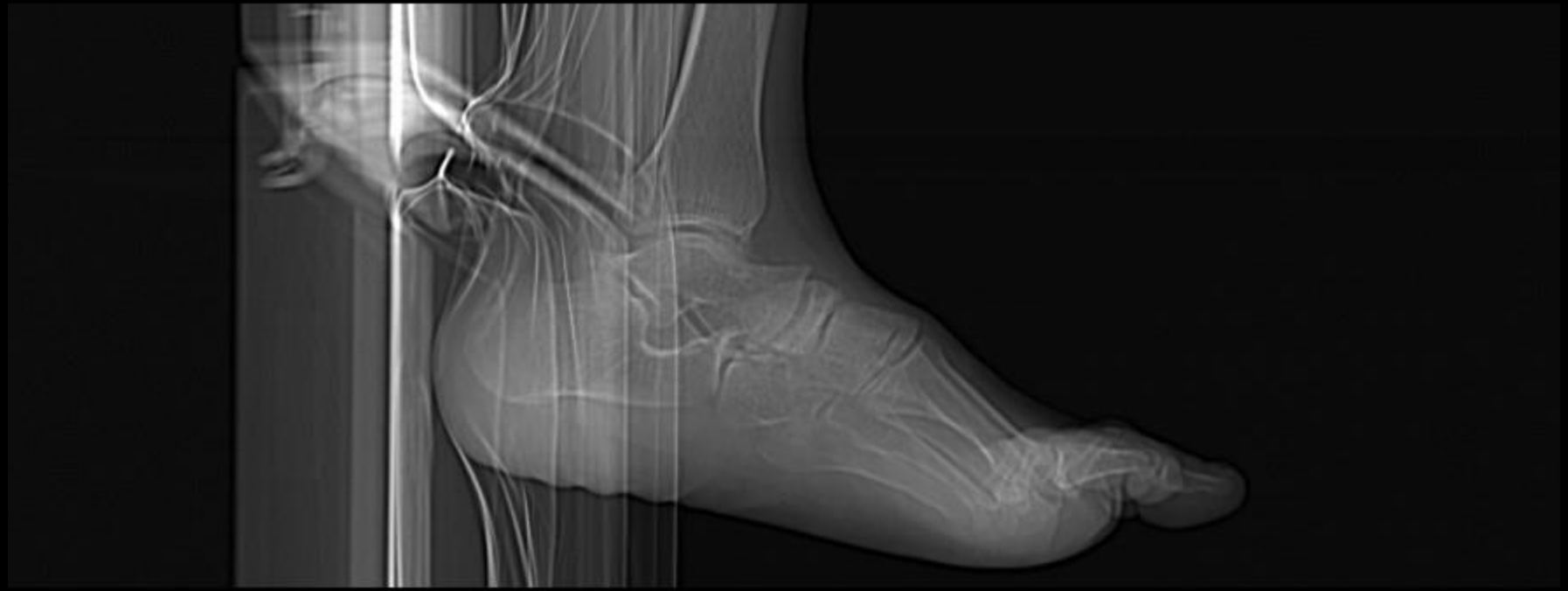
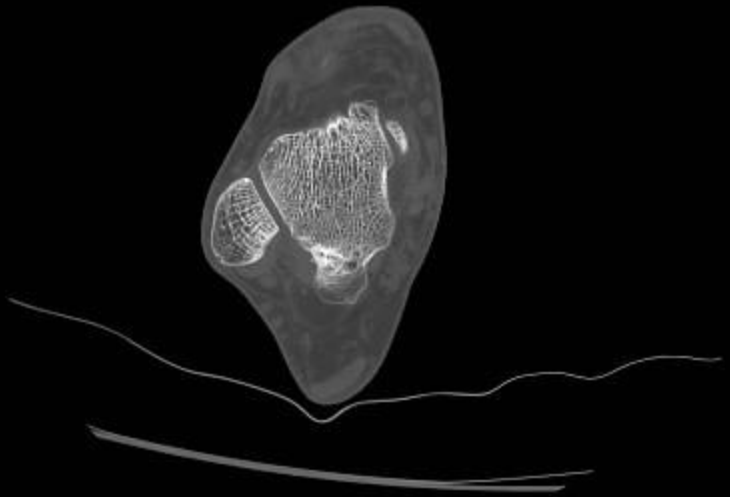
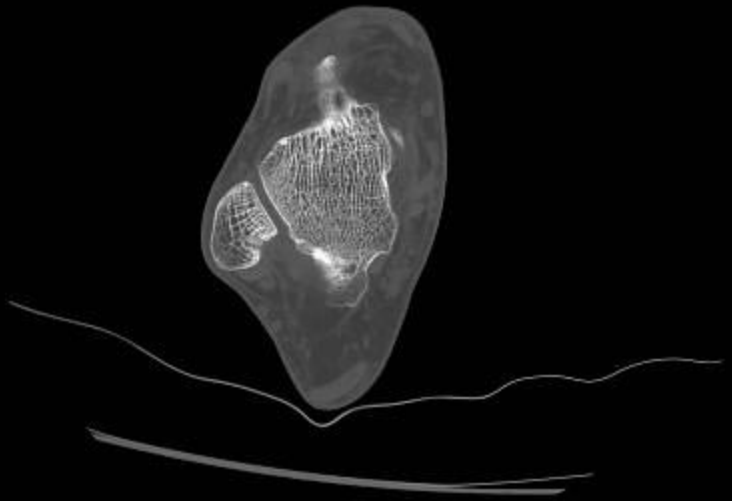
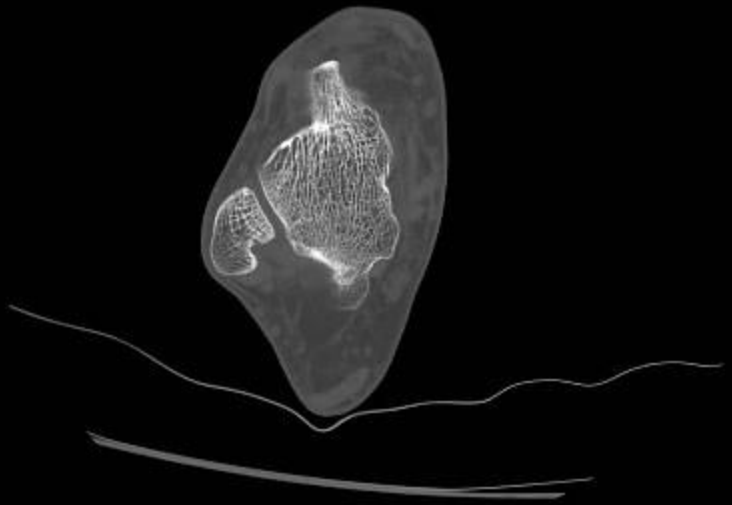
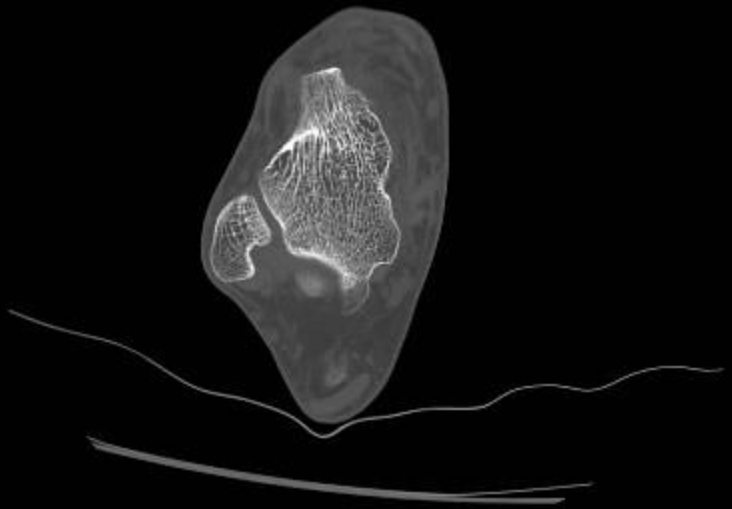
31 M with right midfoot pain

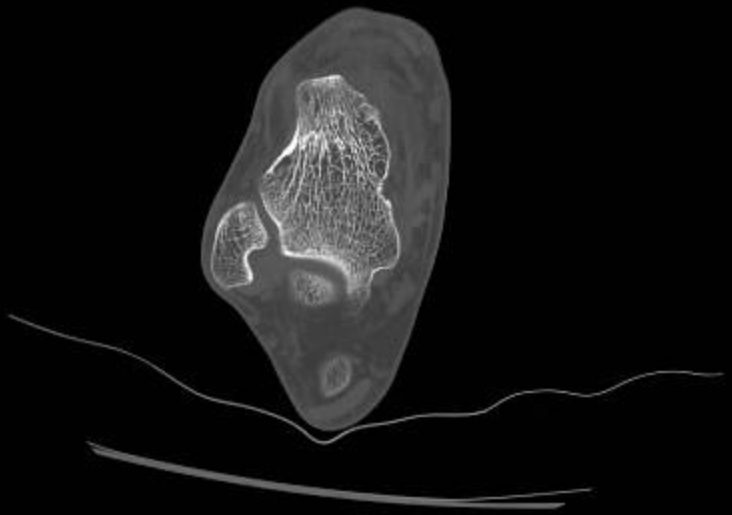


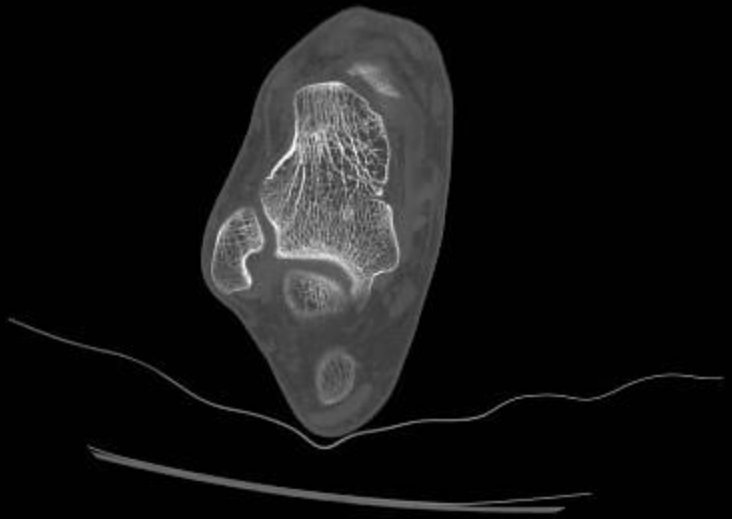


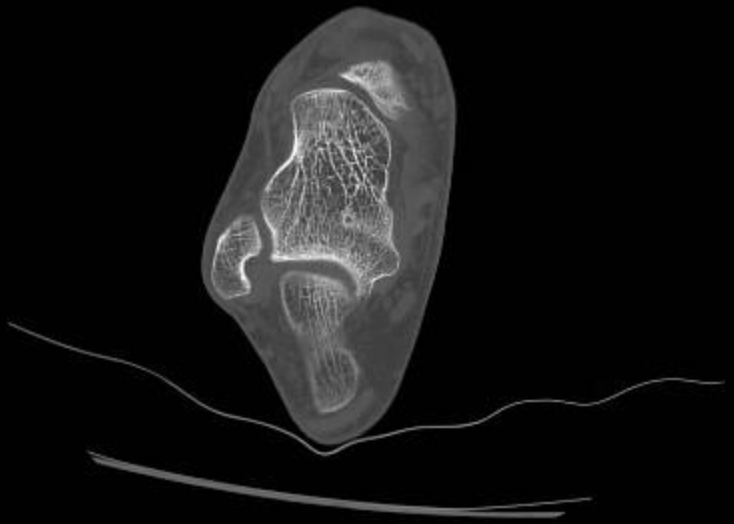


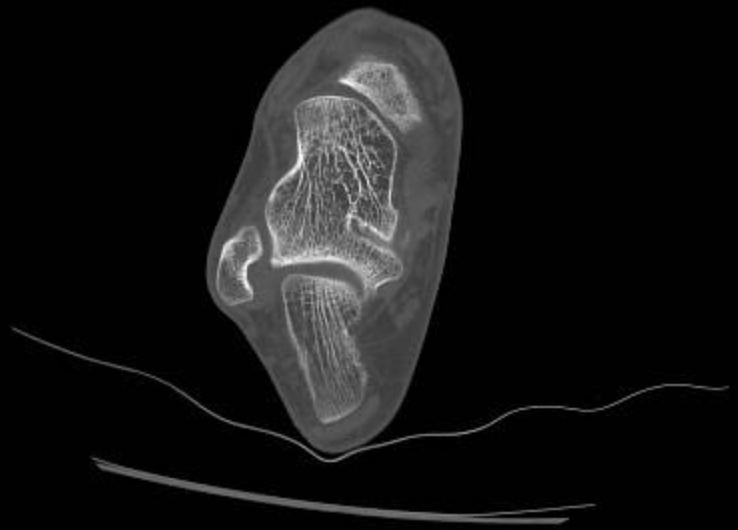


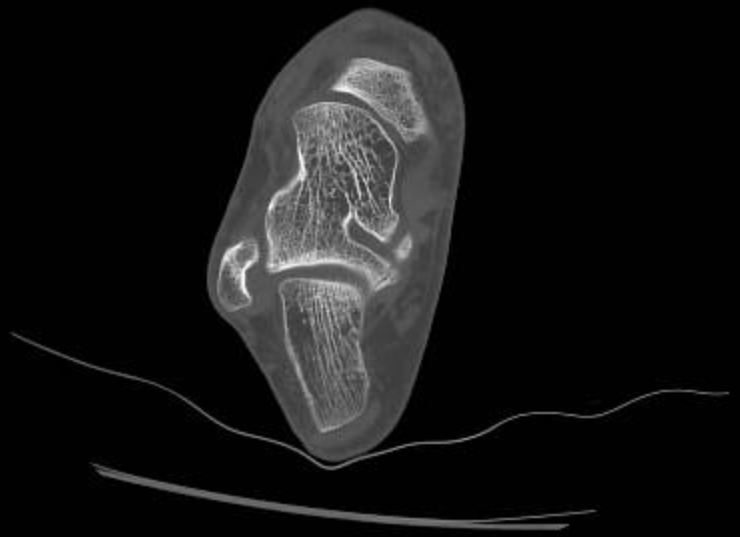


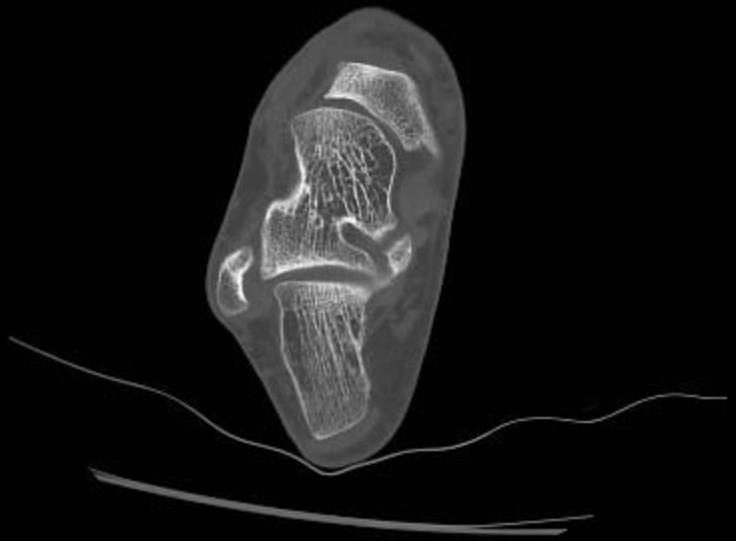


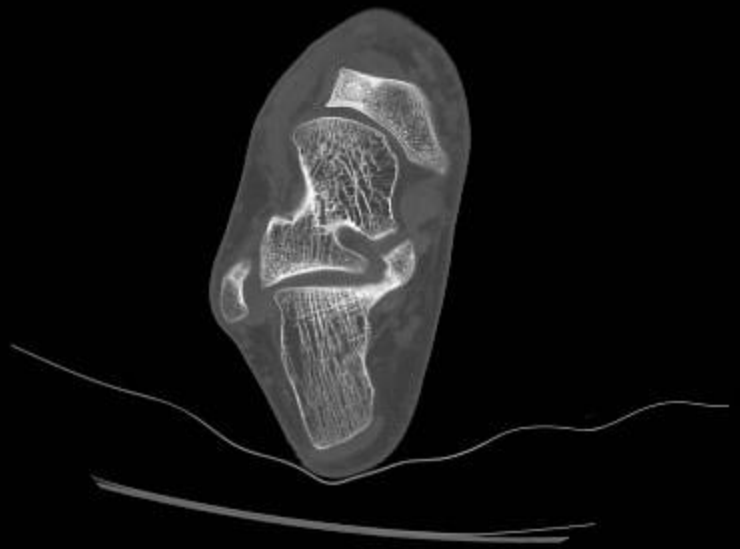


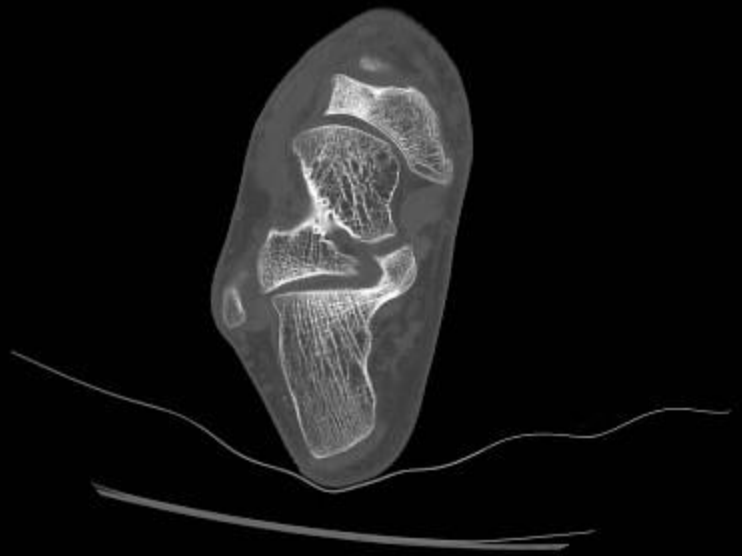


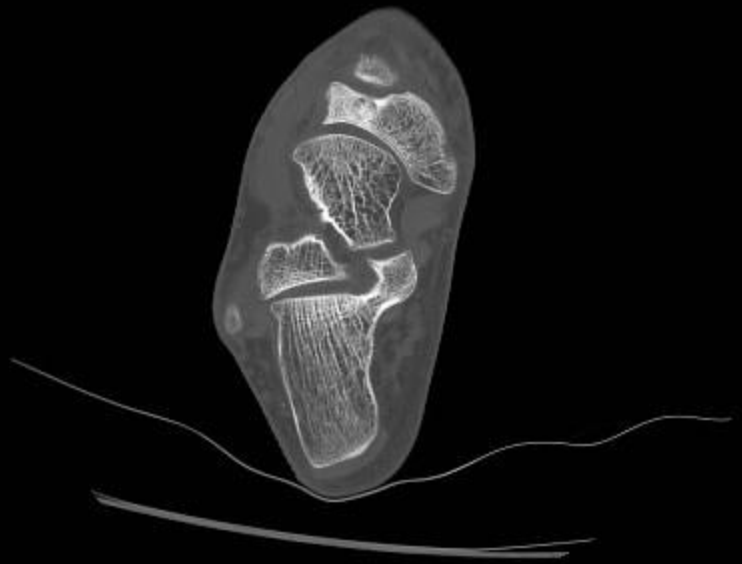


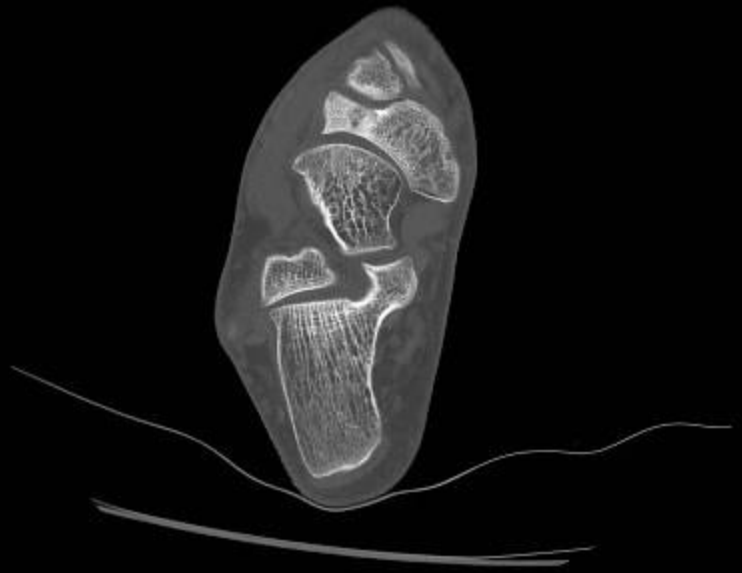


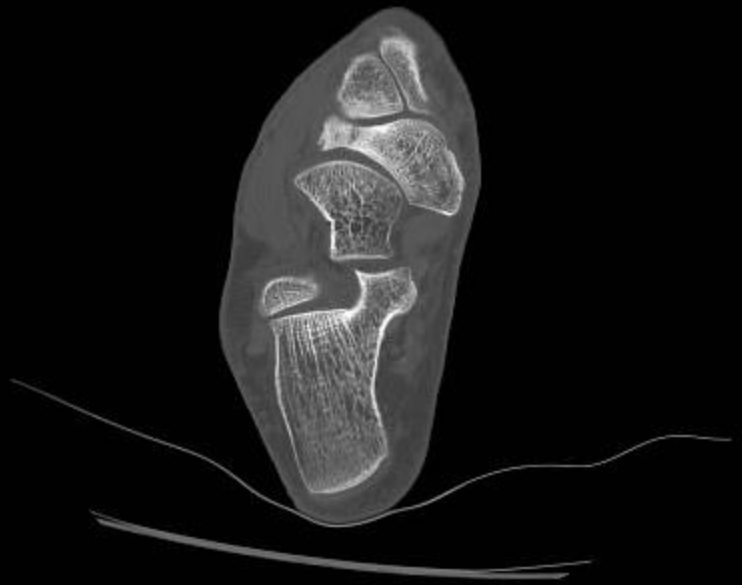


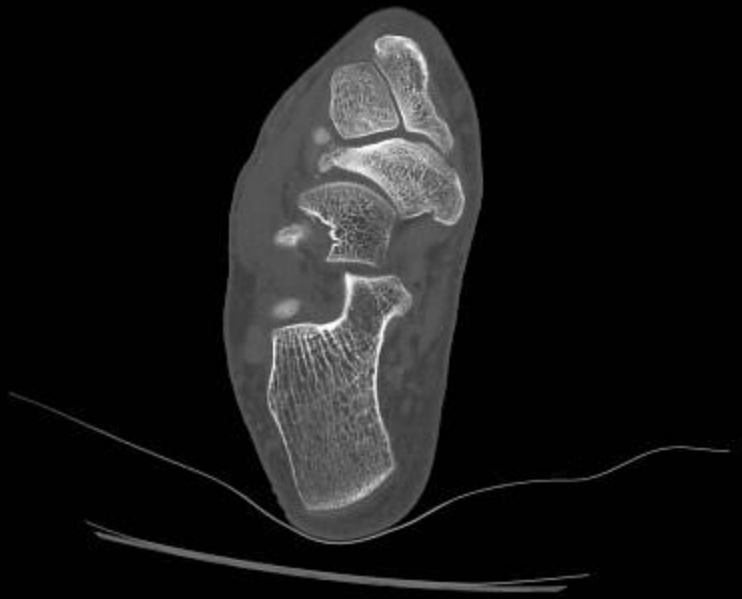


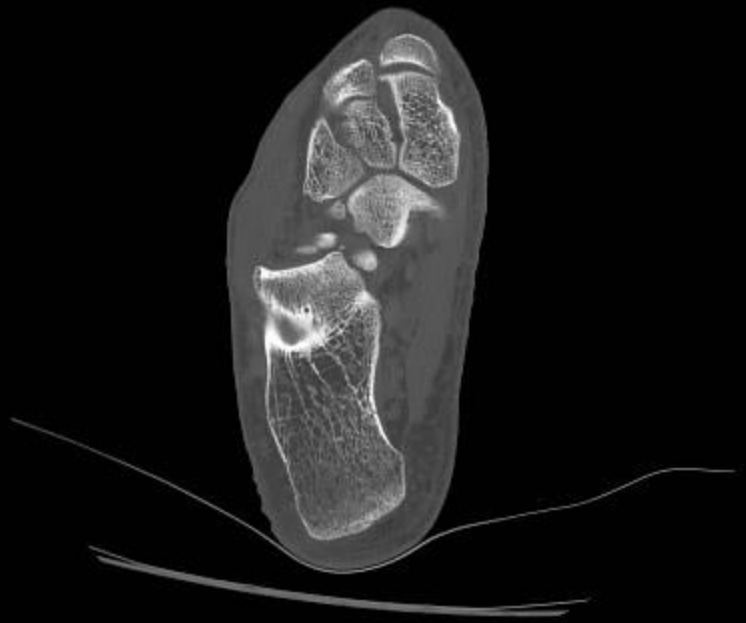


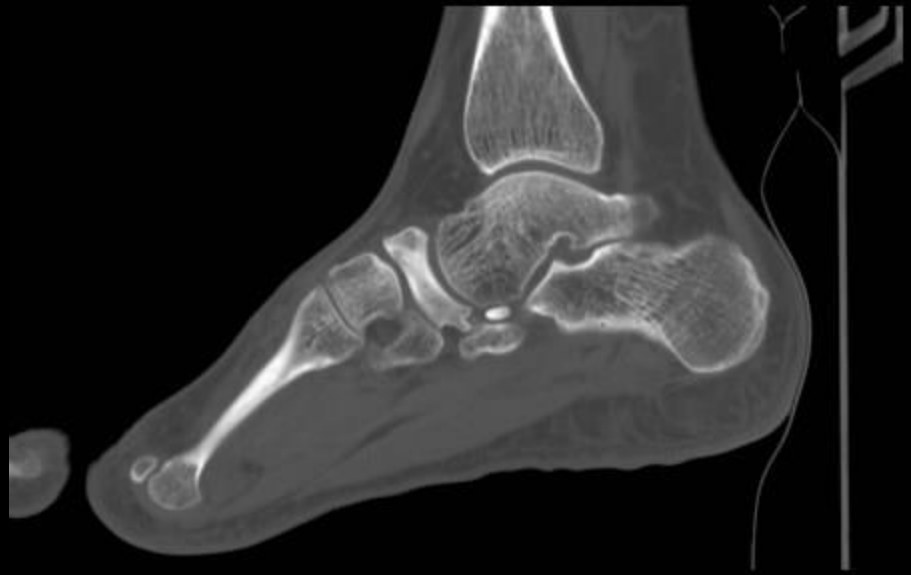












Mueller-Weiss syndrome

Spontaneous tarsal navicular osteonecrosis in adults

2/2 compressive force, congenital defect, or ischemia

Separate from Kohler’s disease (childhood osteochondrosis of navicular)

Navicular

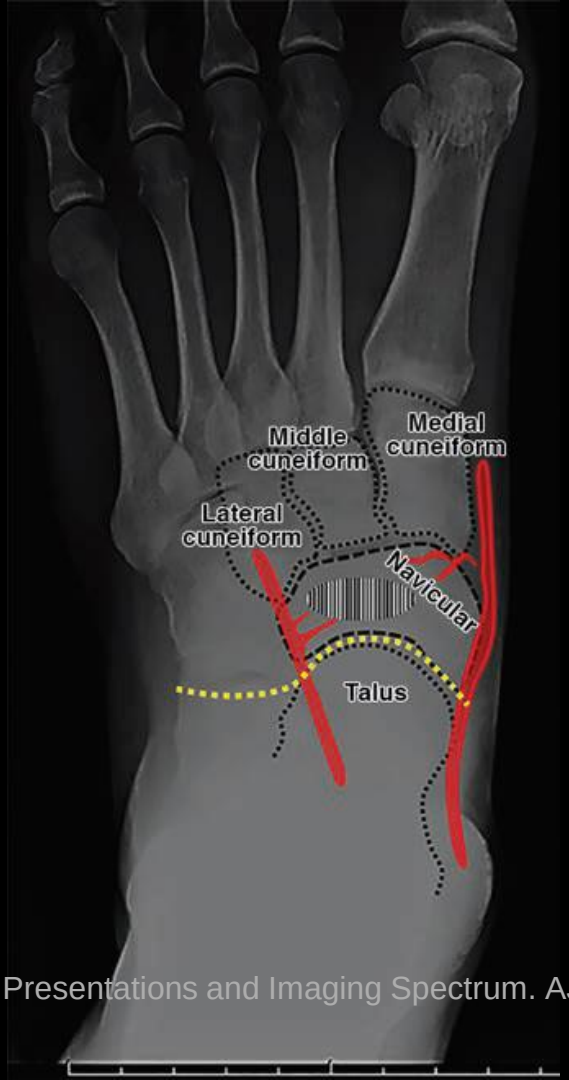
Keystone of medial column of foot

Contributes to both medial longitudinal and transverse arches

Dorsalis pedis artery - dorsal and lateral ⅓

Medial plantar artery- plantar surface

Relative hypoperfusion centrally at area of maximum shear force- may explain prevalence of stress fx and osteonecrosis here



Samim, M, et al. Imaging of Mueller-Weiss Syndrome: A Review of Clinical Presentations and Imaging Spectrum. AJR 2016.

Cause unknown...

Chronic uneven loading on a suboptimally ossified navicular, preferentially compresses lateral half

Navicular is last tarsal bone to ossify, during increased mobility in children

- May be at increased risk of shearing injury at the level of lateral cuneiforms

Extrinsic factors- diabetes, nutritional deficiency, smoking, alcohol, steroid use, rheumatologic disorders, etc.

Clinical presentation

Chronic dorsomedial midfoot pain

Pes planovarus develops, tibia forced into external rotation → altered biomechanics and knee OA

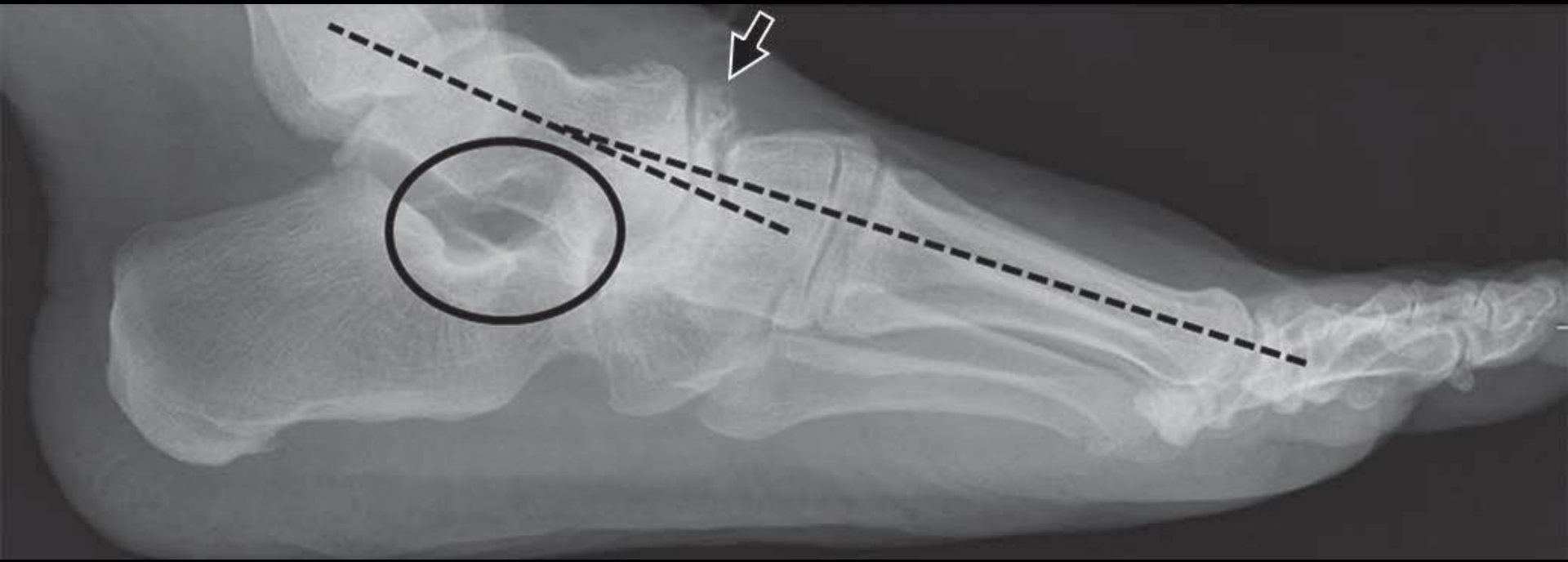
Ankle and Hindfoot

Lateral half of navicular collapses

Lateral subluxation of talar head → hindfoot varus with loss of cyma line

Talocalcaneal angle decreases, large open sinus tarsi due to hindfoot supination

Bartolotta R, et al. Mueller-Weiss syndrome: imaging and implications. Clinical Imaging 2014.



Samim, M, et al. Imaging of Mueller-Weiss Syndrome: A Review of Clinical Presentations and Imaging Spectrum. AJR 2016.

Midfoot

Sclerotic comma-shaped navicular with fragmentation into large medial and small lateral/dorsolateral fragments.

Medial or dorsomedial protrusion of navicular and lateral subluxation of talar head → talocuneiform neoarticulation

Medial subluxation of cuboid with respect to calcaneus (cuboid sign)

Samim, M, et al. Imaging of Mueller-Weiss Syndrome: A Review of Clinical Presentations and Imaging Spectrum. AJR 2016.

Samim, M, et al. Imaging of Mueller-Weiss Syndrome: A Review of Clinical Presentations and Imaging Spectrum. AJR 2016.

Forefoot

Plantar arch fails- metatarsals become parallel, 2nd MT hypertrophies 2/2 lateral shift of compressive forces through 2nd rather than 1st MT and TMT jts

…

...

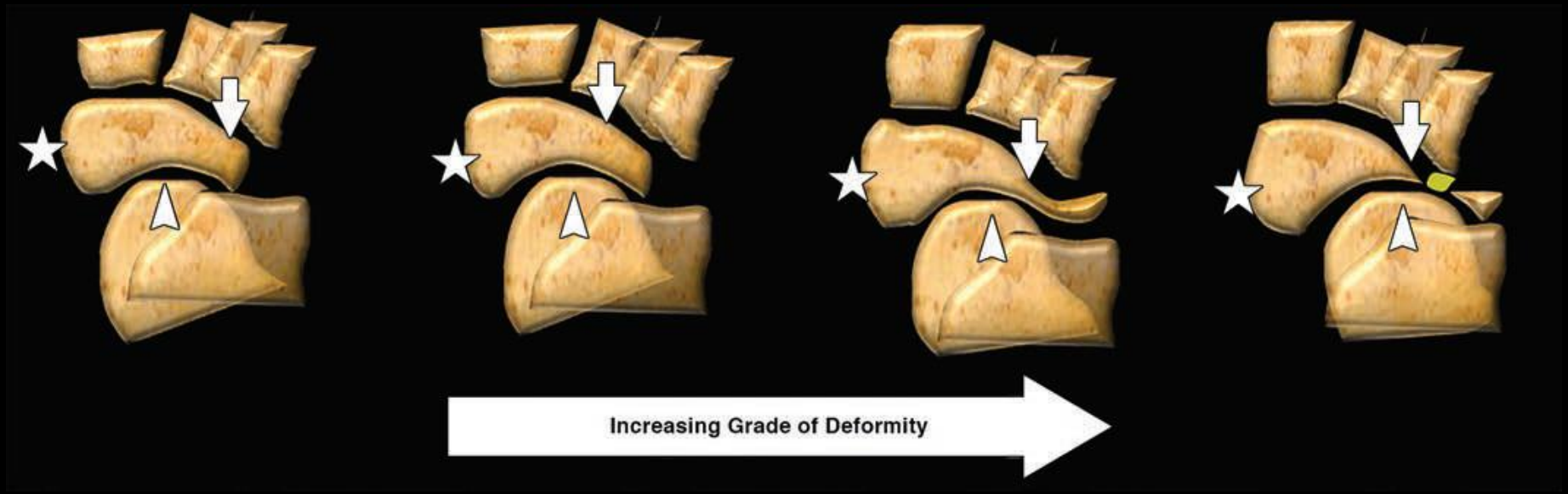
Plantar flexion of talar head leading to paradoxical pes planovarus even though normal calcaneal pitch is maintained

TABLE 2: Five Radiologic Stages of Mueller-Weiss Syndrome

Degree of Severity, Stage	Description of Radiologic Stage
Mild, 1	Radiographs are typically normal, but subtle subtalar varus deformity may be present because of lateral displacement of the talar head, causing it to overlap with the anterior calcaneal process
Moderate	
2	Dorsolateral subluxation of the talus resulting in cavovarus and dorsal angulation of the Meary-Tomeno line
3	Compression or splitting of the navicular resulting in a lowered longitudinal arch and neutral Meary-Tomeno line
Severe	
4	Compression of the navicular leading to rearfoot equinization and loss of the longitudinal arch and plantar angulation of the Meary-Tomeno line
5	Talocuneiform neoarticulation and extrusion of a fragmented navicular ("listhesis navicularis")

Note—Table is based on radiologic stages originally described by Maceira and Rochera [7].

Samim, M, et al. Imaging of Mueller-Weiss Syndrome: A Review of Clinical Presentations and Imaging Spectrum. AJR 2016.



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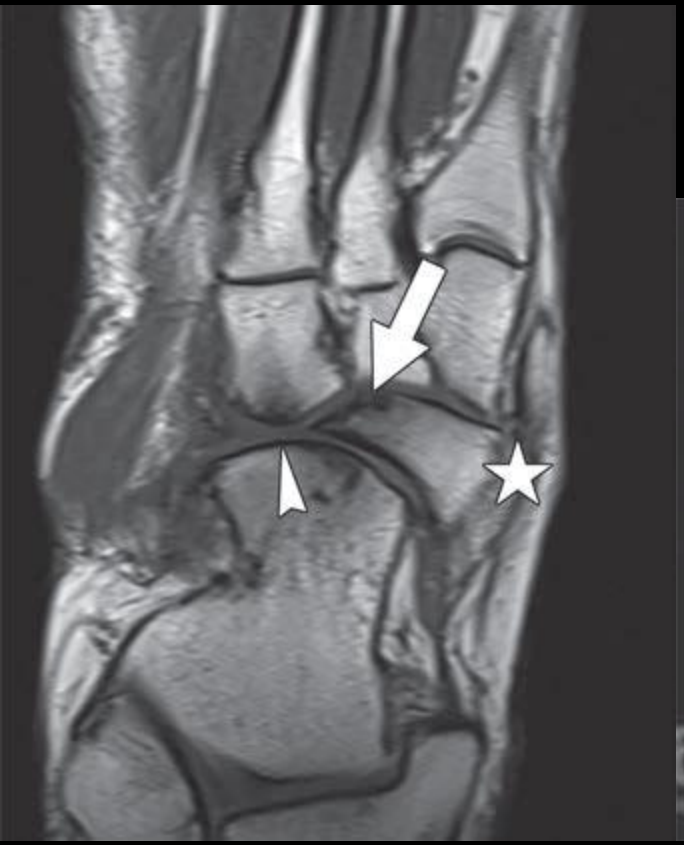

Samim, M, et al. Imaging of Mueller-Weiss Syndrome: A Review of Clinical Presentations and Imaging Spectrum. AJR 2016.

Treatment

Initial- conservative: antiinflammatories, custom orthotics, activity restriction

Surgical- no standard. Majority are stage 3 or worse.

- Relief of pain by fusing symptomatic degenerative joints
- Restoration of plantar and medial longitudinal arches by correcting Meary line
- → Talonaviculocuneiform arthrodesis with bone grafting

Core decompression of navicular, talonavicular arthrodesis, triple arthrodesis

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