

“발목이 아프면 모두 관절염?”

: 발목관절 주위 통증의 감별진단

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감별진단의 기본 원칙 1:

- pain/tender area?
- aggravated by movement/ weight-bearing?
- worsen with immobility?
- associated with LOM?
- accompanied by swelling and/or erythema?
- associated systemic complaints?

감별진단의 기본 원칙 2:

➤ STEP 1: "통증" 부위 → workshop

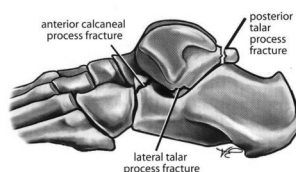
- 국소적 압통 vs. referred pain
- with inflammation or without
- other signs (ex. LOM, deformity)?

➤ STEP 2: history taking focused on specific DDx. point

➤ STEP 3: functional evaluation

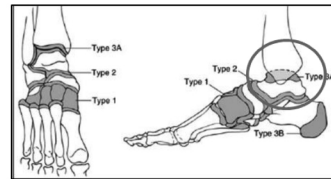
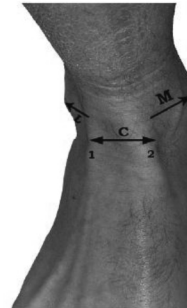
Causes of 'Problem Ankle' After Sprain

Atypical ligament injuries	Bony abnormalities	Tendon injuries	Other soft tissue & neural abnormalities
② Chr. lateral ligament instability(ATFL>CFL) → OA Medial sprain Syndesmosis sprain Subtalar sprain	OCD of Talar dome Impingement(ant, post, anterolateral) Hidden fractures	Peroneal tendon lesion Tibialis post. tendon lesion	<u>Inadequate rehabilitation</u> ① Chronic synovitis Sinus tarsi syndrome CRPS type1

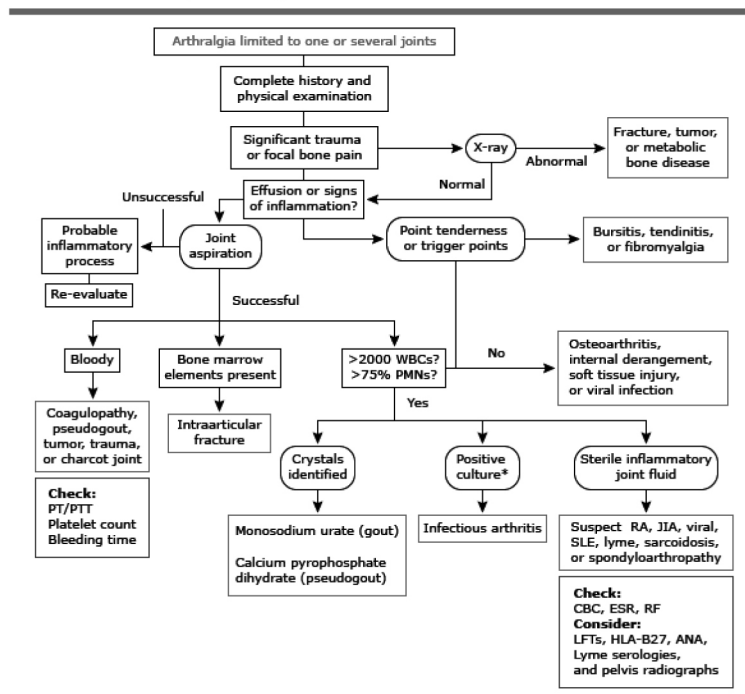


Anterior Ankle Pain

- Ankle joint arthritis
(OA, inflammatory arthritis etc.)
- after sprain : Traumatic synovitis
- Osteochondral lesion on talar dome
- Syndesmosis(AITFL) sprain
- Anterior impingement syndrome
- Tenosynovitis(TA, EDL...)
- If DM, neuroarthropathy(Charcot joint)



Evaluation of oligoarthritis



• Traumatic synovitis

- will occur with any ankle injury
- causes: excessive early weight-bearing, insufficient rehabilitation, chronic mild instability
- ankle pain & swelling & LOM
- TX: steroid IA injection & active ROM ex. of ankle

• OCD of talar dome(head)

- not uncommon after compression & inversion injury(jump landing...)
- medial >> lateral side
- sometime later with unremitting ankle pain/catching after good rehab.
- tenderness of talar dome
swelling, LOM

CT/MRI grading

Grade I: subchondral fx.

Grade II: chondral fx.

Grade IIa: subchondral cyst

Grade III: chondral fx.
seperated, not displaced

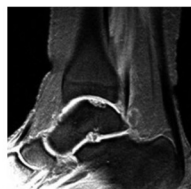
Grade IV: chondral fx.
seperated, displaced



Conservative Tx

- avoid painful activity
- encourage bicycle with low resistance

comprehensive
rehab. after
arthroscopic op.,

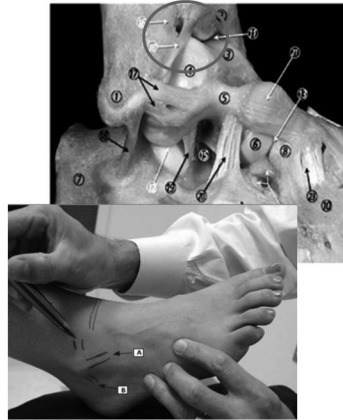


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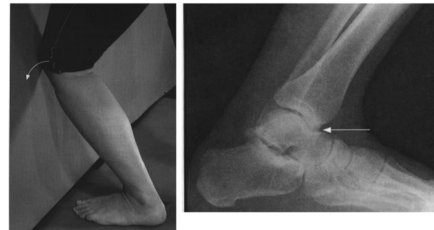
- **Syndesmosis(AITFL) sprain**

- 1-5% of severe inversion/PF trauma
- Tenderness, ER test, calf squeezing test
- Tx: No instability → 비수술적치료,
(그러나 치료 기간이 2배 이상 필요)
instability → screw fixation op.



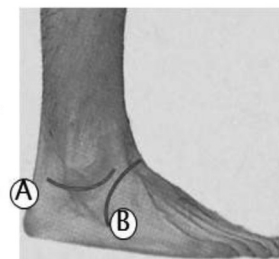
- **Anterior impingement syndrome**

- 발목 DF 시 pain(lunge test), PF 제한
- Bony, soft tissue impinge
- 스포츠(축구, 농구, 발레, 격투기...)
- Tx: 스테로이드주사, 운동치료
heel lift....
if bone spur → op.



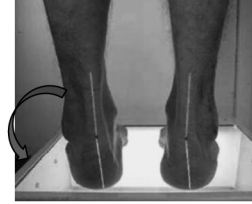
Anterolateral/Lateral Ankle Pain

- Subtalar arthropathy(A)
- Midtarsal arthropathy(B)
- Lateral ligament sprain(ATFL>CFL)
- Anterolateral impingement syndrome
- Sinus tarsi syndrome
- Tendinopathy, subluxation(peroneals)



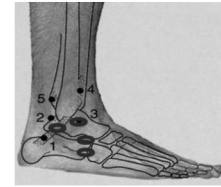
- **Lateral ligament sprain (ATFL>>CFL)**

- “the problem ankle” : persistent pain, 6wks after sprain
- chronic instability → lead to biarticular laxity(talocrural & subtalar)
- ATFL&CFL 손상되면 rearfoot inversion & IR 증가



- **Anterolateral impingement syndrome**

- tender, intermittent catching sense
- trapped ATFL(thickened, degenerated)

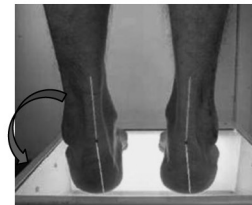


- **Sinus tarsi syndrome**

- lined by synovial membrane,
- contain osseous lig.,blood vessel, connective tissue

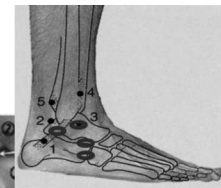
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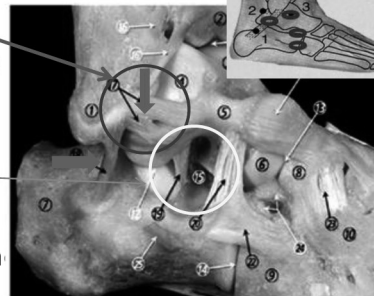
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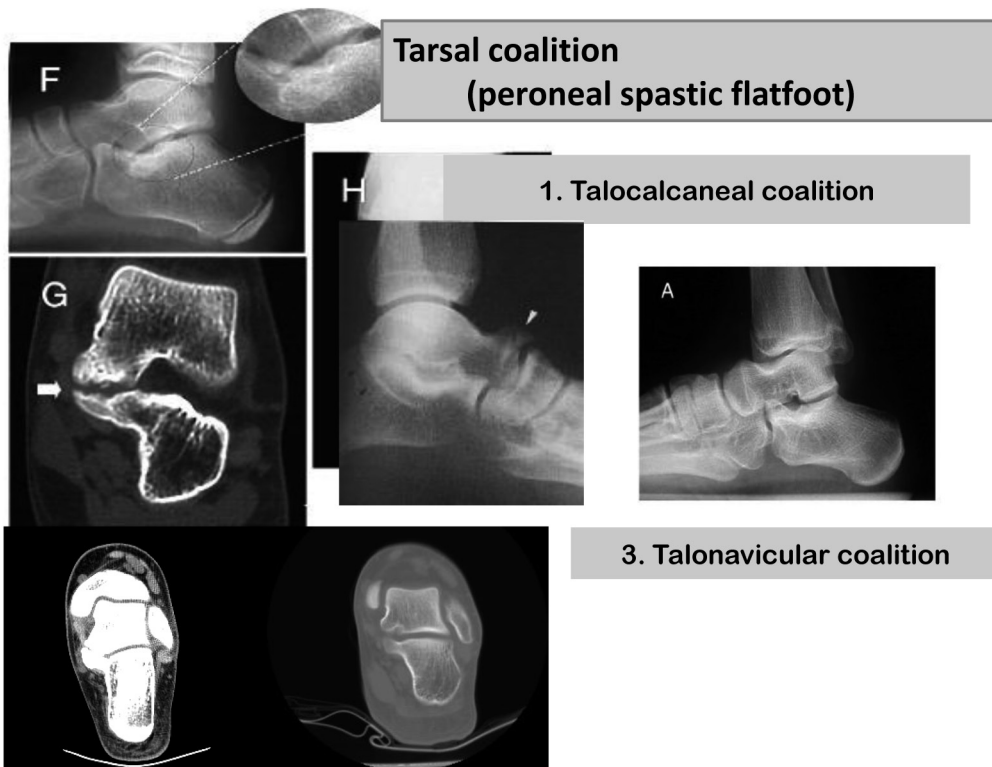
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• Sinus tarsi syndrome

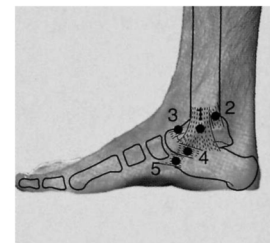
- chronic overuse secondary to poor biomechanics(excessive pronation...)
- inversion injury Hx.(>70% of pts.) or high jump injury
- low-grade inflammatory synovitis feature
 - poorly localized, but anterolateral ankle pain
 - more severe pain/stiffness in the morning
 - exacerbated Sx. on uneven ground
 - ankle ROM – free but, subtalar stiffness
 - painful forced passive inversion of STJ → ligament injury!
- Dx: diagnostic sinus tarsi injection(1% lidocaine 1ml)→no pain during hop
degenerative change of STJ on X-ray
increased signal in sinus tarsi on MRI
- Tx: rehab. (STJ mobilization, proprioceptive tr., steroid injection, biomechanical correction ...)

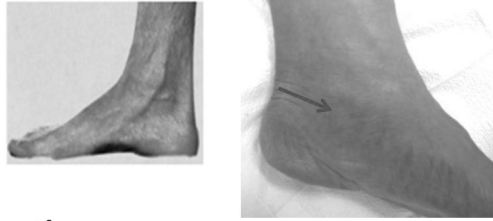




Medial Ankle Pain

- **Tendinopathy (TP, FHL), PTT insufficiency**
- **Accessory navicular pain with/without PT tendinopathy**
(Os tibiale externum (Os navicularis syndrome))
- Posterior impingement syndrome
- Deltoid ligament sprain
- Tarsal tunnel syndrome - med. calcaneal n. entrapment
- Stress fracture (medial malleolus, calcaneal, navicular)





- **Tibialis posterior tendinopathy**
- **Accessory navicular pain with/without PT tendinopathy**
(Os tibiale externum (Os navicularis syndrome))

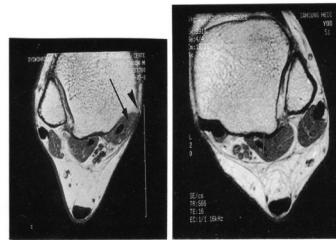


Fig. 4. Foot MRI demonstrated non-visualization of posterior tibial tendon(✓), medial malleolar spur(↖) on the right side and normal findings on the left side.

- **special standing tests**
 - single/double heel raising



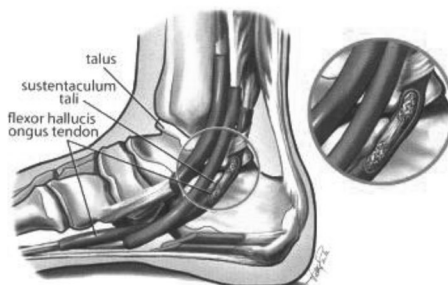
• Accessory navicular pain

- = prehallux, os tibiale externum
- 10-14%
- symptomatic in childhood or early adulthood
- Type I: sesamoid bone in TP tendon
Type II: articulating accessory ossification center with navicular
Type III: fused
- Tx.



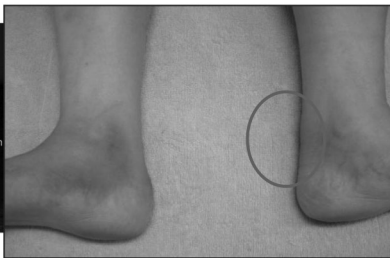
• Flexor hallucis longus tendinopathy

- repetitive extreme PF position, toe-grip(ballet dancer, high heel...)
- often associated posterior impingement syndrome
- posteromedial pain on toe-off or forefoot wt-bearing
aggravated by resisted flexion of 1st toe or stretch into DF



Posterior Ankle Pain

- Achilles tendinopathy (midportion)
- Insertional Achilles tendinopathy
- including retrocalcaneal bursitis & Haglund's disease



- Posterior impingement syndrome

- **Posterior impingement syndrome**

- enlarged post.tubercle of talus, os trigonum(10% of population)
- maximally PF ankle(ballet dancer, gymnast, footballer...)
after PF/inversion injury
- pain, tenderness on posterior ankle
- diagnostic lidocaine injection around post. talus
→ no pain during impingement test again!



Differential diagnosis of foot and ankle pain in the young athlete

Condition	Mechanism of injury	Location of pain	Radiograph
Talar pain			
OCD talus, posteromedial	Inversion with plantarflexion	Posteromedial talus in dorsiflexion	AP view of ankle, maximal plantar flexion
OCD talus, anterolateral	Inversion with dorsiflexion	Anterolateral talus in plantarflexion	Mortise view in ankle dorsiflexion
Stress fracture, talus	Chronic stress (running, dancing)	Rearfoot pain with activity	AP, lateral, and mortise views of ankle; may be better seen with MRI or CT
Lateral ankle pain			
Ankle sprain (lateral ligaments)	Inversion of ankle	ATFL, PTFL, CFL	AP, lateral, and mortise views of ankle
Sinus tarsi syndrome	Severe, recurrent ankle inversion sprain	Lateral ankle (posterior and inferior to ATFL)	Stress radiographs of the ankle
Peroneal tendon injuries	Acute ankle sprain	Peroneal tendons (superior to lateral malleolus)	AP, lateral, and mortise views of the ankle (to exclude bony injury); Consider MRI
	Chronic ankle instability		
	Peroneal subluxation		
Os peroneum		Lateral plantar cuboid	AP, lateral, and mortise views of the ankle; AP, oblique views of the foot
		Calcaneocuboid articulation	
L4 radiculopathy	Disc herniation	Quadriceps	Consider MRI spine (after EMG/NCS)

Condition	Mechanism of injury	Location of pain	Radiograph
Medial ankle pain			
Flexor hallucis longus injuries	Extreme plantar flexion	FHL tendon (behind the medial malleolus); may radiate to the medial arch	AP, lateral, and mortise views of the ankle; lateral ankle in full equinus
Flexor digitorum longus injuries	Excessive pronation	Medial plantar surface of FDL tendon	Not necessary for diagnosis
	Increased effort of plantar flexion		
Os tibiale externum	Direct pressure	Navicular tuberosity	AP, lateral, and oblique views of the foot
	Direct trauma		
	Eversion ankle injury		
Tibialis posterior tendon dysfunction	Increased stress along TPT (eg, dancers, skaters, running sports)	Along TPT, usually distal to the medial malleolus	AP, lateral foot; MRI depending upon stage of disease
S1 radiculopathy	Disc herniation	Posterior leg and foot	Consider MRI spine (after EMG/NCS)
Tarsal tunnel syndrome	S/P fracture or dislocation of talus, calcaneus, or medial malleolus	Plantar foot; distal foot toes; heel	Consider MRI ankle (after EMG/NCS)

Differential diagnosis of foot and ankle pain in the young athlete (continued)

Condition	Mechanism	Location of pain	Radiograph
Anterior ankle pain			
Anterior tibialis injuries	Direct pressure	Anterior tibialis tendon (anteromedial ankle)	Not necessary for diagnosis
	Running on hard surface		
	Overstriding		
	Excessive pronation		
High ankle sprain	Hyperplantar flexion	Distally between the tibia and fibula	Plain radiographs of the ankle
	Forced external rotation		
Posterior ankle pain			
Achilles tendinitis	Repetitive microtrauma	Achilles tendon	Lateral weight bearing heel (to exclude bony abnormalities) MRI; ultrasonography
	Improper footwear		
	Errors in training technique		
Achilles tendon rupture	Sports activity	Calf	Ultrasonography in dorsiflexion and plantarflexion
	Trauma		
Os trigonum	Hyperplantarflexion	Posterolateral talus	Lateral ankle; lateral ankle in plantar flexion