

Ankle Injury

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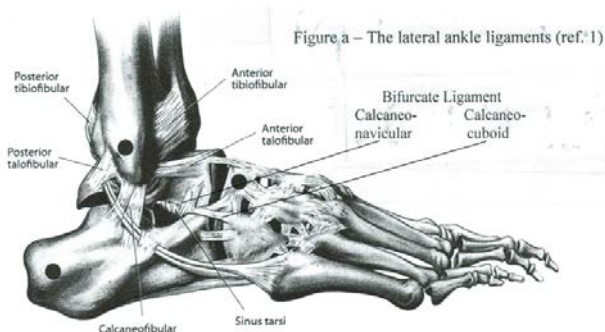


Bifurcate Ligament Sprain

The most common of all joint injuries, the lateral ankle sprain, generally involves tearing of the anterior talofibular ligament (ATFL). With greater degrees of sprain, the joint, bone or other soft tissues structures may be involved. There will be an egg shaped swelling over the lateral malleolus, or generalised swelling around the ankle. Occasionally however, a patient presents with pain and swelling which is slightly more distal, localised over the lateral midfoot, in the region of the cuboid. This is not common, however it is worth reviewing the possible structures involved, and being aware of bony injuries which may be associated.

Lateral midtarsal joint sprains generally involve the calcaneocuboid joint and the bifurcate ligament [see figure a]. These injuries are most commonly seen in gymnasts, jumpers & footballers (2, 3). As with a lateral ankle sprain, the mechanism is often inversion & plantar flexion, which creates tension through the ATFL & calcaneocuboid ligament (5). There is pain, localised tenderness & swelling on the dorsolateral aspect of the calcaneocuboid joint. On movement testing, foot inversion or supination with plantar flexion is restricted & painful.

The bifurcate ligament runs anteriorly from the superior surface of the calcaneus into two slips, the calcaneocuboid, & the calcaneonavicular ligaments (3) [fig. a]. Either ligament may be injured. There may also be an associated fracture to the anterior process of the calcaneus (3,5). These account for only 3% of all calcaneal fractures, however their infrequency means they are often missed clinically, leading to non-union & persistent ankle pain (5). The fracture is more common in patients who have a calcaneonavicular coalition (5), however it may occur without this anomaly. It can be assessed with plain XRay, particularly lateral varus stress views (3), however CT may give clearer imaging. MRI will give information about both the bone & the ligament injury, and is the imaging of choice (2). Petrover's et al study looked at MRI findings in patients who had an anterior process of calcaneus fracture. Bony oedema, described as trabecular microfracture was present in all subjects, while actual vertical fracture was present in only 1/3 of cases (5) [see fig. b]. Thus plain XRay may have missed around 2/3 of these injuries. The incidence of this fracture was found to be between 0.5% & 1% of all ankle MRI's reviewed. Approximately 75% of these patients were female (5), which may relate to the wearing of high-heel shoes. Half of their study participants who had this fracture also had a tarsal coalition, half reported prior ankle sprains, & 2/3



had evidence of bifurcate ligament injury. An undisplaced or mildly displaced fracture is treated with 4 weeks immobilisation. A displaced fracture may require surgery (2).

Both bifurcate ligament injuries, and sprains affecting the ATFL can be complicated by synovitis in the sinus tarsi. 'Sinus tarsi syndrome' is commonly diagnosed after inversion injury, however there is still debate as to its pathology (3). It may involve strain of the interosseous talocalcaneal ligament, & is sometimes associated with hindfoot instability (3). To palpate the sinus tarsi, move anteriorly from the lateral malleolus over the extensor digitorum brevis muscle belly. Palpate deeply through the muscle till you feel a depression – the sinus tarsi (4). [See fig. a]. It is difficult to differentiate clinically between tenderness of the ATFL, the calcaneonavicular ligament, and the sinus tarsi.

Anderson et al describe a less common complaint in this region – calcaneocuboid subluxation. This can occur following repetitive inversion sprains, and has been reported mostly in dancers (1). The subluxation may not be evident on XRay imaging as it is usually self-reducing, however a lateral stress view may show widening of the joint.

Treatment of the uncomplicated bifurcate ligament sprain involves RICE, followed by mobilisation, strengthening, proprioceptive retraining, & strapping for return to sport. If inflammation persists NSAID's or corticosteroid injection into the joint or sinus tarsi may prove beneficial.

References:

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3. Franklyn-Miller, A. Et al (2011). Clinical Sports Anatomy, 1st ed. McGraw Hill, Ryde. pp310-312, 338-341.
4. Magee, D. (2008). Orthopedic Physical Assessment, 5th ed. Saunders Elsevier, Missouri. P 913.

5. Petrover, D. Et al (2007). Anterior process calcaneal fractures: a systematic evaluation of associated conditions. Skeletal Radiology, 36, 627-632. (Diag. B is taken from Petrover et al).

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