

Tarsal Coalition On MR

By William Renner, M.D.

This and other topics will be discussed in

A Weekend Workshop:
One-on-One Musculoskeletal MR
Interactive Cases and Lectures
by William Renner, M.D.

2017 Course - 30 CPD Points RANZCR

Melbourne – July 29-30
Brisbane – Aug 5-6
Sydney – Aug 12-13
Perth – Aug 19-20
Adelaide – Aug 26-27
Hobart – Sept 2-3

Register at www.MSKMR.com NOW and save 10%!

"I can't say enough wonderful things about Dr. Renner's MSK MRI course. Having been to many other Musculoskeletal CME courses over the past couple of years, Dr. Renner has the best by far in my opinion!"
Dr. Joseph Mazzi, Director of MSK,
Stony Brook University, Winthrop University Hospital

Tarsal coalition is a congenital anomaly with fusion of the tarsal bones. The fusion may be bony, fibrous or cartilaginous. **The most common tarsal coalitions are the calcaneonavicular and the talocalcaneal coalition.**

Tarsal coalitions often lead to painful foot, frequent ankle sprain, flat foot deformity and hindfoot valgus. This may lead to peroneal spastic flat foot.

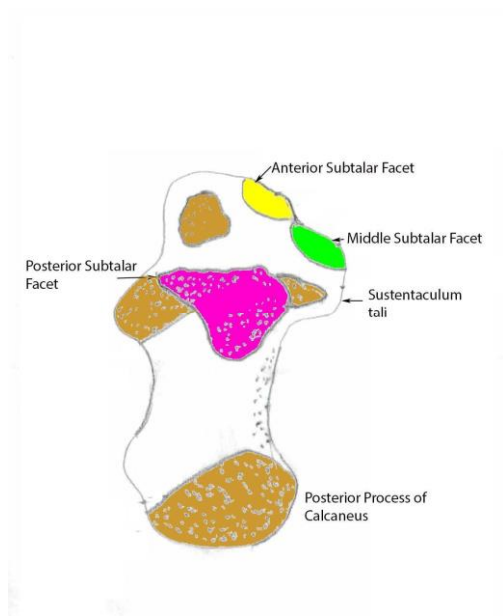
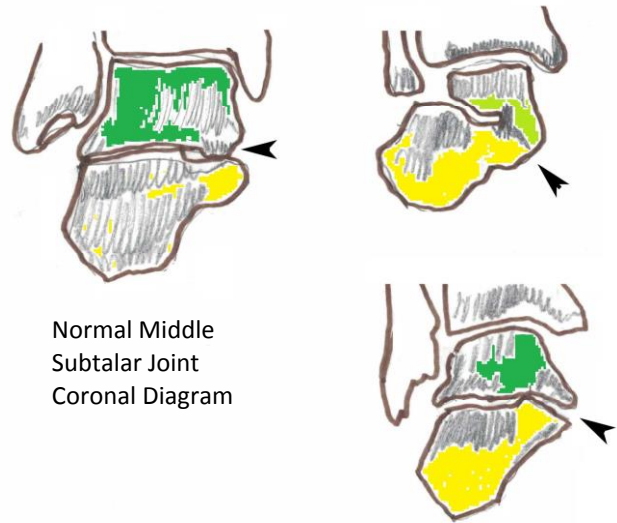
Calcaneonavicular coalition ossifies early and develops symptoms at 8-12 years of age. Talocalcaneal coalition ossifies later and develops symptoms at 12-16 years of age.

Most clinical studies suggest the prevalence of tarsal coalition to be 1% of the population however cadaver studies reveal an incidence of 13%. This would suggest that many tarsal coalitions are asymptomatic or that fibrosis or cartilaginous coalition may have fewer symptoms than bony coalition.

Bony fusions are best detected by CT examination while fibrous or cartilaginous coalitions are best evaluated by MR. 50% of cases are bilateral; 20% have multiple coalitions in the same foot.

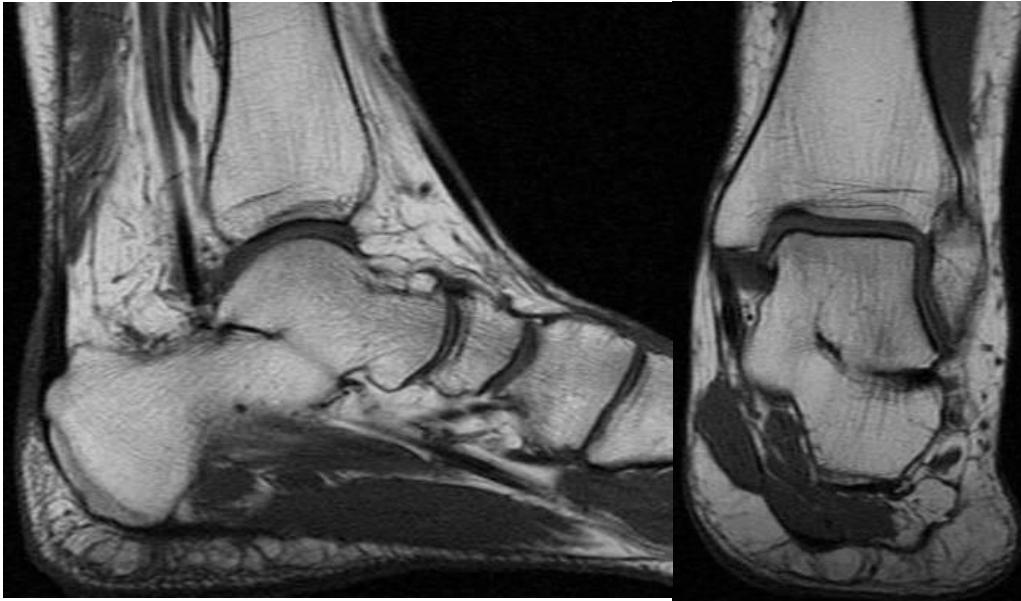
TALOCALCANEAL COALITION

A common sign on coronal view is that the subtalar joint is no longer horizontal but has an oblique orientation. The drunker waiter sign is an abnormal angulation of the sustentaculum tali with the talus has been compared to a waiter having trouble carrying a tray, with the 'tray' angulated instead of horizontal.



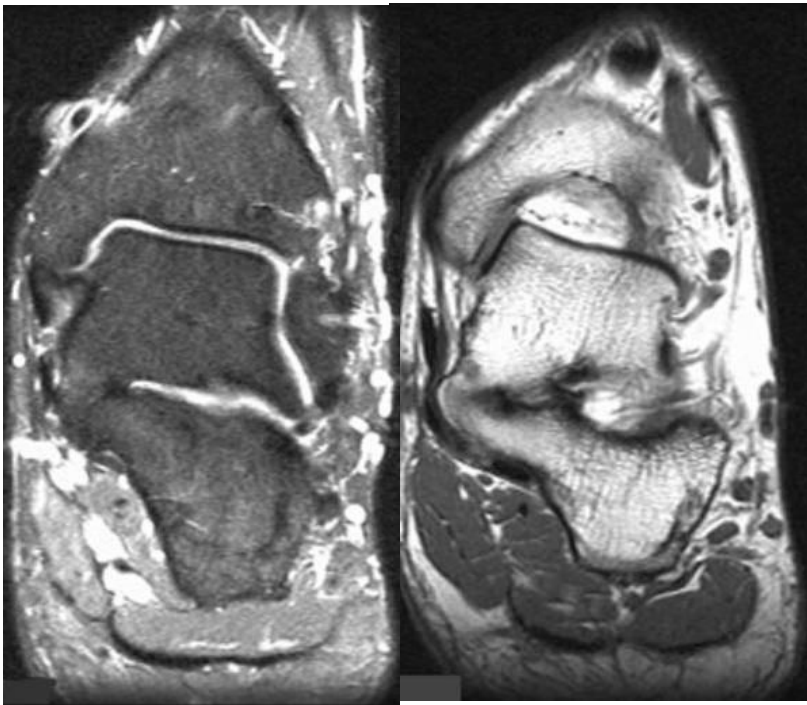
Calcaneal Facets

The talocalcaneal coalition frequently involves the middle subtalar facet of the calcaneus at the sustentaculum tali and middle talar facet of the talus, usually involves the entire joint. Secondary signs are a hypoplastic sustentaculum tali and talar beaks.



TALOCALCANEAL COALITION

MR reveals bony coalition of calcaneus to talus with a continuous marrow signal across the coalition.

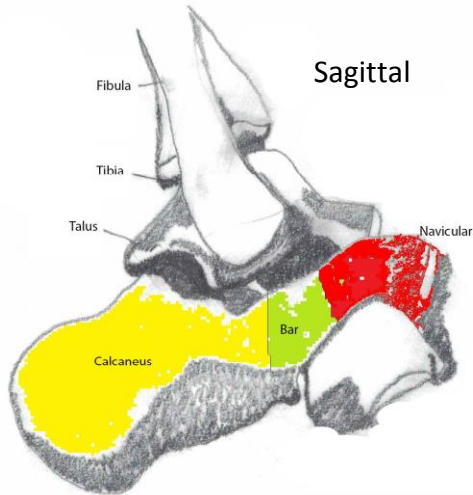


MR reveals bony coalition of calcaneus to talus with a continuous marrow signal across the coalition.

The MR criterion for a bony coalition is a continuous marrow across the coalition. Fibrous or cartilaginous coalitions may have loss of the fat plate at the articulation. Bone marrow edema is frequently seen in the area of the coalition.

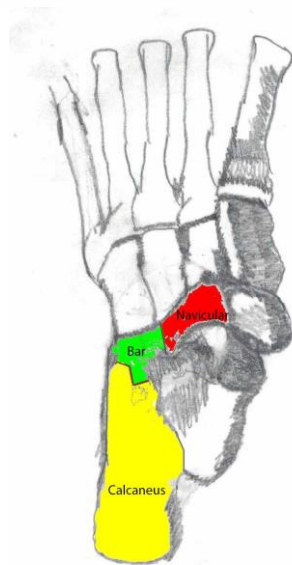
If the connecting tissue is low on signal on both T1 and T2 images it is considered a **fibrous coalition**.

Cartilaginous coalitions frequently have fluid signal at the coalition. If the bridge is gray on T2 weighted images with or without fluid signal the coalition is likely cartilaginous.



Sagittal

Bony fusions are best detected by CT examination while fibrous or cartilaginous coalitions are best evaluated by MR. 50% of cases are bilateral; 20% have multiple coalitions in the same foot.

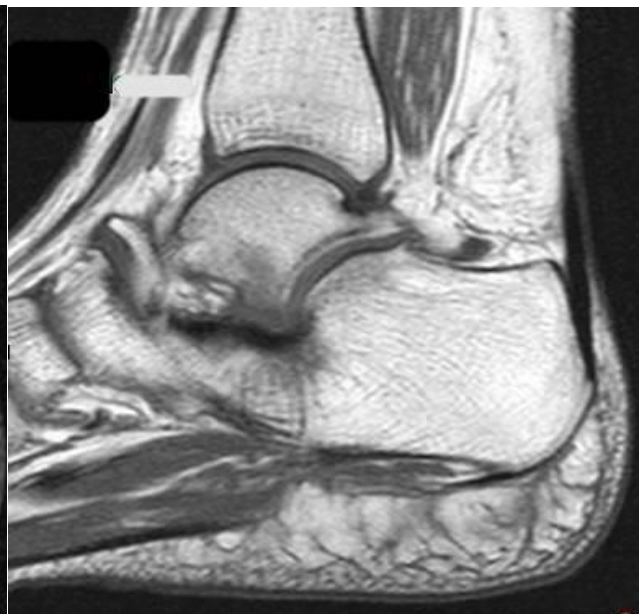
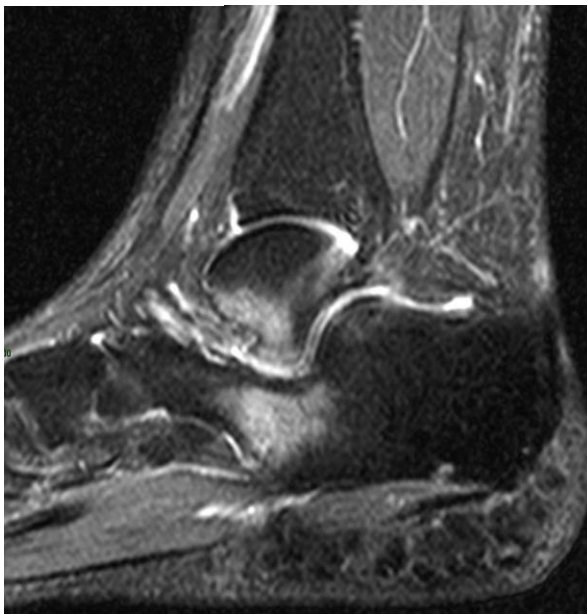


Axial

CALCANEONAVICULAR COALITION: DIAGRAM AND MR

Fusion of the upper and anterior portion of the calcaneal bone with the lateral portion of the navicular bone.

MR exam reveals high signal in the talus and coalition bar due to abnormal stress





CALCANEONAVICULAR COALITION

Calcaneonavicular coalition reveals loss of marrow fat between the calcaneus and the navicular. Secondary signs include a blunted anterior calcaneal process, the anteatler sign (hyperplastic anterior calcaneal process with anterior elongation) and the reverse anteatler sign (hyperplastic navicular with posterior elongation), the talar beak sign with a prominent beak proximal to the talonavicular joint, and marrow edema. Recent studies have suggested calcaneonavicular coalitions tend to be overwhelmingly non-osseous.

Cartilaginous calcaneonavicular tarsal coalition with high signal at the joint. Other changes often present include degenerative changes, ganglion arising from the coalition, sinus tarsi ganglions, and tibialis anterior tenosynovitis.

Other types of coalitions (Calcaneocuboid and talonavicular) are much less common.

Most coalitions are asymptomatic . When conservative therapy fails, **Surgical treatment** of calcaneonavicular coalition is resection of the coalition with interposition of extensor digitorum

brevis muscle or fat graft. Surgical treatment of talocalcaneal coalition is also resection of the coalition if it is less than 50% of the subtalar joint. Triple arthrodesis is performed for large coalitions, failed resections or advanced conditions.