Société Française des Masseurs Kinésithérapeutes du Sport

Lateral Ankle Sprain

3. Clinical examination and Field management

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Clinical examination
When and what?

On field

VS

Off field

On field Examination

- In an emergency (rapid)
- Eliminate criteria of severity
- Consider associated lesions
- Direct the treatment
- Apply first aid

566 *Acta Orthop Scand* 1996; 67 (6): 566–570

Diagnosis of ligament rupture of the ankle joint

Physical examination, arthrography, stress radiography and sonography compared in 160 patients after inversion trauma

C Niek van Dijk[1], Ben Willem J Mol[2], Liesbeth S L Lim[1], René K Marti[1] and Patrick M M Bossuyt[2]

Not very acurate: 71%sens and **33% spé** in an emergency

=> Double-check at 3-5 days

Vuurberg et al. *@BJSM* **2018**,Van Dijk et al. *@JBSJ* **1996a-b,** Kerkhoff et al. *@BJSM* **2012**, Lin et al. *@BJSM* **2013**

On field

Anamnesis

(mechanism, localization, paresthesia…)

Observation

(wound, deformity, color, œdema)

Palpation

(Bone, tendon, ligament…)

Prise en charge

(P.OL.I.C.E, NWB , Refer…)

Vuurberg et al. *@BJSM* **2018,** Gribble *@JAT* **2019**

Anamnesis…

- Describe the injury mechanism
- Feeling of "Pop/crac
- Location of pain ++
- History of sprains,
- Imaging or treatment in progress…
- Presence of other red flags

EMA Emergency Medicine Australasia

Emergency Medicine Australasia (2017) doi: 10.1111/1742-6723.12904

REVIEW ARTICLE

Review article: Best practice management of common ankle and foot injuries in the emergency department (part 2 of the musculoskeletal injuries rapid review series)

Kirsten STRUDWICK[1,2,3] Megan MCPHEE,[2] Anthony BELL,[4,5] Melinda MARTIN-KHAN[6] and Trevor RUSSELL[3]

Take the sock / shoe off!

Strudwick et al. *@EMA* **2017**, Tiemestra @AFP **2012**. *@Cur Sp Med Reports* **2005**, Vuurberg et al. *@BJSM* **2018,** Gribble *@JAT* **2019**

Observation/inspection

- Wound, deformity…
- Hematoma /Oedema

  ⇒ *Ligament or bone damage*

- Palpation (bone, tendon, ligament …)

It tes
provide any relevant diagnostic information at the time of injury.

On-field Management of Emergent and Urgent Extremity Conditions

Scott D. Flinn, MD

Flinn S. *@Cur Sp Med Reports* **2005**, Vuurberg et al. *@BJSM* **2018,** Gribble *@JAT* **2019**

Courtousy Dr S. De Jésus

Initial assessment on field

Lack of anatomical/clinical correlation between immediate functional disability and severity of injury (stage 1 or 2 in particular)

But…:

➔ The combination of cracking + localised pain + functional impotence is a positive predictive factor (75%) of ATFL rupture.

Pijnenburg et al. *@JBJS* **2003** Orsoni et al. *@JAT* **2017**

I. Rule out the fracture

- The first serious factor to consider in the event of trauma...

CrossMark

DIAGNOSTIC ACCURACY OF CLINICAL DECISION RULES TO EXCLUDE FRACTURES IN ACUTE ANKLE INJURIES: SYSTEMATIC REVIEW AND META-ANALYSIS

Ingrid Bareldsa, PT,*† Wim P. Krijnen, PHD,* Johannes P. van de Leur, PT, PHD,‡ Cees P. van der Schans, PHD,*§ and Robert J. Goddard, PT, MMT||

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Reprint Address: Ingrid Barelds, PT, Research and Innovation Group in Health Care and Nursing, Hanze University of Applied Sciences, Eyssoniusplein 18, Groningen 9714 CE, the Netherlands

*"The OA(F)R are the **most accurate decision rules** for excluding fractures in the event of an acute ankle injury"*

Stiell et al. *@AEM.JAMA* **1992,1993**, Vuurberg et al. *@BJSM* **2018,**, Barelds et al. *@JEM* **2017**, Gribble *@JAT* **2019**

Ottawa Ankle Rules (OAR)…

Ian G Stiell, MD, FRCPC*
Gary H Greenberg, MD, FRCPC†
R Douglas McKnight, MD, FRCPC*
Rama C Nair, MStat, PhD‡
I McDowell, PhD‖
James R Worthington, MD, FRCPC*

A Study to Develop Clinical Decision Rules for the Use of Radiography in Acute Ankle Injuries

They are reliable and can be used from the age of 5.

1. Impossible to stand and take 4 steps
(i.e. 2 times 2 steps for each foot)

*Sensibility de **92-100%** et specificity **16-51%** with **RV+ 1,23** and **RV- 0,10***

- *More reliable in the first 48 hours, but must be reproduced,*
- *They can reduce the number of images taken by up to 40%.*

Lin et al. *@BJSM* **2013,** Bachman et al. @BMJ **2003**, Dowling et al.*@AEM* **2009**, Barelds et al. **2017**, Beckenkamp et al. **2017,** Libetta et al. *@JAED* **1999**

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A Study to Develop Clinical Decision Rules for the Use of Radiography in Acute Ankle Injuries

2. Pain on palpation of the bone at the posterior edge of the fibula or tibia over a height of 6 cm or at the tip of one of the 2 malleoli.

Ottawa Ankle Rules (OAR)…

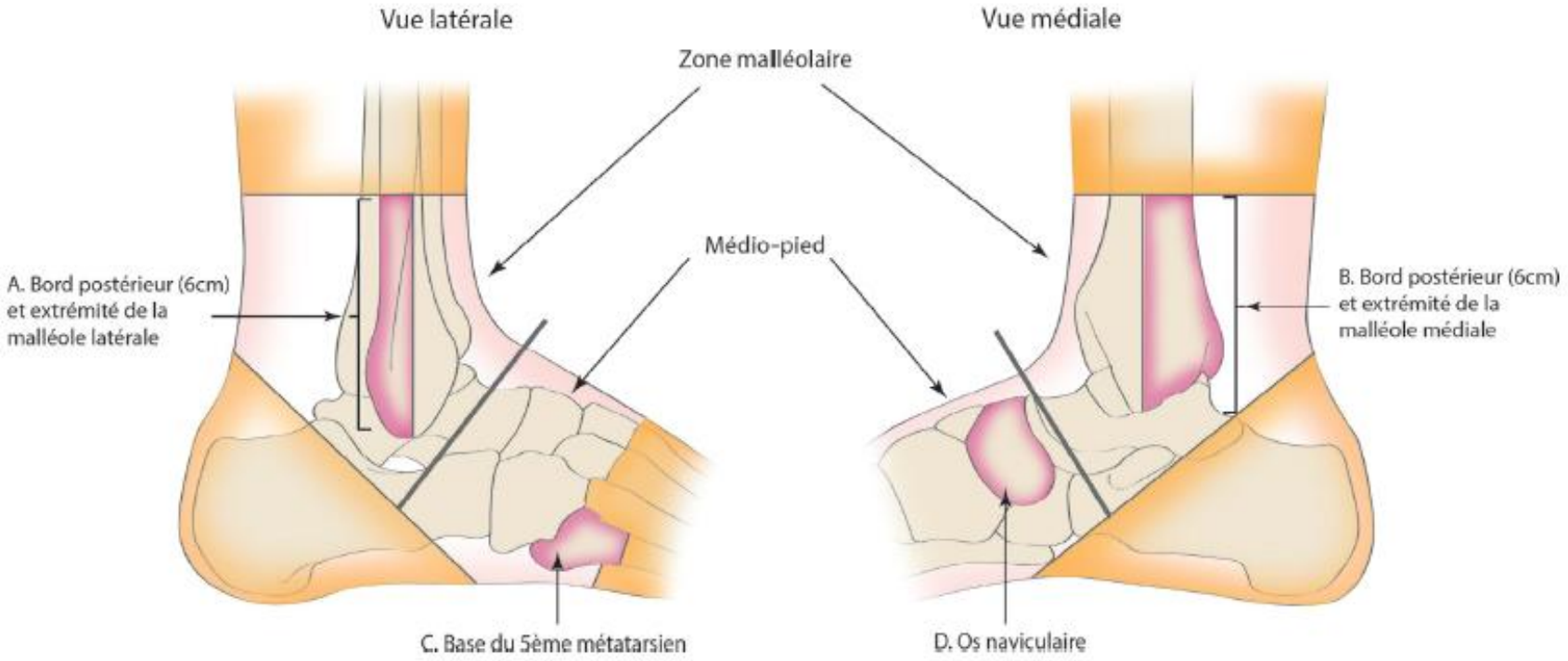
Ian G Stiell, MD, FRCPC*
Gary H Greenberg, MD, FRCPC†
R Douglas McKnight, MD, FRCPC*
Rama C Nair, MStat, PhD‡
I McDowell, PhD‡
James R Worthington, MD, FRCPC*

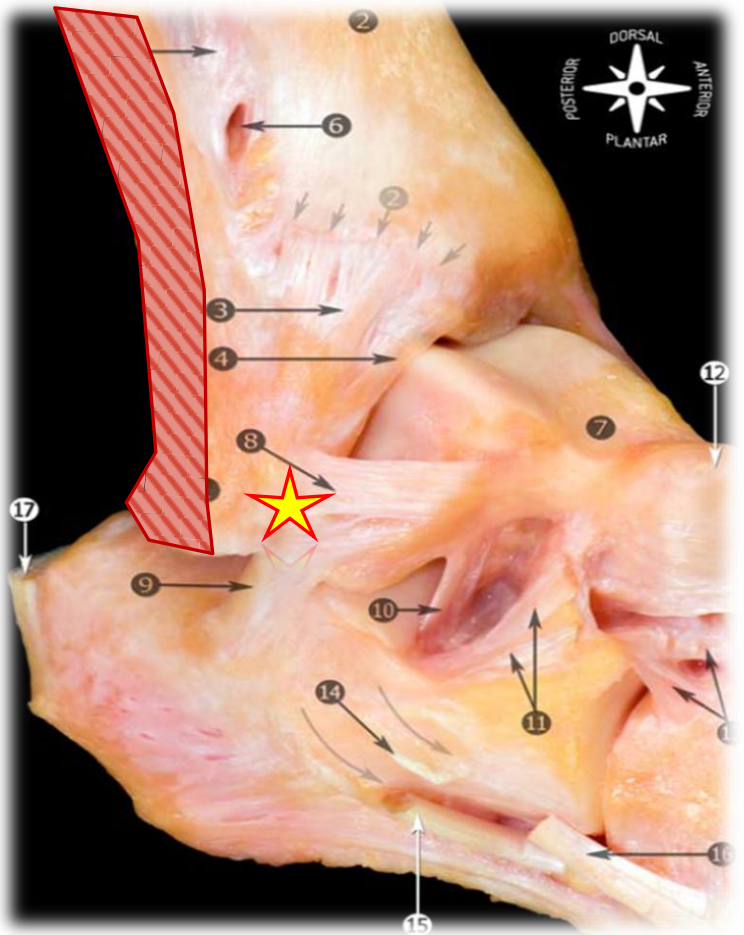
A Study to Develop Clinical Decision Rules for the Use of Radiography in Acute Ankle Injuries

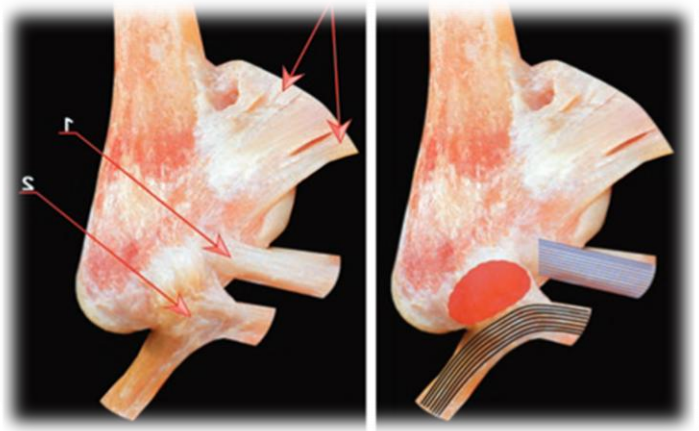
3. Pain on palpation of the navicular or the base of the 5th metatarsal

Stiell et al. *@AEM,JAMA* **1992-1993**

Ottawa Ankle Rules (OAR)…







Tourné et Mabit **2015,** Stiell et al. *@JAMA* **1993**, Golano et al. *@KSTA* **2010**

Bernese Ankle Rules

1. Indirect Fibular Stress Test (10cm)
2. Direct stress test on the medial malleolus
3. Midfoot and hindfoot compression test

*Sensibility of **70%** et specificity of **45-91%** with **RV+3,54** and **RV-0,38***

➔ Less false positive but always after OAR!!

The Journal of TRAUMA® Injury, Infection, and Critical Care

The Bernese Ankle Rules: A Fast, Reliable Test after Low-Energy, Supination-Type Malleolar and Midfoot Trauma

Stefan Eggli, MD, Guido M. Sclabas, MD, Simone Eggli, MD, Heinz Zimmermann, MD, and Aristomenis K. Exadaktylos, MD

Background: Trauma of the midfoot and ankle joint are among the most commonly treated injuries in the emergency unit. The "Ottawa ankle rules" were introduced in 1992 to lower the amount of radiographs based on a standardized clinical examination. The weakness of the "rules" is the low specificity reported in several clinical studies.

Method: We introduced a new indirect stress technique to examine the ankle and the midfoot after low-energy, supination-type trauma, avoiding direct palpation of the injured region.

Results: In 354 prospectively documented patients, the Bernese ankle test produced a sensitivity of 100% and a specificity of 91%.

Conclusion: Compared with the original Ottawa ankle rules, the number of false-positive findings could be significantly reduced, resulting in a reduction of 84% in radiographs after low-energy, supination-type trauma ankle and midfoot trauma. Further investigations have to be performed to prove whether these findings are reproducible within other clinical settings, which could result in major cost savings for the health care system.

Key Words: Malleolar trauma, Clinical examination, Ankle rules, Practice guidelines, Ankle injuries.

J Trauma. 2005;59:1268–1271.

Trauma of the foot and ankle is commonly seen in patients in the emergency unit.[1–4] Nearly all of these patients undergo radiography even though the result is expected to be normal.[4–8] The so-called Ottawa ankle rules introduced by Stiell et al. in 1992[1,8] were widely accepted for lowering the amount of unnecessarily obtained radiographs and at the same time saving time, money, and resources.[1,9,10]

The sensitivity for detecting fractures of the ankle and midfoot region while applying the Ottawa ankle rules ranges in the literature from 94.6% to 100%, whereas the specificity remains relatively low at 11.5% to 50%.[1,4,6–8,10–15]

To improve the specificity for clinical examination after malleolar and midfoot trauma, we developed a new indirect malleolar stress test. This examination technique is described and first results of a prospectively evaluated cohort are presented in this study.

PATIENTS AND METHODS

Between October 2001 and October 2003, a total of 364 patients who had sustained a low-energy, supination-type trauma of the foot and ankle region were treated in our emergency unit. This number represented 7.3% of all patients seen during this time period. Exclusion criteria for entering the study were secure fracture signs (e.g., crepitation, dislocation), language barrier, and difficulty in reliably evaluating the site of injury (e.g., intoxication or diminished sensibility because of neurologic diseases). This left a population of 354 consecutive patients evaluated in a prospective manner. There were 204 male patients and 150 female patients. The average age was 32 ± 13.2 years. The most frequently reported mechanism of accident was an acute varus stress of the extended foot. Fifty-two percent of the patients sustained the injury during sports, 21% sustained the injury at work, 13% sustained the injury at home, 8% sustained the injury during traffic accidents, and 6% reported other reasons. All patients were investigated by the same five permanent senior medical residents, who were initially introduced to the examination technique in a 20-minute teaching by the main investigator. The results of the clinical investigation were documented on a code sheet. Afterward, standardized anteroposterior and lateral radiographs of the ankle and an anteroposterior and oblique radiograph of the midfoot were obtained. All data were stored and analyzed using the clinical information database Qualicare (Qualidoc AG, Trimbach, Switzerland).

Submitted for publication September 12, 2004.
Accepted for publication April 21, 2005.

From the Departments of Orthopedic Surgery (S.E.) and Hand Surgery (S.E.), and the Trauma and Emergency Unit (G.M.S., H.Z., A.K.E.), University of Berne, Inselspital, Berne, Switzerland.
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DOI: 10.1097/01.ta.0000196436.95569.a3

Clinical Examination

The clinical examination was based on three consecutive steps: indirect fibular stress, direct medial malleolar stress, and compression stress of the mid- and hindfoot.

Indirect Fibular Stress

The malleolar fork is compressed approximately 10 cm proximally to the fibular tip, avoiding direct palpation of the injured region (Fig. 1). The compression is executed using the flat of the hand to spread the applied force on a larger area.

Eggli et al. *@JTrauma* **2005**, Kose et al. *@TJEM* **2010**, Beceren et al. *@EJTS* **2013,** Derksen et al. *@Injuy* **2015b,** Bareld et al. *@JEM* **2017**

Bernese Ankle Rules

RV+	Interprétation	RV–
>10	Bonne	< 0,1
5,0–10,0	Modérée	0,1–0,2
2,0–5,0	Faible	0,2–0,5
1,0–2,0	Rarement important	0,5–1,0

*Sensibility of **70%** et specificity of **45-91%** with **RV+3,54** and **RV-0,38***

Bernese Ankle Rules

Injury, Int. J. Care Injured 46 (2015) 1645–1649

Contents lists available at ScienceDirect

Injury

journal homepage: www.elsevier.com/locate/injury

Diagnostic performance of the Bernese versus Ottawa ankle rules: Results of a randomised controlled trial

Robert J. Derksen [a,*], Lisa M. Knijnenberg [b], Gerwin Fransen [c], Roelf S. Breederveld [a], Martijn W. Heymans [d], Inger B. Schipper [e]

*The sensitivity of the OAR […] was **97% compared to 69%** for the BAR (p= 0.008).*
*The specificity of the OAR […] **(29%)** was significantly lower than the **BAR (45%)** (p<0.001)*

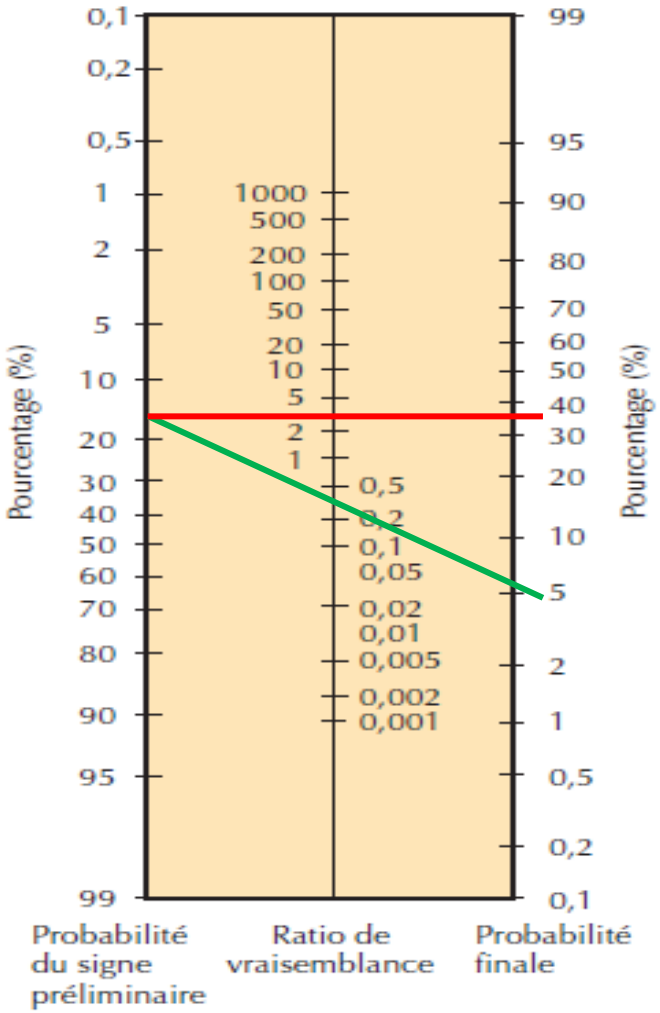
Table 3. Diagnostic Accuracy Values and Meta-analysis

Test	Study (First Author, Year)	TP	FN	FP	TN	Sensitivity (95% CI)	Specificity (95% CI)	LR+ (95% CI)	LR− (95% CI)
Bernese Ankle Rules	Eggli, 2005 (5)	28	0	30	296	0.98 (0.85–1.00)	0.91 (0.87–0.93)	10.5 (7.49–14.8)	0.02 (0.00–0.30)
	Kosc, 2010 (24)	18	1	4	77	0.93 (0.73–0.98)	0.95 (0.87–0.97)	16.9 (6.81–41.7)	0.08 (0.02–0.37)
	Beceren, 2013 (25)	175	139	136	512	0.56 (0.50–0.61)	0.79 (0.76–0.82)	2.65 (2.21–3.17)	0.56 (0.49–0.64)
	Derksen, 2015 (26) EDr	20	9	96	78	0.68 (0.50–0.82)	0.45 (0.38–0.52)	1.24 (0.94–1.64)	0.71 (0.41–1.22)
	Derksen, 2015 (26) n	25	4	104	70	0.85 (0.68–0.94)	0.40 (0.33–0.48)	1.42 (1.17–1.73)	0.37 (0.16–0.89)
	All studies							3.54 (1.73–7.26)	0.38 (0.21–0.70)

Derksen et al. *@Injury* **2015**, Barelds et al. *@JEM* **2017**

RV+ 3,54 et **RV- 0,38**

If OAR were positive, the "initial" probability of fracture rose to 18%.



If they are positive, 43.7% of patients will actually have a fracture

If they are negative, this probability rises to 7%.

Other tools…

✓ Tuning fork: (128 Hz)

Best results (sensitivity 100% and specificity 95% with RV+22 and RV- 0.00) if applied to the distal third of the fibula (!!! If OAR positive!!!)

Figure 1 Application of the tuning fork on the tip of the lateral malleolus.

Figure 2 Application of the tuning fork on the distal fibula shaft 5–10 cm proximal to the point of maximum tenderness.

Jonckheer et al. *@EJGP* **2016**, Dissman et Han. *@EMJ* **2006**

Decision-making tree in the search for foot and ankle fractures

Ottawa Rules(OAR) ankle/foot
RV+ 1.23 and RV- 0.10
More reliable in the first 48 hours

\- → No X-ray necessary
(i.e. a fracture can be ruled out)

\+ → *Proposition d'association d'autres critères…*

Bernese (BAR)
RV+3,54 *and* ***RV-0,38***

Diabetic patients with peripheral neuropathy should have an X-ray even if the Ottawa criteria are all negative

\- → **Vibration distal third of the fibula 128Hz**
RV+22 and RV- 0.00
(if lateral malleolar zone positive on AOR)

\- → *Suspect no fracture*

\+ → X-rays
(front ankle in 15° internal rotation, strict profile, rolling of forefoot)

\+ → X-rays
(front ankle in 15° internal rotation, strict profile, rolling of forefoot)

Also … Achilles rupture

➢ **Thompson Test**

(Calf-Squeeze Test)

- ✓ *sens 96% and Spé 93%*
- ✓ *RV+ 13,71 and RV- 0,04*

TIP!

➢ **Matles Test**

- ✓ *sens 88% and Spé 85%*
- ✓ *RV+ 6,29 and RV- 0,14*

TABLE 2
Sensitivity and Positive Predictive Value of the Tests in the 133 Patients Who Underwent Open Repair of the Achilles Tendon Tear

Test and patient state	Sensitivity	Positive predictive value
Gap (N = 133)		
Awake	0.73	0.82
Anesthesia	0.81	0.85
Calf squeeze (N = 133)		
Awake	0.96	0.98
Anesthesia	0.96	0.96
Matles (N = 77)		
Awake	0.88	0.92
Anesthesia	0.94	0.97
Copeland (N = 44)		
Awake	0.78	0.92
Anesthesia	0.81	0.88
O'Brien (N = 17)		
Awake	NA	NA
Anesthesia	0.80	0.85

Maffuli et al**. 1998**, Reiman *@JAT* **2014**

Related injuries

ELSEVIER

Clinics in Sports Medicine
Volume 39, Issue 4, October 2020, Pages 845-858

Peroneal Tendinosis and Subluxation

Julian G. Lugo-Pico MD [a], Joshua T. Kaiser BS [b], Rafael A. Sanchez MD [a], Amiethab A. Aiyer MD [c]

Damage to the superior retinaculum and fibular dislocation

- The patient may spontaneously describe a “clunk".
- Resisted eversion test (isometric) or rotational movements of the ankle.

Summary “On field”

✓ Search and rule out fracture

↓

✓ Nerve or blood vessel injury

↓

✓ Severe tendon injury

↓

✓ Determine which ligament structures are likely to be affected

Redirect/refer if necessary or if in doubt...

Initial treatment: care in the field

Editorial

PRICE needs updating, should we call the POLICE?

C M Bleakley,[1,3] P Glasgow,[2,3] D C MacAuley[4]

→Protocole **P.OL.I.C.E**

*" Optimal loading means **replacing rest** with a balanced and **incremental rehabilitation programme** where **early activity** encourages early recovery. »*

Bleakley et al. *@BSJM* **2011**

Pain management

- ✓ Discharge
- ✓ Physiotherapy
- ✓ Massage
- ✓ Cryotherapy, pressotherapy
- ✓ Specific joint decoaptation and mobilisation

Key to rehabilitation (regaining support, mobility, muscle strengthening, return to sport, etc.)

Oedema management

- ✓ Compression
- ✓ Lymph massage
- ✓ Walking
- ✓ Ice
- ✓ Declive
- ✓ Decoaptation and Manual Therapy

It will determine the progress of rehabilitation (loading + recovery)

Delayed assessment « Off field »

"The **sensitivity (96%)** and **specificity (84%)** of physical examination using the anterior drawer test are optimised if clinical assessment is delayed for between **4 and 5 days postinjury.**"

Vuurberg et al. *@BJSM* **2018,** Delahunt et al. *@BJSM* **2018,** Kovaleski et al. *@JAT* **2008,** Van Dijk et al. **1996,** Gaebler et al.**1997**

Elements prior to treatment

Mechanism of injury

Be aware of mechanisms characteristic of:
Lateral ankle sprain
Syndesmosis sprain

Why?
Guide assessment of appropriate tissues

Establish history of previous lateral ankle sprain

Why?
Primary risk factor for recurrent injury
May indicate that there are unresolved mechanical and/or sensorimotor impairments

Assessment of ligaments

ATFL (Anterior drawer test, palpation & manual stress testing)
CFL (Palpation & manual stress testing)
Syndesmosis (Palpation, squeeze test)

Assessment of bones & weight-bearing status

Why?
Establish the likelihood of ankle fracture (via use of Ottawa Ankle Rules)

Palpation

Journal of Athletic Training 2019;54(6):617–627
doi: 10.4085/1062-6050-484-17

www.natajournals.org

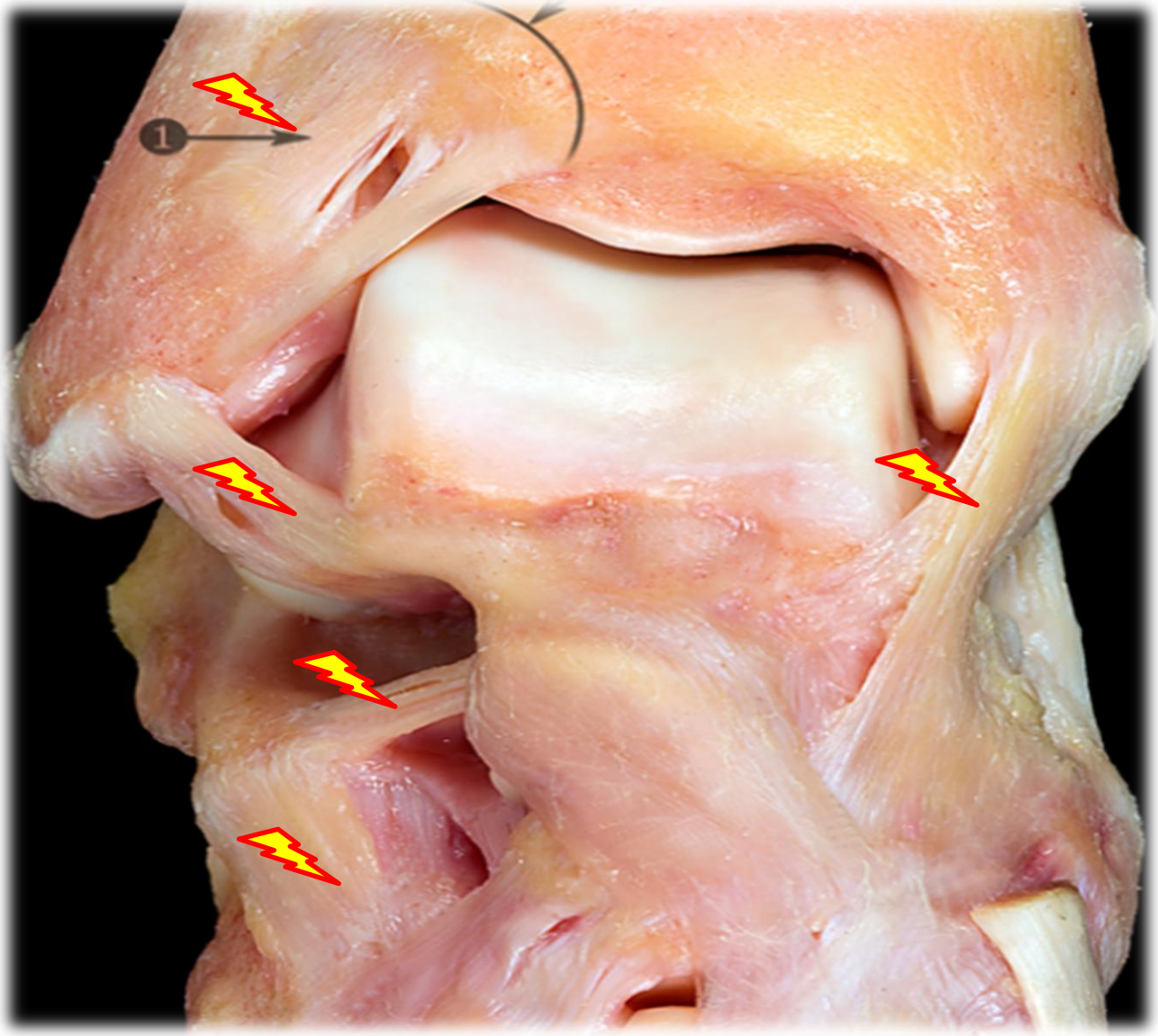
Current Concepts

Evaluating and Differentiating Ankle Instability

Phillip A. Gribble, PhD, ATC, FNATA

Department of Athletic Training and Clinical Nutrition, College of Health Sciences, University of Kentucky, Lexington

Given the prevalence of lateral ankle sprains during physical activity and the high rate of reinjury and chronic ankle instability, clinicians should be cognizant of the need to expand the evaluation of ankle instability beyond the acute time point. Physical assessments of the injured ankle should be similar, regardless of whether this is the initial lateral ankle sprain or the patient has experienced multiple sprains. To this point, a thorough injury history of the affected ankle provides important information during the clinical examination. The physical examination should assess the talocrural and subtalar joints, and clinicians should be aware of efficacious diagnostic tools that provide information about the status of injured structures. As patients progress into the subacute and return-to-activity phases after injury, comprehensive assessments of lateral ankle-complex instability will identify any disease and patient-oriented outcome deficits that resemble chronic ankle instability, which should be addressed with appropriate interventions to minimize the risk of developing long-term, recurrent ankle instability.



" Importantly, following an ankle inversion injury, **60% of patients** will have pain over the **medial malleolus** in the **absence** of a **syndesmosis injury** or **medial malleolus fracture**"

Van Dijk et al. **1996a,** Gribble P. *@JAT* **2019**

Clinical tests

- ✓ **<u>Anterior drawer (ATFL)</u>**
  - ✓ *(sens 0,73-96 and spec 0,84-0,97)*
  - ✓ *RV+ infinite and RV-0,42*

Several positions described (patient lying or sitting on edge of table)

The laxity appears to be greater than 90° of knee flexion and 10° of ankle plantar flexion.

➔ *We can try to palpate the tension in the LTFA*
➔ *Presence of a "sulcus"*

Vuurberg et al. *@BJSM* **2018,** Delahunt et al. *@BJSM* **2018,** Kovaleski et al. *@JAT* **2008,** Van Dijk et al. **1996,** Gaebler et al.**1997**

Clinical tests

- ✓ **Le talar tilt test (CFL)**
  - ✓ *(sens 0,5 and spé0,88)*
  - ✓ *RV+4 and RV-0,57*

One hand stabilises the leg segment

The aim is to induce a varus movement to the rearfoot

We can try to feel the tension in the LCF

"The range of positive findings has been debated, but in general, ***more than 10° of movement*** *is believed to indicate instability."*

Lynch *@JAT* **2002,** Vuurberg et al. *@BJSM* **2018,** Delahunt et al. *@BJSM* **2018,** Gribble *@JAT* **2019**

Syndesmosis Injury

Société Française des Masseurs Kinésithérapeutes du Sport

Original Research

The Epidemiology of Ankle Injuries Identified at the National Football League Combine, 2009-2015

Mary K. Mulcahey,*† MD, Andrew S. Bernhardson,‡ MD, Colin P. Murphy,‡ BA, Angela Chang,§ BS, Tyler Zajac,‡ ATC, George Sanchez,‡ BS, Anthony Sanchez,‡ BS, James M. Whalen,‖ MSEd, ATC, Mark D. Price,¶ MD, Thomas O. Clanton,‡ MD, and Matthew T. Provencher,‡ MD, CAPT, MC, USNR

Investigation performed at Steadman Philippon Research Institute, Vail, Colorado, USA

ORIGINAL RESEARCH

Epidemiology of Syndesmosis Injuries in Intercollegiate Football

Incidence and Risk Factors From National Collegiate Athletic Association Injury Surveillance System Data from 2004-2005 to 2008-2009

- The ankle is the joint most affected
- Figures underestimated (between 2 and 5.5 times)
- Accounts for up to 30% of ankle injuries in contact sports (hockey, rugby, A. football... and skiing)

« In 1990, ankle syndesmosis injury was reported to ***constitute 1% of all ankle sprains****, whereas in* ***2013 almost 25%*** *of ankle sprains were reported to affect the ankle syndesmosis"*

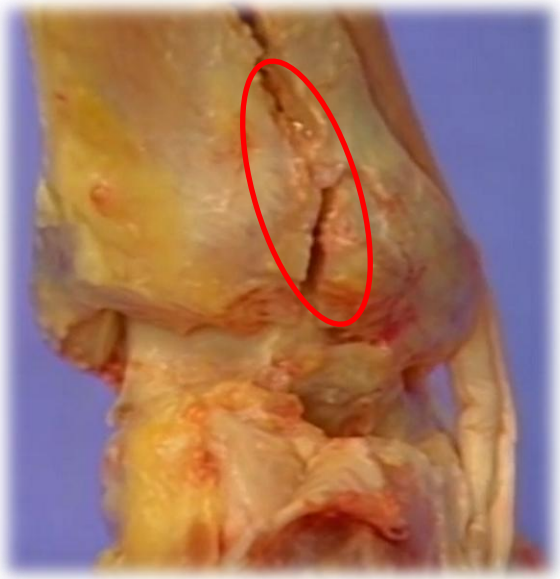
Sman et al. *@MSSE* **2014 ,** Hopkinson et al. *@Foot Ankle* **1990,** Hunt et al. *@CJSM* **2013,** Mulcahey et al. *@OJSM* **2015**

Anamnesis and palpation

✓Anamnesis+++

➔ Injury mechanism (Rot.Ext/Flex D)

(Se 83% and Sp 22%)



➔ **Swelling and pain felt supra-malleolar**

- ➔ **shin**
- ➔ **knee**

➔ Inability to walk (Se 89% and Sp 21%) and jump (Se 89% and Sp 29%)

Dubin et al. **2011,** De Cesar et al.**2011**, Sman et al. *@BJSM* **2013, 2015**, Van Djick et al. **2016**, Williams et al. @AJSM **2007**

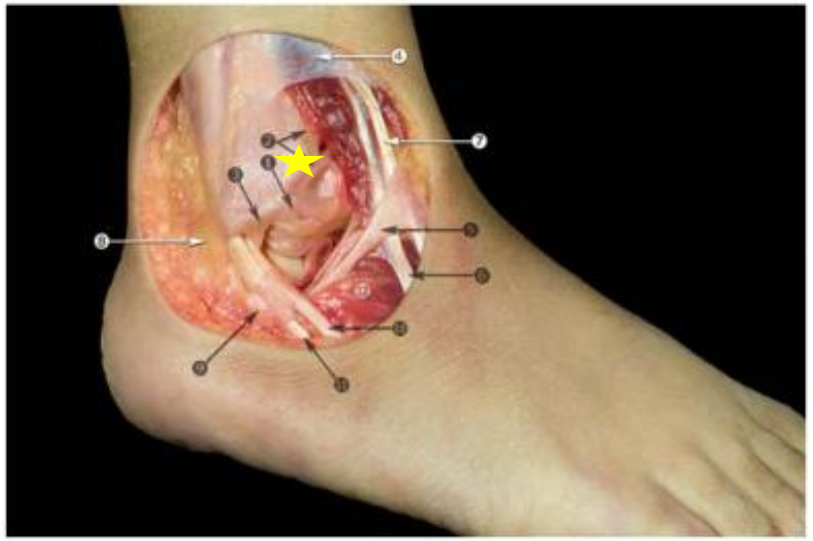
Clinical examination

1. Pain+++ in dorsal flexion ROM

2. Pain on syndesmotic joint line + IO membrane

3. ~~Cross leg test positive~~

Deltoid ligament assessment +++



Original article

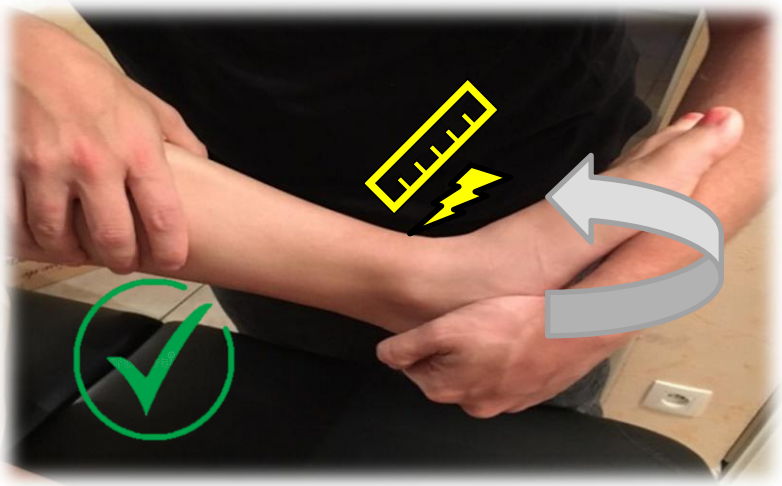
Diagnostic accuracy of clinical tests for ankle syndesmosis injury

Amy D Sman,[1] Claire E Hiller,[1] Katherine Rae,[2] James Linklater,[3] Deborah A Black,[1] Leslie L Nicholson,[1] Joshua Burns,[1] Kathryn M Refshauge[1]

Dubin et al. **2011,** De Cesar et al.**2011**, Sman et al. *@BJSM* **2013, 2015**, Van Djick et al. *@KSSTA* **2016a,b** Williams et al. *@AJSM* **2007**,

Clinical testing

- Squeeze test
  - ✓ *Sens 26% Spé 88%*
  - ✓ *RV+ 2,95 and RV- 0,84*



- Cotton test
  - ✓*sens 29%...*

- External rotation stress test
  - ✓*sens 71% Spé 63%*
  - ✓*RV+ 1,93 RV- 0,46*

- Fibular translation test
  - ✓*sens 64% Spé 57%*
  - ✓*RV+ 1,50 RV- 0,63*

Sman et al. *@BJSM* **2013, 2015**, Van Djick et al. **2016,** Guermarzi et al. **2016**

Ankle injury, non-fractured

Stage 1 (believe the positive cluster)
Syndesmotic palpation/dorsiflexion lunge

+/+ +/- -/+ -/-

SnNOUT

Syndesmotic involvement not likely

Stage 2
Squeeze test

External rotation stress test

\+

\-

SpPIN

False positive finding from the prior cluster

Highest clinical likelihood of syndesmotic injury

- MRI, US and/or arthroscopy to confirm diagnosis

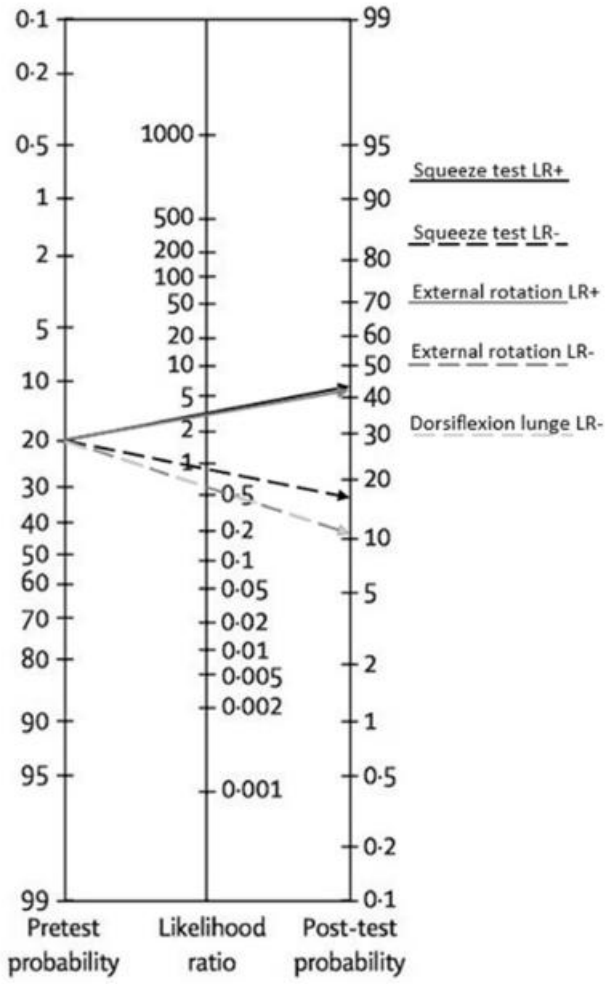
Contents lists available at ScienceDirect

Physical Therapy in Sport

journal homepage: www.elsevier.com/ptsp

Review Article

Diagnostic accuracy of clinical tests assessing ligamentous injury of the ankle syndesmosis: A systematic review with meta-analysis



Rule out the fracture

International Journal of Surgery Case Reports 41 (2017) 360–365

Contents lists available at ScienceDirect

International Journal of Surgery Case Reports

journal homepage: www.casereports.com

The isolated posterior malleolar fracture and syndesmotic instability: A case report and review of the literature

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Highlights

- An isolated fracture of the posterior malleolus can be a sign of a more complex injury.
- A posterior malleolar fracture can be associated with other ligamentous and syndesmotic injuries or other lower leg fractures.
- An isolated posterior malleolar fracture can easily be missed on plain radiographs.
- Diagnostic work-up of an isolated posterior malleolar fracture includes a CT-scan.
- If diagnosed and treated properly, it has a good long-term functional outcome.

X-ray

Smeeing et al. *@IJSCR* **2017,** Taweel et al. *@JEM* **2013**,Inokuchi et al. *@BJM* **2019**Jain et al. *@JEM* **2018**, Schnetzke,et al. *@WJO* **2018**, Magan et al. *@BMB* **2014**

Classification

IOM: Interosseus membrane

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Acute (< 6 wks)	Sub acute (>6 wks)	Chronic (> 6 months)

- **Grade I:** Partial or total tear of **TFAIL only**.
- **Grade IIa:** Injury of TFAIL **+ IOM** But NO deltoid ligament injury

STABLE

Traitement conservateur

- **Grade IIb:** Injury of TFAIL **+ IOM** But WITH deltoid ligament injury
- **Grade III:** Clear instability involving all ligaments + posterior compartment, deltoid ligament and potentially the presence of a fracture

INSTABLE

Traitement chirurgical

van Dijk et al. *@KSSTA* **2016a, 2016b**

Conservative treatment

- Immobilization with a flat boot or splint for 6 weeks (no consensus).
- Progressive re-weighting (proprioception, neuromuscular control, etc.)
- **BE CAREFUL with dorsal flexion of the ankle**
- Return to sport:12 weeks for a grade II before resuming weight-bearing changes.
- Ability to do a series of hops without pain for 30s

Prevention ????

Note that recovery times are longer than for a classic sprain (3 to 5 times longer).

Williams et al. *@AJSM* **2007** D'hooghe et al. *@OTO* **2018**

CONCLUSION

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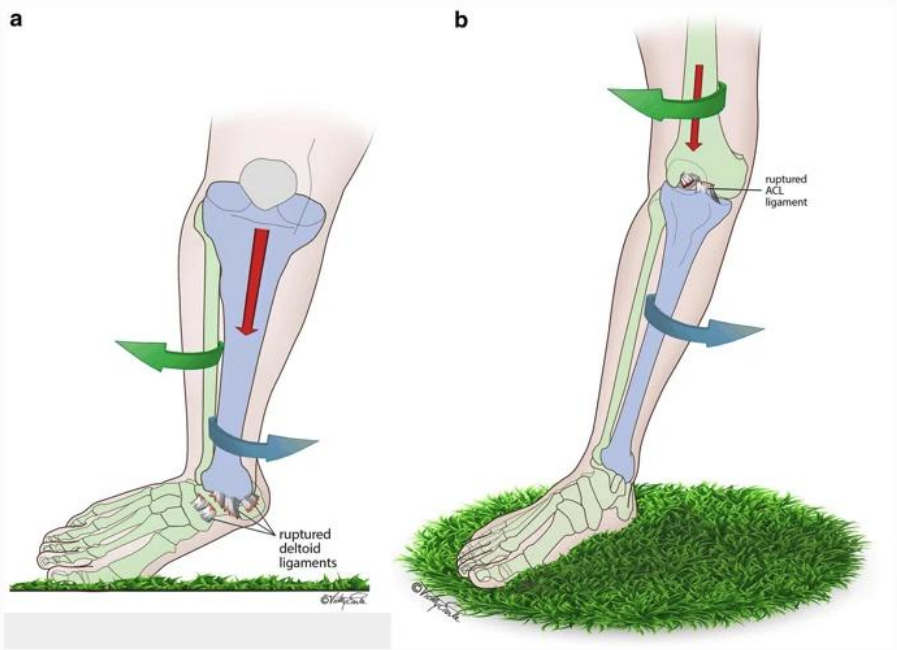
- Do not underestimate syndesmosis (up to 30% in sports populations)
- Interrogatory +++ (pain, mechanism of injury)
- Beware of complications (fractures)
- Clinical tests are not very accurate...(imaging ofte
- Grades I and IIa Conservative treatment
- Grade IIb and III Surgical opinion
- Recovery time +++ (minimum 6-week course)

Fig. 1



a Mechanism of ankle syndesmosis injury. With the forefoot fixed in the grass and valgus/pronation of the hindfoot, the deltoid ligament ruptures. External rotation of the (for/mid) foot/talus/fibula complex causes rupture of the AITFL–IOL–(PITFL) (green + green arrow). Internal rotation of body and tibia (blue + blue arrow). Axial body load (red arrow). **b** Mechanism of ACL injury. Whole foot fixed in the grass. Valgus moment. External rotation of the femur and internal rotation of the tibia causing the postero-lateral bone bruise on the tibia (subluxation) (green and blue arrow). Axial load of body weight (red arrow)

Summary “Off field”

✓ Specify ligament or associated injuries

↓

✓ Refer if necessary

↓

✓ Carry a full assessment (ROAST)

Refer if necesary or if any doubts