Case 9975

Sinus tarsi syndrome
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Section: Musculoskeletal system
Area of Interest: Musculoskeletal soft tissue
Procedure: Diagnostic procedure
Technique: CT
Technique: MR
Special Focus: Inflammation Case Type: Clinical Cases
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Patient: 36 years, male

Clinical History:

36-year-old male patient with complaints of chronic pain in the lateral aspect of the left foot for nearly 5 years especially on weight bearing. A previous history of twisting injury (ankle sprain) was noted.

Imaging Findings:

CT images of the left ankle revealed irregularity with erosions and subchondral cysts involving the inferior aspect of the talus and superior and anterior aspects of the calcaneus.

MRI of the left ankle revealed effacement of the normal fat in the tarsal canal and sinus tarsi at the level of the subtalar joint with loss of definition of the sinus tarsi ligaments. Hypointensity on T1W and ill defined hyperintensity on T2W images was noted in the sinus tarsi. Post contrast images revealed minimal enhancement in the sinus tarsi. Degenerative changes were noted in the inferior talus (roof of sinus tarsi) and superior calcaneus with subchondral cysts. The intrinsic ligaments of the sinus tarsi appeared intact.

CT and MRI findings were diagnostic of sinus tarsi syndrome.

Discussion:

The sinus tarsi is a lateral anatomical space located between the talus superiorly and the calcaneus inferiorly. The anterior and posterior boundaries of this space are the anterior and posterior subtalar joints respectively. This space is medially continuous with the much narrower tarsal canal. The sinus tarsi and tarsal canal mainly contain five ligaments, namely - the cervical ligament, the three roots of the inferior extensor retinaculum (medial, intermediate and lateral roots) and the interosseous talocalcaneal ligament. In addition to these structures both sinus tarsi and tarsal canal contain neurovascular structures and fat. [1, 2]

Sinus tarsi syndrome was first described by O’Connor in 1958, however, its pathogenesis remains unclear. [2] This syndrome is mainly caused by haemorrhage or inflammation of the synovial recesses of the sinus tarsi with or without ligament injuries. It frequently occurs after repetitive ankle sprains or following trauma. It is more commonly seen in young males in the 3rd and 4th decades. Patients usually present with pain in the lateral side of the hind foot at the sinus tarsi. [2]

Pathological examination of the involved tissue has shown features of chronic inflammatory changes, fat necrosis, fibrosis and synovial cysts. [2]

Plain radiographs are usually normal in early stages; however, in advanced cases changes of degenerative arthritis may be evident. Subtalar arthrography was a modality used before the advent of MRI but the sensitivity is low. The value of CT lies in demonstrating secondary osteoarthritic changes in advanced cases. Currently MRI is the imaging modality of choice for diagnosing sinus tarsi syndrome. Sagittal T1W/ PD fat suppressed images are the best
images for evaluation. The characteristic MRI feature of sinus tarsi syndrome is obliteration of fat in the sinus tarsi. Imaging findings include hypointensity on T1W and hyperintensity on T2W images (corresponding to inflammatory changes) or hypointensity on both T1W and T2W images (corresponding to fibrosis) with or without ligament injuries. Osteoarthritis and subchondral cysts may be seen in advanced cases. Contrast enhancement is useful in identifying hypertrophied synovium but is non-specific. [2, 3]

Sensitivity of MRI to pick up cervical and interosseous talocalcaneal ligament injuries is variable. [4]

Majority of the patients respond to conservative treatment including physical therapy, NSAIDs and local steroid injections. When there is failure of conservative therapy, surgical measures like synovectomy, ligament reconstruction or arthrodesis with fusion of subtalar joint may be necessary. [5]

**Differential Diagnosis List:** Sinus tarsi syndrome, Subtalar arthrosis, Tarsal coalition, Inflammatory arthritis, Ganglion

**References:**

MRI imaging of the tarsal sinus and canal Journal: Radiology, 1993, 186:233-240. Author: Klein MA, Spreitzer AM
Figure 1

a

Description: Sagittal CT in bone window shows degenerative changes in the inferior surface of talus and superior surface of calcaneus. Opposite normal foot for comparison. Origin: Dept of Radio Diagnosis, Fr Mullers Medical College Hospital, Mangalore, India

b

Description: Sagittal CT in soft tissue window shows soft tissue density replacing normal fat in the left sinus tarsi. Opposite normal foot for comparison. Origin: Dept of Radio Diagnosis, Fr Mullers Medical College Hospital, Mangalore, India
Description: Sagittal T1W MRI shows effacement of normal fat with hypointensity in the left tarsal canal. Opposite normal foot shown for comparison. Origin: Dept of Radio Diagnosis, Fr Mullers Medical College Hospital, Mangalore, India

Description: Sagittal T1W MRI at the level of left sinus tarsi shows hypointensity and effacement of normal fat. Opposite normal foot shows the normal cervical ligament surrounded by fat. Origin: Dept of Radio Diagnosis, Fr Mullers Medical College Hospital, Mangalore, India
**Description:** Axial T1W MRI shows effacement of normal fat with hypointensity in the left sinus tarsi. Opposite normal foot shown for comparison. **Origin:** Dept of Radio Diagnosis, Fr Mullers Medical College Hospital, Mangalore, India.
**Description:** Coronal T1W MRI shows effacement of normal fat with hypointensity in the left tarsal canal and sinus tarsi. Opposite normal foot shown for comparison. **Origin:** Dept of Radio Diagnosis, Fr Mullers Medical College Hospital, Mangalore, India
Description: Sagittal T2W MRI shows hyperintensity in the left sinus tarsi. Origin: Dept of Radio Diagnosis, Fr Mullers Medical College Hospital, Mangalore, India
Description: Sagittal post contrast T1W MRI shows enhancement in the left sinus tarsi.
Origin: Dept of Radio Diagnosis, Fr Mullers Medical College Hospital, Mangalore, India
**Description:** Coronal graphic representation of the normal sinus tarsi with ligaments. Normal coronal T1W MRI at corresponding level  

**Origin:** Dept of Radio Diagnosis, Fr Mullers Medical College Hospital, Mangalore, India