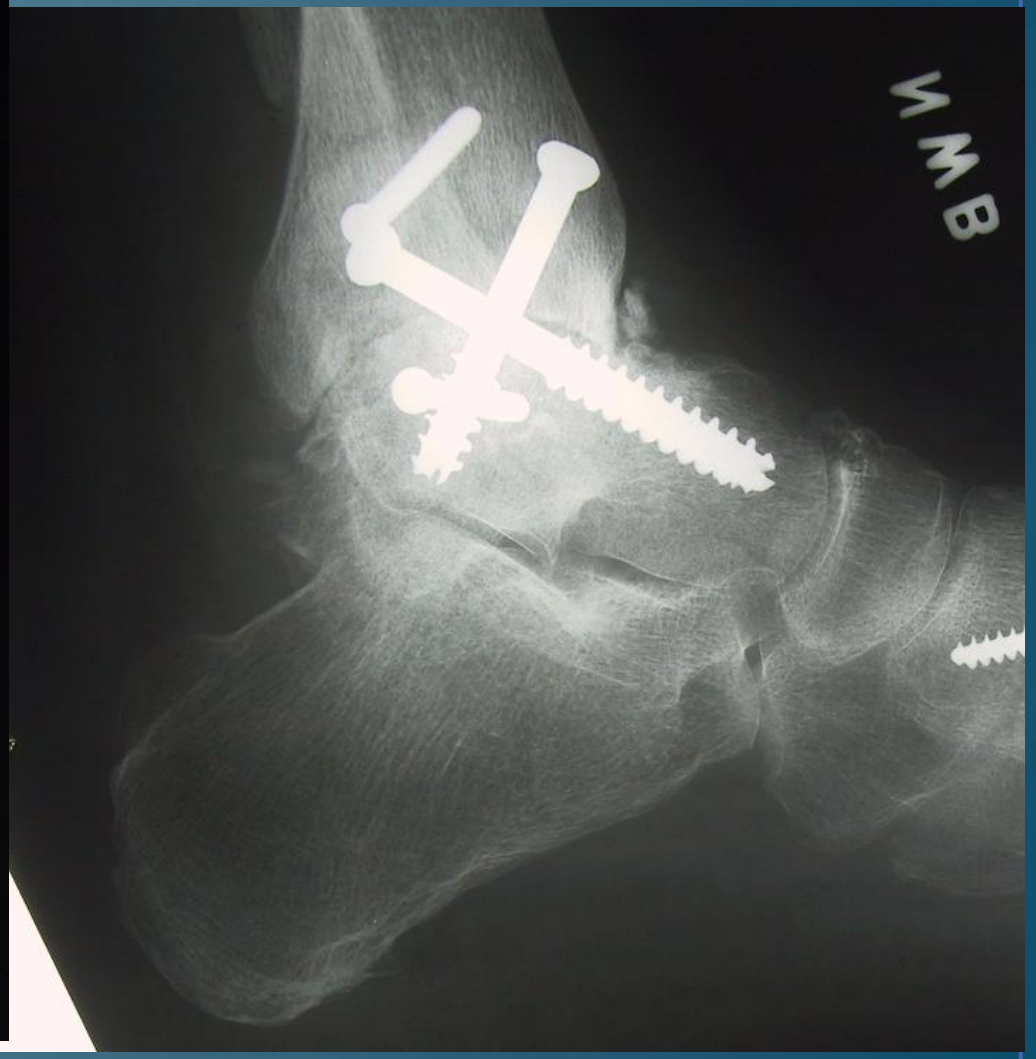
- for realigning of ankle jt and Wt redistribution
- Extra depth shoe + Custom molded foot othosis



- Surgery
  - Debridement and Distraction arthroplasty
  - Corrective osteotomy
  - Arthrodesis
  - Arthroplasty
  - Total ankle replacement

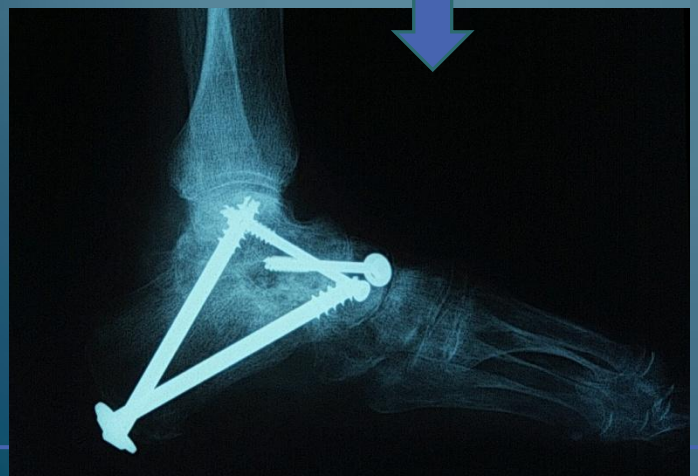
족관절 유합술

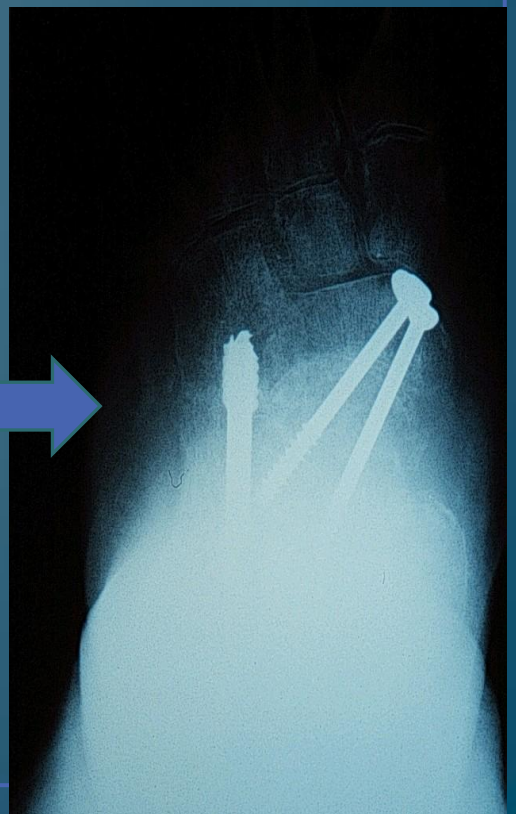




삼중 관절 유합술

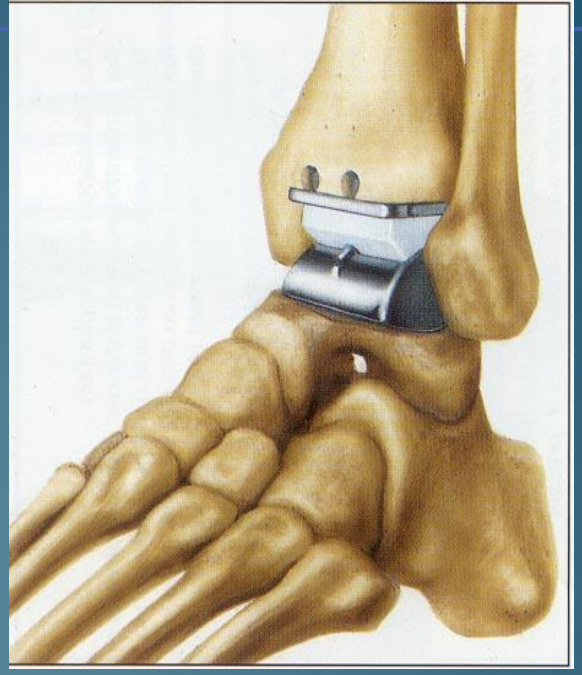
A ***triple arthrodesis*** consists of the surgical fusion of the talocalcaneal (TC), talonavicular (TN), and calcaneocuboid (CC) joints in the foot

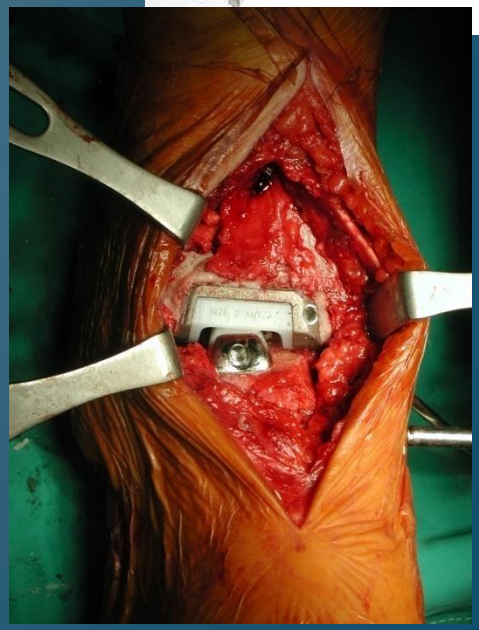




관절경 시술

인공 관절





Less common disorders

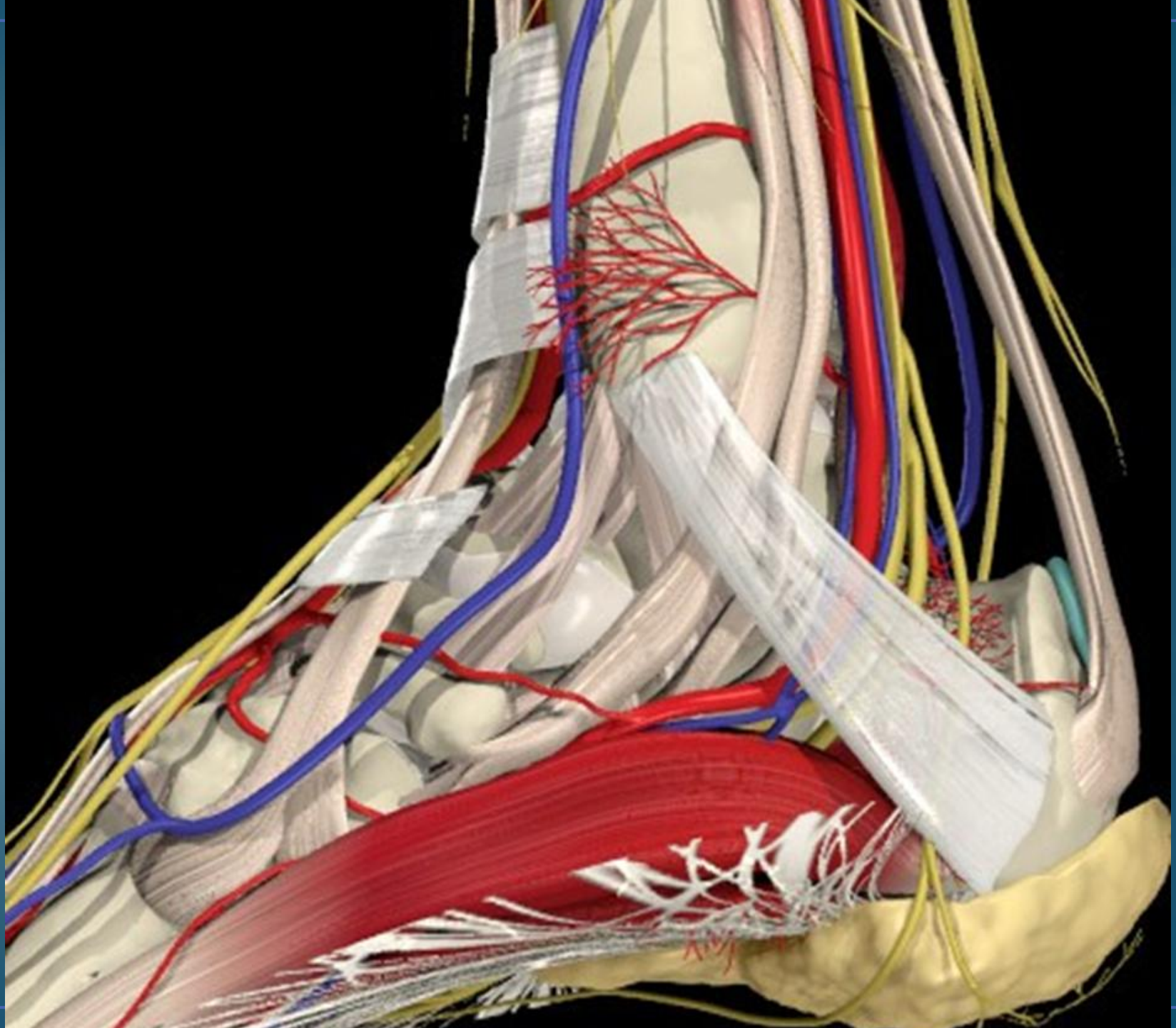
Anterior impingement SD

- Exostosis: Tibial spur & talar beak
  → impingement

Tarsal tunnel SD

- Tarsal tunnel
  - b/w med Malleolus and post tubercle of talus, med aspect of calcaneus
  - Covered by flexor retinaculum

  - 지나가는 구조물: Posterior tibial nerve, artery, vein, Tendon of TP, FHL, FDL,
    - 이 터널내에서 PT nerve가 내,외측 가지로 분지



Tarsal tunnel SD

- Def.
  - TP nerve가 족근관내에서 눌려서 나타나는 여러 가지 증세들
- 원인
  - 신경 내부의 원인: 말초 신경염, 말초 혈관 질환, 당뇨병성 신경병증, 신경초종
  - 신경 외부의 원인: 결절종, 지방종, 외상, 정맥류, tarsal coalition
  - Unknown origin

- Dx of TTS
  - P/Ex : tinel sign?, mass ?, distribution of abnormal sensory area ?
  - X ray: 뼈의 이상 없음- coalition, bony spur, non union…..
  - MRI : 깊은 곳까지 잘 보임.
  - US : mass, ganglion
  - EMG: NCV of med and lat plantar nerve, needling on foot muscles

- Tx
  - Conservative
    - 대부분의 치료 방법
    - Medication
    - Steroid injection
    - Anti depressants
    - PT modalities
  - Surgery
    - 신중을 기해야 함.
    - Mass 가 확실히 신경을 누르는 경우에만

Traumatic synovitis-1

- Any ankle injury와 동반 가능
- 증세: ankle jt pain and swelling, LOM

- 원인:
  - 충분한 휴식과 치료 없이 다시 운동 복귀
  - 초기에 과도한 체중 부하


GUESS
CRPS (Complex Regional Pain Syndrome)
복합부위통증증후군

Deformities of hindfoot

Chartcot-Marie-Tooth Disease (CMT)

- 1886년 Chartcot & Marie와 영국의 Tooth 에 의해 처음으로 기술
- 일차적으로 운동 신경을 침범, 원위에서 근위부로 올라오는 운동 기능 장애 유발

- 진행성

- 발병율: 일년에 1/2500명
- 미국에서 가장 흔한 inherited neuropathy

Chartcot-Marie-Tooth Disease (CMT)

- Herediatary motorsensory neuropathy (HMSN)

- Inherited degenerative disorder in central and peripheral nervous system
  - Muscle atrophy
  - Loss of proprioception

- 발을 가장 먼저 침범, 가장 심하게 침범

Cause of CMT Dz

- Pathology : Myelination ºì^ì¸
- Unknown : Gene mutation….

Classification of HMSN

- By Dyck et al., based on electrophysiologic properties and histopathology
- Type I ~ V

- Two main type
  - HMSN 1 : primary peripheral demyelinating neuropathy
  - HMSN 2 : primary peripheral axonal neuropathy

PTTD

(posterior tibialis tendon dysfunction)

PTTD

- Stage 1: 건염, 건초염 증세, no planovalgus deformity
- Stage 2: 건염, 건초염 증세, planovalgus deformity (+), flexible

- Stage 3: planovalgus deformity (+), fixed
- Stage 4: fixed planovalgus deformity + valgus tilt of talus

PTTD에 대한 비수술적 치료

- PTTD stage 1
  - 4-6주간 단하지 석고 붕대나 보조 신발 그리고, 이후에 재활 운동
  - NSAIDs : 염증 반응과 통증 감소
  - Foot orthosis

- Stage 2
  - controlling longitudinal arch and heel valgus
    - Foot orthosis
    - AFO, Supramalleolar orthosis
    - Shoe modification: extended medial counter or medial heel wedge
  - For acute pain : immobilization

- Stage 3
  - AFO, hinged
  - Supramalleolar brace

  - Fixed heel valgus 심하면 보조기 치료에 반응이 적다

- Stage 4
  - Non-hinged AFO

PTTD 수술적 치료

- 비수술적 치료로 반응이 없을 때 수술을 고려

- Stage 1 : 활액막 절제술, 건 감압술

- Stage 2 :
  - 활액막 절제술, 건 감압술 및 일차 봉합
  - 필요시 건이전술
  - 변형이 있으면 절골술과 관절유합술 고려
  - 첨족이 동반 시, 후방 근 그룹 연장술

- Stage 3
  - 보통, 관절 유합술 시행
    - Single, triple
  - 첨족에 대해 후방 근 그룹 연장술

- stage 4
  - Ankle Mortise 내에 talus valgus deformity 있으므로 talocrural jt를 포함한 수술
    - talar valgus without talocrural jt degenerative change – 내측 삼각 인대 봉합술, 내측 전위 족골 절골술
    - talar valgus with talocrural jt Degenerative change – 전거골 관절 유합술 시행. 추가로 전 족근 관절 치환술이나 과상 절골술을 삼중 관절 유합술과 연계.

Take Home Messages

- Hindfoot Common disorders in the eldly
  - Degenerative Dz : Ankle arthritis
  - P. fasciitis, heel pad atrophy
  - Post-traumatic synovitis
  - Deformities : CMT, PTTD

Thank you for listening carefully !!!