

Anatomy, diagnosis and management of ankle syndesmosis injuries: Part Three

This is part three of my series on ankle syndesmosis injuries. If you haven't seen the previous two articles check them out in the archived resources section at www.rehabroom.co.uk.

This article will focus on the use of imaging and objective testing to diagnose a ankle syndesmotic injury.

Imaging

The initial presentation of your athlete or patient will initially guide you as to your initial intervention. Any marked bony tenderness at the base of the fibula, inability to weight bear and large joint effusion may indicate a bony injury. In this instance an x-ray would be advisable to rule out or rule in a fracture. You should not use any of the objective tests shown below until a fracture has been ruled out.

The x-ray should be completed in a unilateral standing position so the x-ray can observe the joint in a weight bearing position and thus, show maximal joint loading. Reference should be made to the uninjured side to account for any individual structural differences.

The x-ray would usually involve three views. These views are an anterior to posterior, mortise and a lateral view. The mortise view is taken with the tibia internally rotated 15 to 20 degrees to allow for better visual appreciation of the medial clear space. The anterior to posterior and lateral views should extend the entire length of the tibia and fibula to rule out a Maisonneuve fracture of the proximal fibula.

Radiographers will be looking at the following: tibiofibular clear space, medial clear space, and tibiofibular overlap. The tibiofibular clear space is considered the most reliable of these indicators as it is not significantly influenced by tibial rotation (Press, Gupta, & Hutchinson, 2009).

As mentioned, a unilateral weight bearing x-ray is advantageous. This however, may not always be possible as the athlete may be unable to put any force through their lower limb. Thus, if you are happy with their peripheral blood supply and happy there is no neural component the x-ray may wait 24-48 hours. Or a non-weight bearing x-rays may be used.

Further imaging might be warranted to look at any soft tissue injury that would not be picked up during an x-ray. A magnetic resonance imaging (MRI) scan would look for any ligamentous, tendon or muscle damage.

I routinely do not use MRI scanning as I feel it doesn't change how I would manage a syndesmotic injury. If I was confident with my objective testing and was planning to manage the injury conservatively I wouldn't use an MRI. However, if a period of conservative management was not improving symptoms I may consider an MRI. In addition, if surgical intervention was going to be considered most consultants would routinely use an MRI to consider whether surgery would be the best option. In that case getting a scan prior to the consultant appointment would be advantageous.

Imaging may also be used to review injury healing and can be useful if stagnation in healing and symptom improvement occurs. This can help evaluate for the presence of any ossification or development of a synostosis within the interosseous membrane. There is no consensus in the literature as to how long it takes for heterotopic ossification to occur; only that is a complication noted in chronic conditions.

Objective testing

As mentioned above, testing should only occur when a fracture has been ruled out. I would always start with the squeeze test as the pressure you apply can be gradually increased which is particularly useful with an acute injury.

Squeeze test

The test can be performed in crook lying, prone or with feet over the sides of an examination table. I usually use the test in a crook lying position as I feel this increases the level of accuracy as you can put the ankle in a position of greater dorsiflexion, thus, stress the integrity of the distal tibio-fibula joint to a greater extent.

The test aims to examine the integrity of the distal tibia and fibula by using a force directed at the proximal third of the tibia and fibula. During the test, reproduction of the patient's symptoms is a positive result. This test is more sensitive for a disruption of the AITFL.

The level of force applied can be increased during the testing procedure. This will be relevant to the presentation of the patient on the table. If minimal force reproduces their symptoms then that's a positive result and further squeeze testing is not required. However, if initial testing is negative the amount of force or 'squeeze' applied at the proximal tibia and fibula joint can be increased. To produce a negative result maximal squeeze must be asymptomatic.



Squeeze test: Compression of the proximal third of the leg to cause a distal separation of the tibia and fibula (Mulligan, 2011).

Dorsiflexion with lateral rotation test

This test, also known as the Kleiger test, is performed by stabilizing the leg and then externally rotating the foot. The foot must be in a position of maximal dorsiflexion prior to applying rotation. Thus, this test cannot always be used in the acute setting.

As mentioned earlier in the series the distal tibio-fibula joint is under its greatest tension during the movements of dorsiflexion and lateral rotation, as the broader portion of the talus externally rotates within the mortise.



Dorsiflexion-external rotation test: The lower leg is stabilized while the examiner externally rotates the foot with the ankle in maximal dorsiflexion. The external rotation force should be sufficient to mildly gap the distal syndesmosis (Mulligan, 2011).

This test, like the squeeze is more sensitive to AITFL injury although if medial ankle pain is reproduced injury to the deltoid ligament may be present and would warrant further testing.

Alonso et al (1998) found this test to have the highest degree of inter-tester agreement, the lowest rate of false positives and found a correlation between a positive test and a protracted recovery from injury. This was if there was also palpatory tenderness and a positive squeeze test.

Lateral rotation test

The lateral rotation test again uses the movements of dorsiflexion and lateral rotation to test the integrity of the distal tibia and fibula. I aim to get the foot in a neutral position with the patient sitting over the side of the examination table.

Next stabilise the upper tibia and fibula whilst with the other hand rotates the foot into end range external rotation. Reproduction of the patient's symptoms is considered a positive test.



Lateral rotation test: With patient sitting over the side of the examination table the proximal lower leg is stabilised and the foot externally rotated. The foot must be at neutral position of dorsiflexion during testing. Picture from Physio-pedia.com.

Conclusion

I hope this has given a few ideas as to how imaging and objective testing can be used to diagnose an ankle syndesmotic injury.

I had originally planned to add conservative management strategies within this post; however, I will post them as a separate article in the near future.

Thanks for reading

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References

Alonso, A., Khoury, L., & Adams, R. (1998). Clinical tests for ankle syndesmosis injury: reliability and prediction of return to function. *Journal of Orthopaedic and Sports Physical Therapy*, 27, pp. 276-284.

Mulligan, E. P. (2011) Evaluation and management of ankle syndesmosis injuries. *Physical Therapy in Sport*, 12, pp. 57-69.

Press, C. M., Gupta, A., & Hutchinson, M. R. (2009). Management of ankle syndesmosis injuries in the athlete. *Current Sports Medicine Reports.*, 8, pp. 228-233.