THE UNIVERSITY OF TOLEDO
MEDICAL CENTER

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THE UNIVERSITY OF TOLEDO MEDICAL CENTER
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Tarsal Coalition

Tarsal Coalition is fusion of the tarsal bones that leads to a rigid flat foot, foot pain and multiple ankle sprains. Tarsal Coalition is considered a congenital anomaly.

There are TWO types of tarsal coalitions:

1. Talocalcaneal Coalition – which is a coalition between the talus and the calcaneus. The coronal cut through the talus and calcaneus shows the coalition.

2. Calcaneonavicular Coalition, which is a coalition between the calcaneus and the navicular.

A talocalcaneal coalition usually occurs between the ages 12 and 15. A calcaneonavicular coalition presents at an earlier age.

50% of coalitions are bilateral. Furthermore, about 20% have multiple coalitions in the same foot. Coalitions may be fibrous, cartilaginous or bony. It is believed to occur due to failure of segmentation. It could be associated with fibular hemimelia or Apert's syndrome.

SYMPTOMS:

The patient usually complains of a painful foot. There is a history of repeated ankle sprains, and there may be a flatfoot deformity.

EXAMINATION:

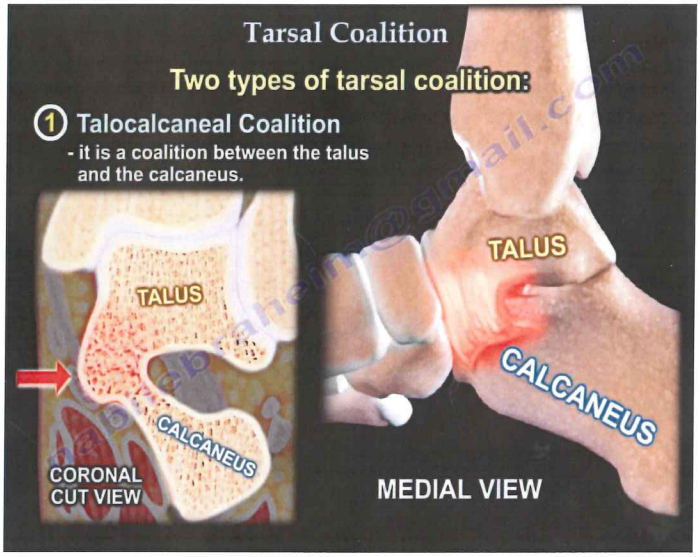
- Tarsal coalition may result in peroneal spastic flat foot.
- On examination, you may also find hindfoot valgus.
- On toe standing, the arch does not reconstitute.
- Heel cord contracture might also be evident.
- Furthermore, there might be restriction of the subtalar joint's range of motion.

It is important to check both feet as the condition may be bilateral.

The best imaging study is a CT scan as it can determine the size and location of the coalition. MRIs are also useful, especially in detecting a fibrous or cartilaginous coalition. An illustration of a coronal cut CT scan shows the coalition nicely.

X-RAYS: AP, lateral and oblique X-Ray views should be obtained.

On a lateral view, the calcaneonavicular coalition will show the characteristic "anteater nose sign" which is elongation of the anterior calcaneal process. A lateral view of a talocalcaneal coalition may show talar beaking which is a type of traction spur that occurs due to limited motion in the subtalar joint.



Additionally, the C sign is a radiological sign which represents the outline of the talar dome and the sustentaculum.

A 45-degree oblique view is considered the best view to detect the calcaneonavicular coalition.

TREATMENT:

Nonoperative treatment usually consists of:

- NSAIDS.
- Modification of activities.
- Brace or cast.

Surgical treatment for calcaneonavicular coalition usually consists of:

- Resection with interposition of an extensor digitorum brevis muscle or a fat graft regardless of the size of the coalition.
- Similarly, talocalcaneal coalitions involving less than 50% of the subtalar joint are also resected.
- A triple arthrodesis procedure is usually reserved for large coalitions, failed resections, or advanced conditions.

Accessory Navicular Bone

What is an Accessory Navicular Bone?

It is an extra bone that may be attached or detached from the navicular bone. It is considered a normal variant present in up to 10% of people. This accessory bone is usually located under the plantar medial aspect of the navicular. It is often associated with a pes planus (flatfoot) deformity.

Ossification of the navicular bone occurs at three years of age in females and at 5 years of age in males. The Accessory Navicular bone on the other hand does not begin ossification before eight years of age.

PRESENTATION:

-The majority of patients are asymptomatic.

-Females are usually more symptomatic.

-The patient may present with an activity related limp and pain in the arch area.

-The condition may also be bilateral.

EXAMINATION:

On examination, there could be swelling, tenderness, warmth or redness in the plantar medial aspect of the arch.

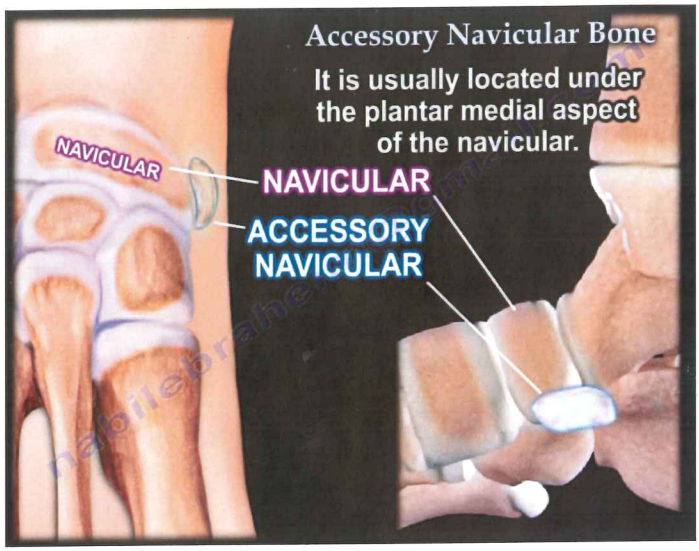
RADIOLOGY:

Relative to a normal foot, a plain x-ray AP view can detect the Accessory Navicular.

An external oblique view is considered the best view to detect an accessory navicular bone.

An MRI can also be obtained to determine the size and type of the accessory navicular as well as assess the posterior tibial tendon.

The Accessory Navicular is classified into three types:



Type I: The accessory ossicle is mainly in the substance of the posterior tibial tendon and is not attached to the navicular.

Type II: The accessory bone lies very close to the navicular tubercle and is connected to the navicular by a thick layer of cartilage.

Type III: The accessory bone is considered an enlarged navicular tubercle. It is essentially a Type II that is fused with the navicular by a bony bridge.

PROGNOSIS: When skeletal maturity is reached, almost all patients become asymptomatic.

TREATMENT:

Non-operative treatment usually consists of activity modification, orthotics or a short leg walking cast.

Surgical excision is indicated only after all conservative treatment options have failed.

Gower's Sign

Gower's sign indicates that there is weakness in the proximal muscles. It is usually seen in Duchenne Muscular Dystrophy (DMD). The sign describes a patient that has to use his hands and arms to walk up his body in order to achieve an erect position. This is due to weakness of the quadriceps and gluteus muscles.

The patient begins in the squatting position. This is followed by slowly lifting the hip and assuming a tripod position. The patient then places his hands on the knees as he slowly walks up his body. When testing a patient for Gower's sign, make sure to perform the test away from any object or structure that the patient may use to aid his movement.

Duchenne Muscular Dystrophy (DMD)

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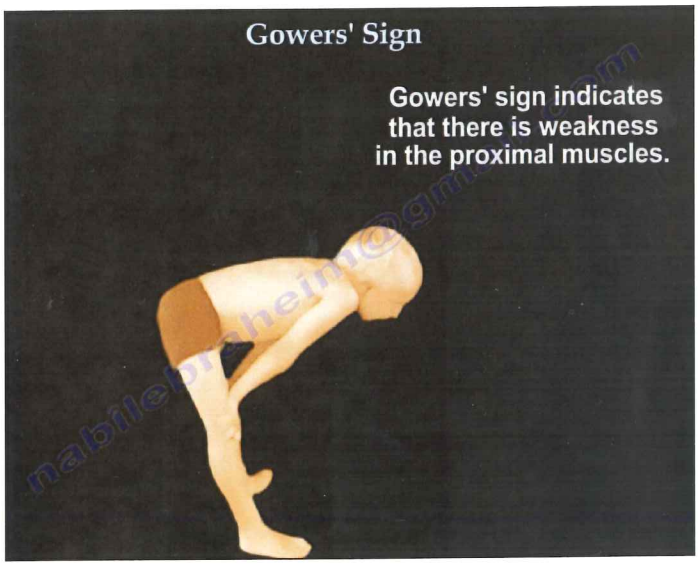


Gower's Sign continued

Patients with DMD show progressive muscular weakness due to the absence of dystrophin. Duchenne Muscular Dystrophy is a genetically transmitted condition that has an X-linked recessive mode of inheritance. Healthy carrier mothers transmit the condition to their male children.

The condition is characterized by progressive loss of motor strength, especially to the proximal muscle groups. Remember that this is a muscular problem not a nerve disorder. Labs may show elevated levels of creatine phosphokinase (CPK) which can reach above 25,000 IU/L.

- The symptoms usually appear before 6 years of age.

- Children will have difficulty standing unaided and ascending stairs.

On examination, one can note:

- Calf pseudohypertrophy.

- Also, an Equinovarus foot deformity may be seen that occurs due to contracture of the gastrocnemius and soleus muscles with persistant function of the tibialis posterior muscle.

- The patient may also get scoliosis which is treated with fusion if more than 20 degrees.

- Cardiomyopathy could also be seen.

As the condition progresses, the muscle is replaced with fat and fibrotic tissue.

Freiberg's Disease

FREIBERG'S DISEASE

Freiberg's Disease is caused by avascular necrosis of the head of the 2nd metatarsal. It is more common in patients who have a longer 2nd metatarsal bone relative to the 1st metatarsal. This leads to the transfer of excessive loads onto the 2nd metatarsal, which may interfere with the blood supply. The condition tends to occur more commonly in young females during growth spurts.

PRESENTATION:

The patient is usually a younger female complaining of pain and swelling at the 2nd metatarsophalangeal joint that is related to activities and walking in high heels.

EXAMINATION:

On examination there may be point tenderness and swelling over the head of the 2nd metatarsal. Furthermore, there may be limited range of motion in the 2nd metatarsophalangeal joint.

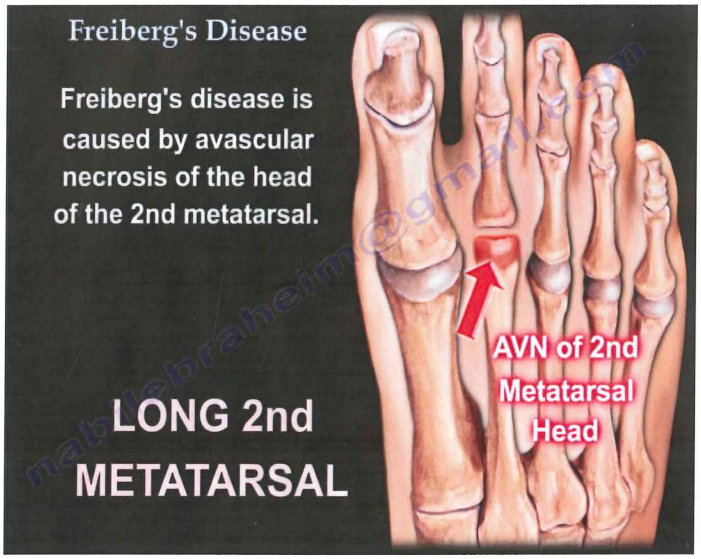
RADIOLOGY:

Early in the disease, x-rays may only show minimal changes and radiological evidence of the condition may only be clearly visible on MRI and bone scans. In more severe cases, sclerosis, fragmentation, collapse of the metatarsal head and severe arthritis could be easily visible on plain x-ray.

TREATMENT:

Conservative treatment usually consists of:

-NSAIDS



-Activity modifications

-Orthotics (e.g., metatarsal bar)

-Immobilization with a short leg cast

Surgical Treatment:

-Intervention involving joint debridement is indicated only after failure of all conservative measures.

-Other procedures may be indicated depending on the complexity and severity of the case.

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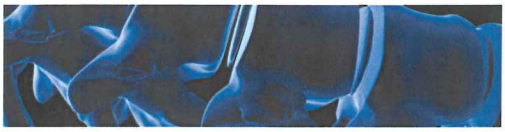
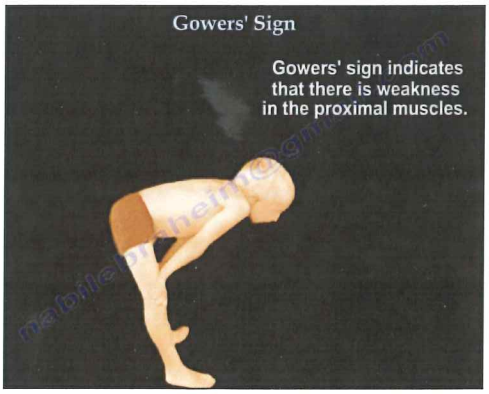


Gower's Sign

See Dr. Nabil Ebraheim's YouTube video on Gower's Sign:

Everything You Need To Know - Dr. Nabil Ebraheim:
https://www.youtube.com/watch?v=0htikR11nU8



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Drs. Ebraheim and Fansa, Amanda Ferguson and Suzanne Payne do not have any Relationships with industry to disclose.

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