



Frontal radiograph left foot

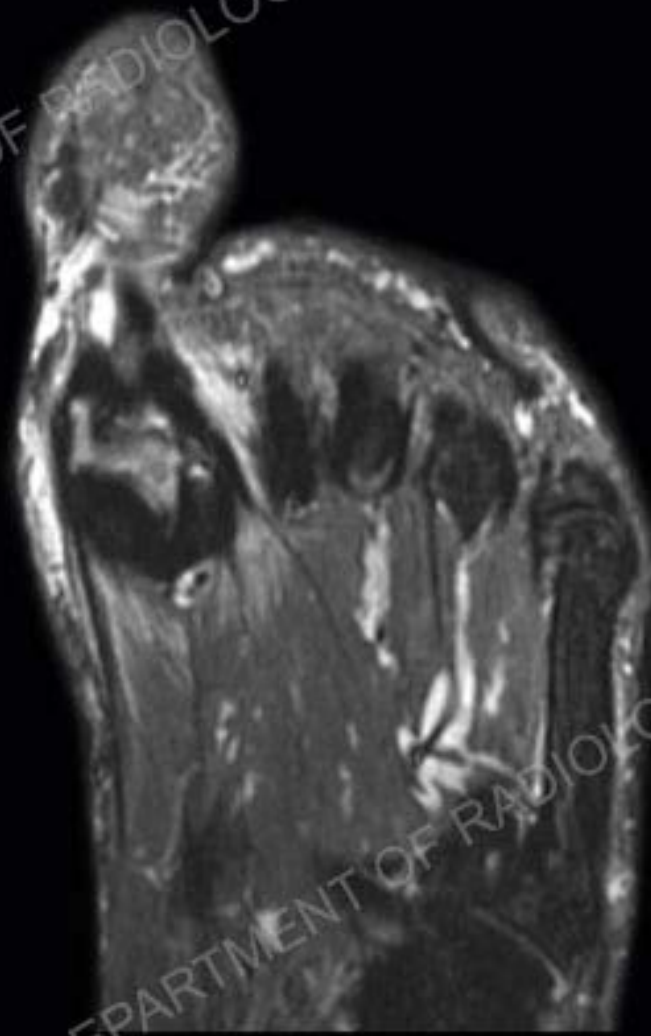


Frontal radiograph right foot

History: 28 year old professional football player with recent right foot injury.



Oblique radiograph right 1st MTP



Coronal IR images of the right forefoot



Sagittal PD medial aspect 1st MTP



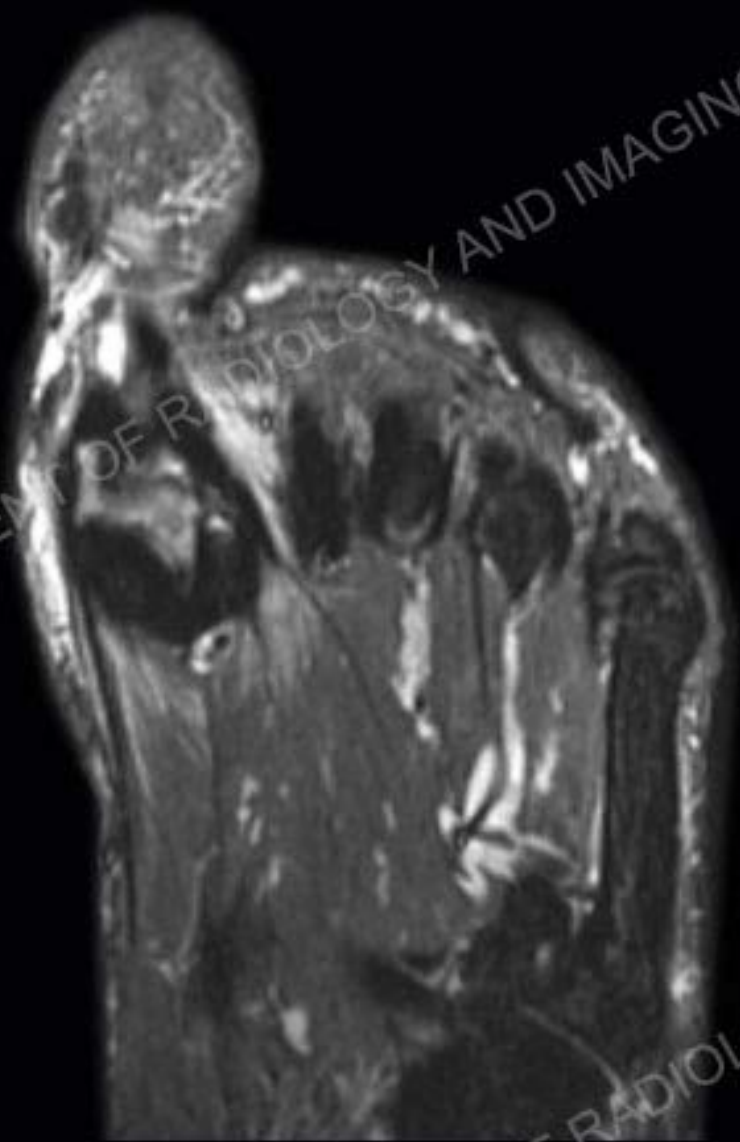
Sagittal PD lateral aspect 1st MTP

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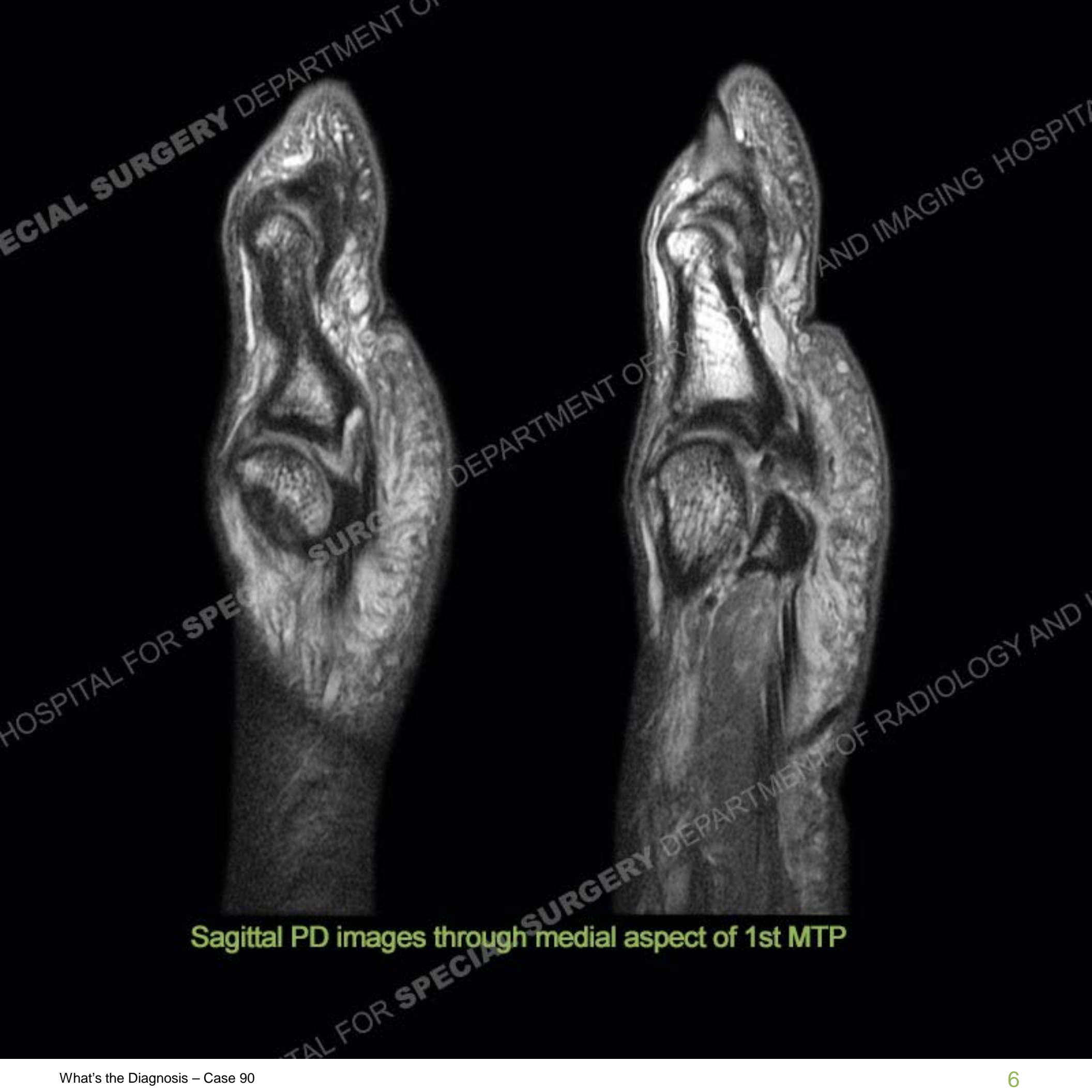


Coronal IR



Coronal PD

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Sagittal PD images through medial aspect of 1st MTP



Axial PD image proximal to 1st MTP



Axial PD image at 1st MTP



Coronal IR



Coronal PD

Findings

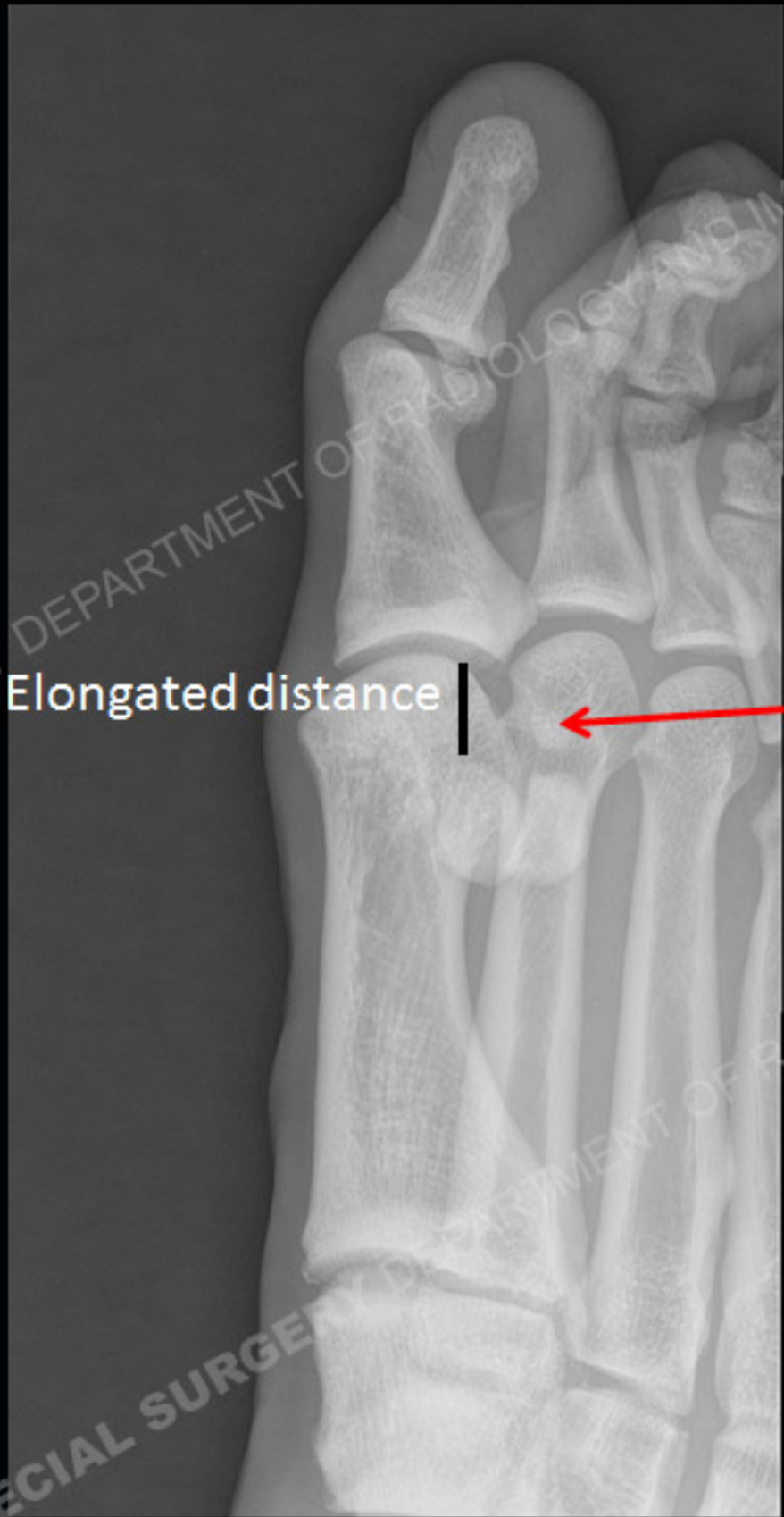
The radiographs demonstrate asymmetric positioning of the hallucal sesamoids when comparing the right to the left side. There is a proximal retraction of the sesamoids on the right side and an additional fracture through the right sided lateral hallucal sesamoid. MRI demonstrates marked edema centered about the right 1st MTP. As on the radiographs, again seen is the fracture of the lateral hallucal sesamoid but in addition there is a disruption of the medial sesamoid phalangeal ligament, partial disruption of the intersesamoid ligament, chondral shearing of the 1st MTP, and strain of the abductor hallucis muscle. Not shown in entirety are intact flexor hallucis longus and brevis tendons.





Normal distance

Elongated distance



Elongated distance

Fracture



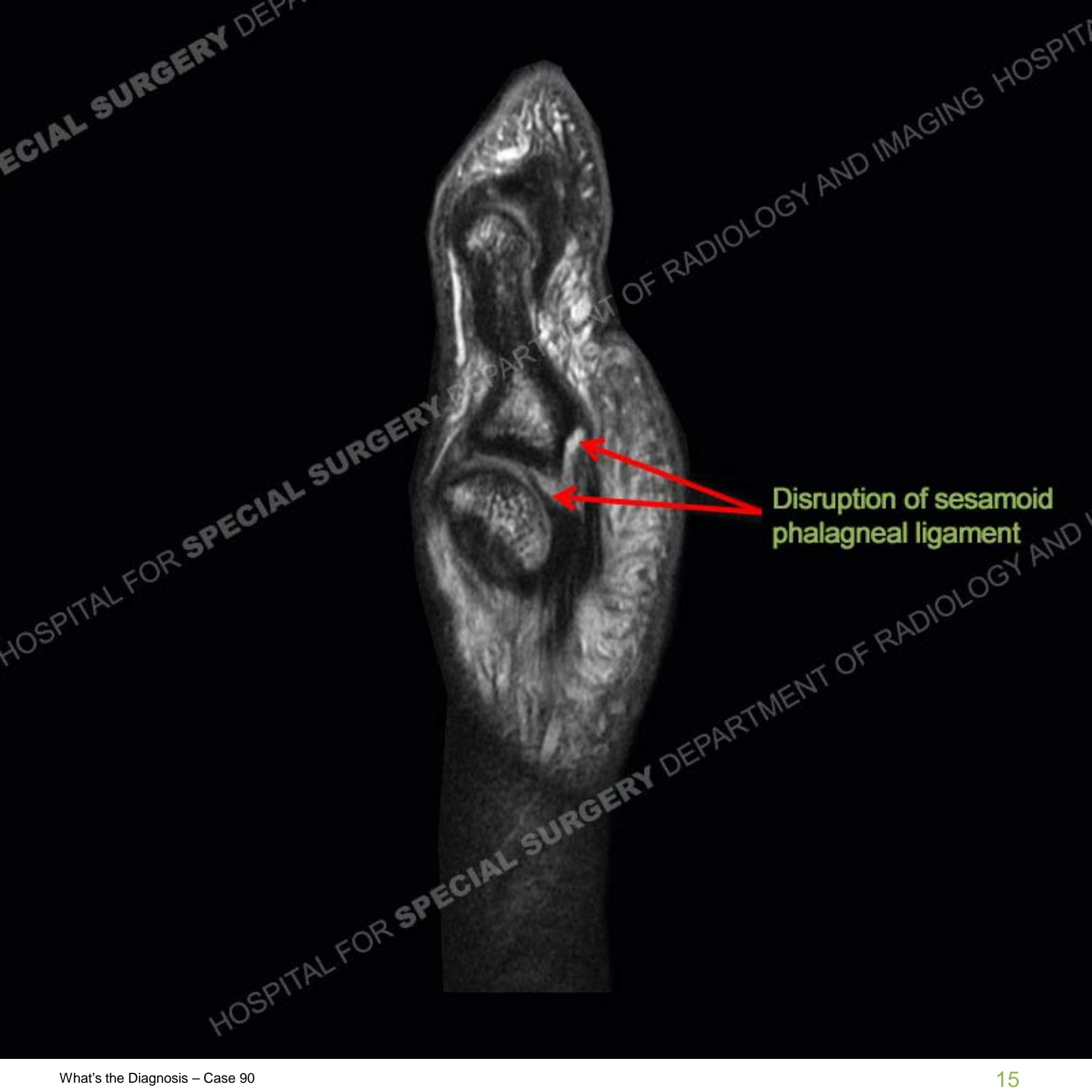
Disrupted sesamoid phalangeal ligament



Lateral hallucal
sesamoid fracture

Disruption of sesamoid phalangeal ligament





Disruption of sesamoid phalangeal ligament



Cartilage shearing with fragment

Muscle strain abductor hallucis

Disruption of intersesamoid ligament



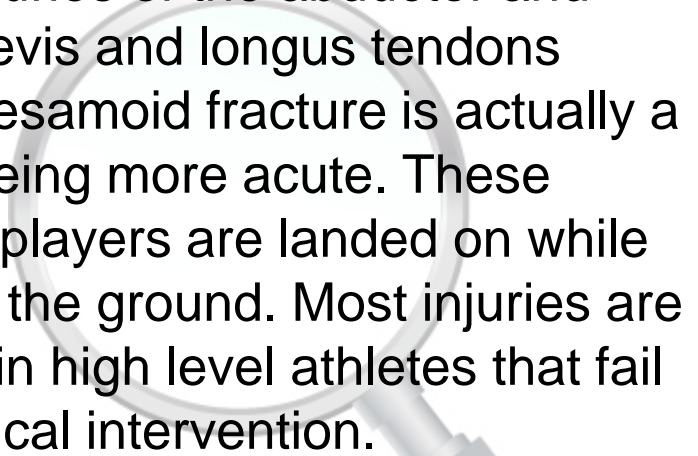
Intact collateral ligaments



Diagnosis: Turf Toe

Turf toe represents a constellation of pathology involving the plantar capsuloligamentous complex of the first MTP. The injury is sustained when the forefoot is fixed to the ground with the first MTP extended and then an axial load is applied to the heel. This results in hyperextension at the first MTP with disruption of the plantar capsuloligamentous complex. As compared to the remainder of the lesser MTP's, stability at the first MTP is imparted not as much by the plantar plate but by multiple ligaments including the metatarsal sesamoid, sesamoid phalangeal, intersesamoid, and collateral ligaments.

Within this constellation of injuries is additionally included sesamoid fractures, cartilage shearing injuries, and muscle/tendon injuries of the abductor and adductor hallucis as well as the flexor hallucis brevis and longus tendons about the first MTP. In this example, the lateral sesamoid fracture is actually a more remote injury with the medial sided injury being more acute. These injuries are often seen in football or rugby where players are landed on while already on the ground and the forefoot is fixed to the ground. Most injuries are treated non-operatively but higher grade injuries in high level athletes that fail conservative management may necessitate surgical intervention.



Resources

Magnetic Resonance Imaging in Orthopedics and Sports Medicine. Stoller D. 3rd Ed. 2007.

Orthobullets

Turf toe: anatomy, diagnosis, and treatment. McCormick JJ, Anderson RB. Sports Health. 2010 Nov;2(6):487-94.

