

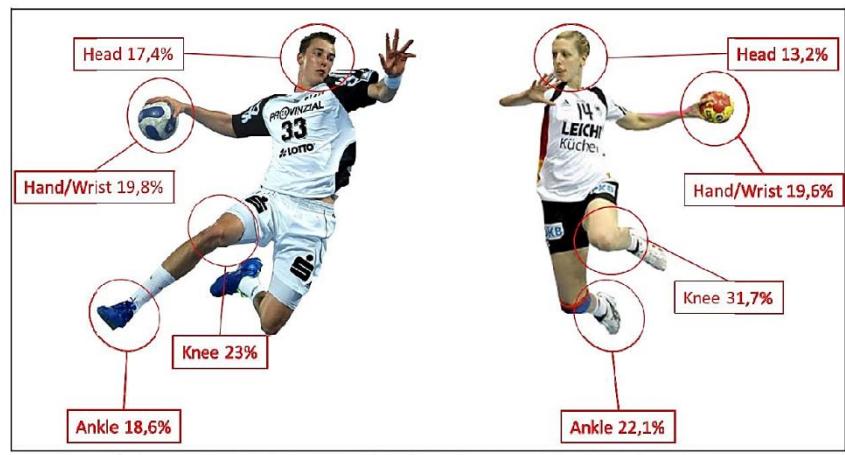
Ankle injuries in handball



Pietro Spennacchio, MD
IRCCS Policlinico San Donato Milano

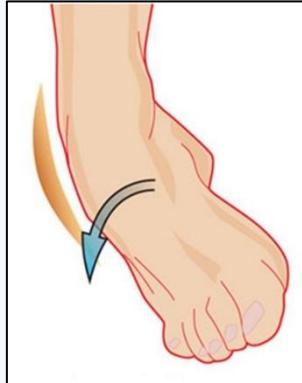
Epidemiology

"Science and analytical expertise in handball" - EHF Scientific Conference 2011



Localisation of acute injuries among male and female athletes (n 8520; 14-45)

- high injury rate
- overall incidence of acute injuries: 2/1000h
- 320.000 handball injuries / year



lower extremities non contact injuries (knee and ankle sprains)
→ leading lesions

→ female athletes more vulnerable

most common injury location (17.4%/132) - Qatar Handball World Championship 2015

Ankle Injuries in Handball

injury mechanism



«hard one-leg landings»

«side-step cutting technique»

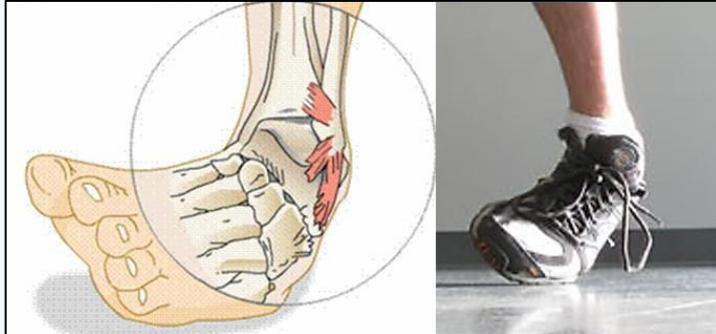
combination of inversion/eversion + plantar/dorsiflexion + rotational forces

→ high loads to ankle structures

Lindner et al. - J Biomech 2012
Kristianslund et al - Am J Sports Med 2013

ankle sprain

~25% of all sports injuries - Klenermann et al JBJS Br 1998

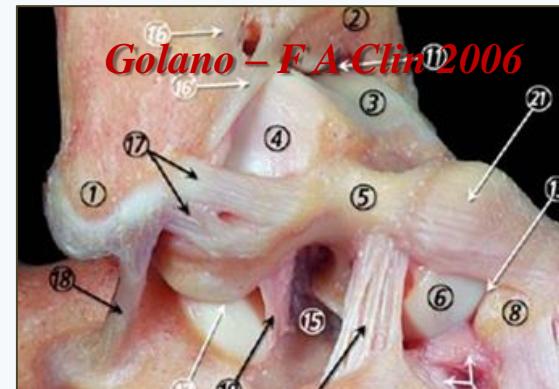


forced plantarflexion and inversion motion

→ traction lesions on the lateral ligamentous complex

Inversion injury

- ATFL first damaged ligament isolated ~65% ankle lig injuries
- Combined ATFL + CFL: 15-25%
- Isolated CFL: 1%



Injury classification

grade I (mild) – II (moderate) – III (severe)

Kannus & Renstrom JBJS Am 1991

ankle lateral ligament injury

diagnosis and treatment

simple sprain

Grade I



real instability

Grade II / III



«early» physical examination **not reliable**

bony tenderness & inability to weight bear
→ X-ray examination : ? fracture



Delayed physical examination

- Haematoma discolouration
- Localized pain on palpation ATFL
- Positive anterior drawer test

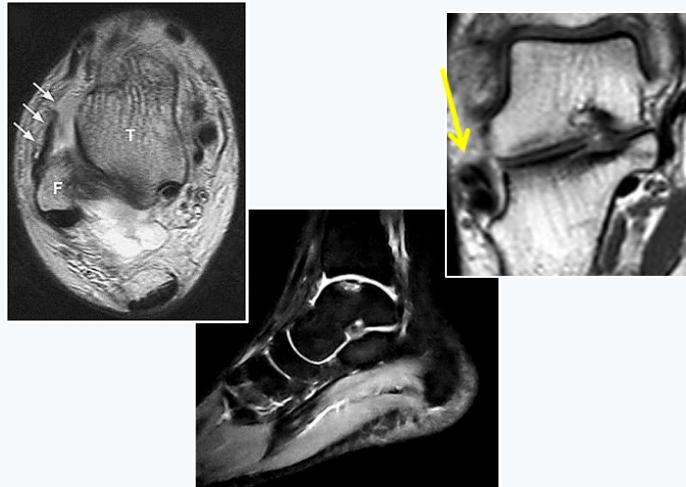


sens 96%, spec 84% for presence/absence ligament rupture

Van Dijk et al Br J Sports Med 2002

ankle lateral ligament injury

additional investigations



- ligament rupture confirmation

+

- associated injuries:

post-traumatic OCD, tendon disorders



- **painful in the acute setting**
- **controversy** on values interpretation
 - **sens ≈ ADT**

→ limited influence on tt strategy



ankle lateral ligament injury

treatment

1) «SIMPLE» SPRAIN → «aggressive» functional treatment
early mobilization and return to sporting activities following pain and swelling

2) LATERAL LIGAMENT RUPTURE (grade II, III) → functional tt



proper ligamentous healing: controlled RoM
(semirigid / lace-up brace protection for 4-6 wks)

a) R.I.C.E therapy: **4-5 days** to reduce pain and swelling



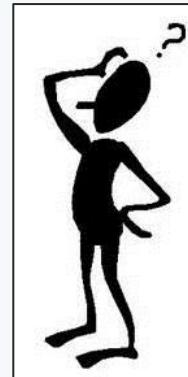
b) physiotherapy **4-6 weeks**



→ return to full activities between **4-8 weeks** after injury

acute lateral ligament rupture

surgery vs conservative treatment



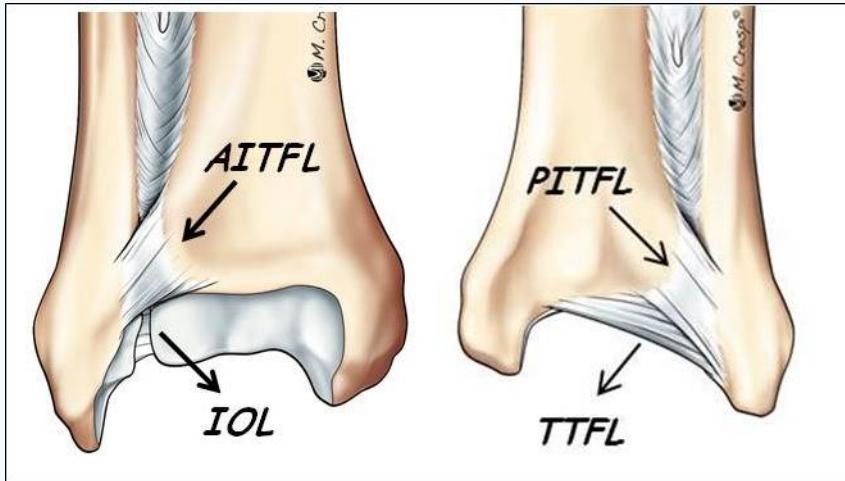
no clear superior approach

Kerkhoffs et al - Cochrane Syst Review 2007

lower mechanical laxity with operative t
→ acute reconstruction preferred in professional athletes

Van den Bekerom et al – KSSTA 2013

Syndesmotic injury



1 to 20% of all ankle injuries

Rammelt et al - F A Clin N Am 2008

- «high ankle sprain»
- isolated syndesmotic sprain with no concomitant fractures
 - most frequent variant in athletes



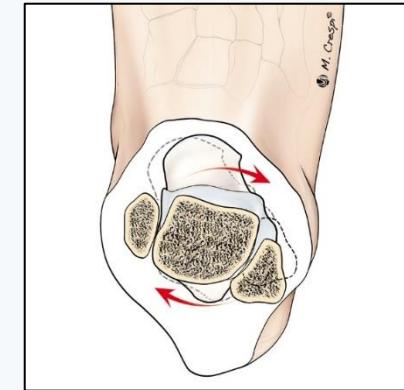
Syndesmotic injury

diagnosis and tt

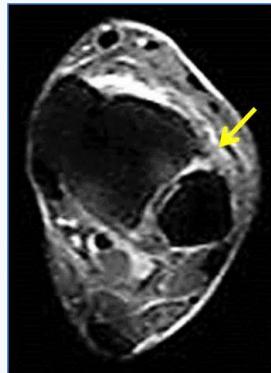


Injury mechanism

Forced external rotation,
ankle dorsiflexion, foot
pronation



w-b mortise



93 < sens < 100%;
93 < sp < 100%

Vogl et al – Invest Radiol '97
Takao et al – JBJS Br '03

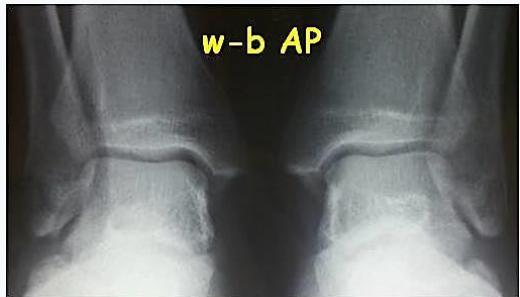
Stable syndesmotic injuries → conservative treatment

- **86-100%** good to excellent outcome
- recovery period highly variable (**6-8 wks**), longer than lateral ankle injuries



Syndesmotic injury

latent instability

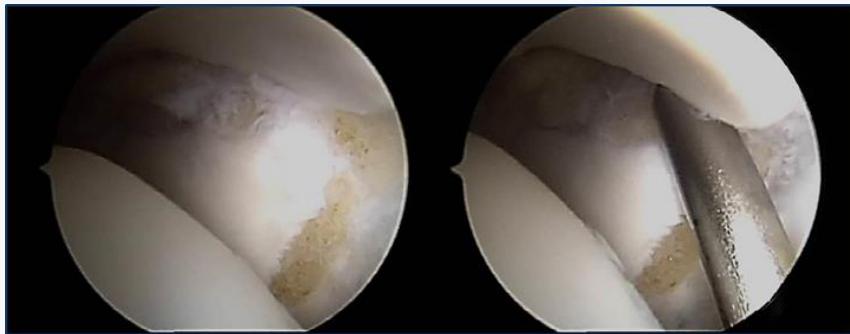


normal mortise on radiograph

+

suspicion of dynamic instability

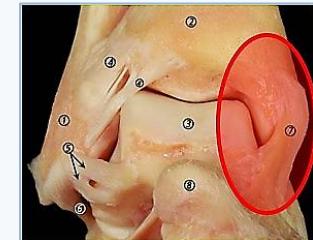
- clinical picture & MRI
- association with deltoid ligament injury



Minimizing risk of chronic problems

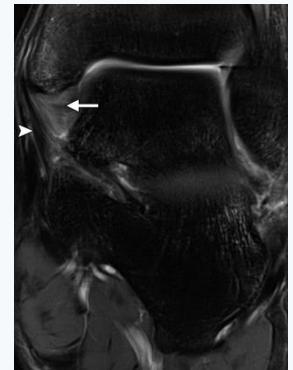
Wolf BR et Amendola A - Current Opinion in Orthopaedics 2002

deltoid ligament injury



forced external rotation / pronation / abduction
→ landing on somebody else's foot

- isolated injury → **3% / 281** acute ankle sprains (partial lig tears)
Brostrom - Acta Chir Scand 1964
- associated injury w syndesmosis / lat lig complex / fractures



Treatment

- Isolated lesions → functional treatment → RTS **6-8 w**
- Combined lateral and deltoid ligament → as a lateral ligament injury



deltoid ligament + syndesmotic injury
potential surgical indication for early stability and rehabilitation

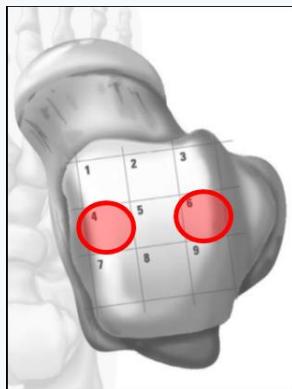
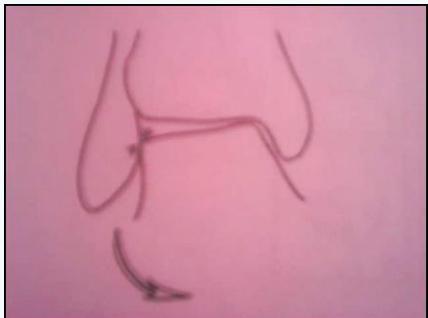
Mc Collum et al – KSSTA 2012

talar osteochondral lesion



common injury following ankle sprain
→ 50% acute ankle sprain and fractures

Van Buecken et al, Am J Sports Med 1989



"Centromedial and centrolateral regions
are the most common locations"

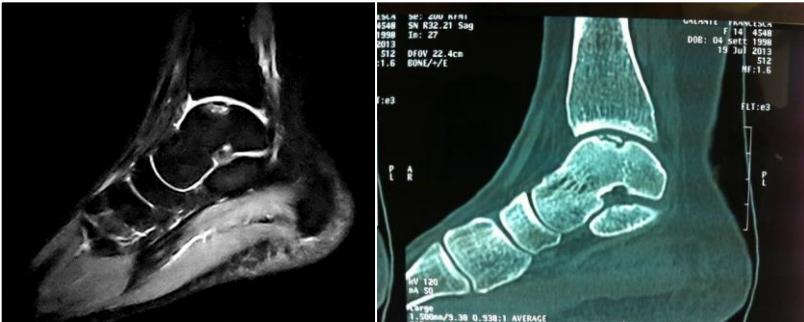
Raikin et al, FAI 2007; Orr et al, FAI 2012



diagnosis
→ difficult in the acute setting

talar osteochondral lesion

diagnosis & tt



CT / MRI

• = sensitivity

- CT for preop plan (location and size)

Verhagen et al - JBJS Br 2005

TREATMENT

- conservative tt (rest or cast) → **29-69%** successful rate



- OCD > 15mm / young athlete / (sub)acute setting
→ sx repair (fixation); RTS **3-4** months
- arthroscopic excision +/- BMS procedure
RTS **4-6** months; **63-79%** preinjury level

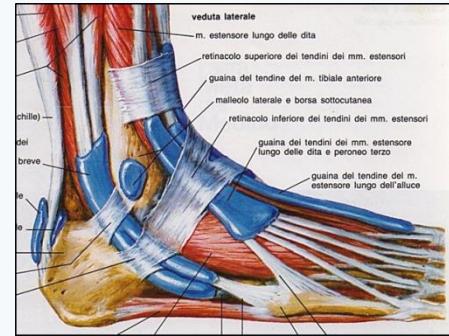


Arthroscopy '99, KSSTA 2010

peroneal tendon dislocation

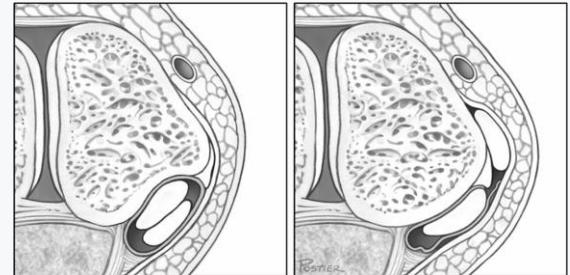
0,3 - 0,5% ankle traumatic events events

Roth et al - Br J Sport Med 2010



Injury mechanism

forceful ankle dorsiflexion + peroneal mm eccentric contraction
→ rupture of the superior peroneal retinaculum

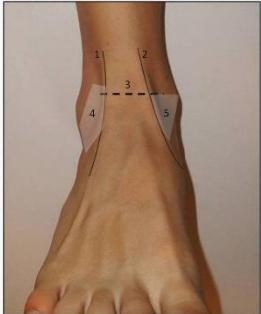


retrofibular pain / snapping sensation
→ high suspicion

surgical tt → high satisfaction rate, RTS **3 months**

Van Dijk et al, KSSTA 2015

impingement syndrome

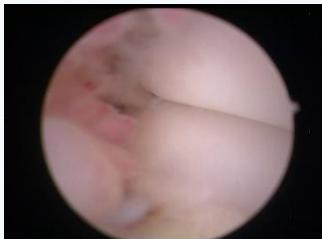


chronic painful condition secondary to sprain or repeated microtrauma

→ Clinical diagnosis
pain reproducible during physical examination

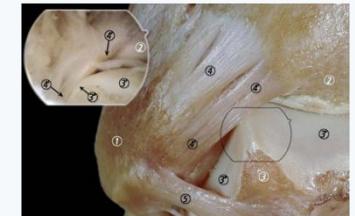
Additional investigation

- **bony** impingement (osteophytes, os trigonum)



- **soft tissue** impingement
(chronic synovitis, scar tissue ATFL / AITFL)

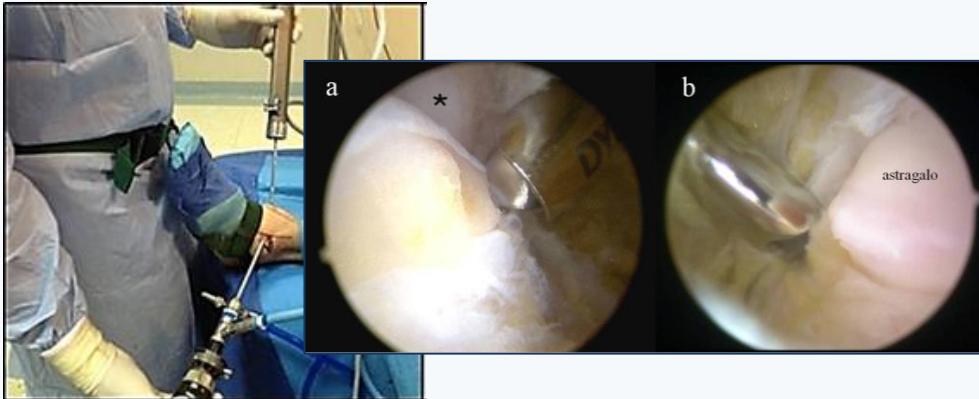
Golano – F A Clin 2006



impingement syndrome

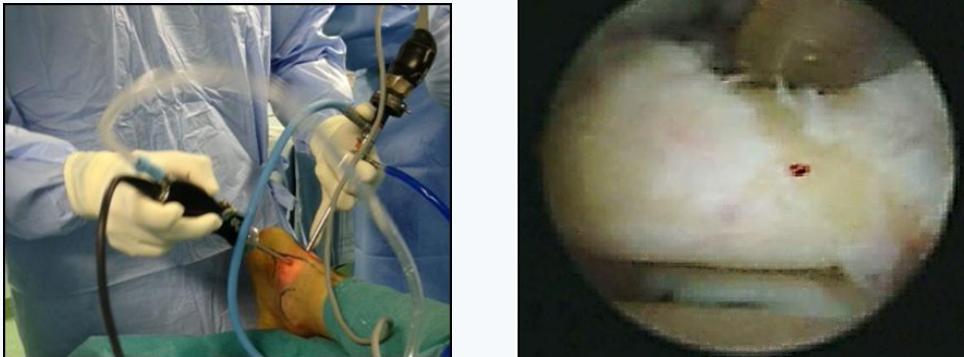
treatment

if **conservative tt fails** → arthroscopic treatment
high percentages good to excellent satisfactions



RTS → 2 months

Murawski et al, Am J Sports Med 2010
Baums et al, KSSTA 2006



RTS → 2 months

Calder et al, Am J Sports Med 2010
Zwiers et al, Arthroscopy 2013

take home messages



- ✓ *injury mechanism gives major clues for diagnosis*
- ✓ *delayed physical examination is of utmost importance for a practical diagnosis of lateral ligamentous injuries*
- ✓ *routinely perform an MRI in professional players*
- ✓ *first injury is a recognized risk factor*
- ✓ *bad luck is not the main cause!*



Thank you !



Pietro Spennacchio, MD
IRCCS Policlinico San Donato, Milano (Italy)

pietrosPennacchio@gmail.com