

IMAGES IN CLINICAL RADIOLOGY



Cubonavicular coalition

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A 40-year old woman, known with bilateral pes planovalgi presented to the hospital, with mechanical pain of some time duration. There was no history of trauma. Clinical examination revealed a decreased range of motion of the right subtalar joint.

An X-ray of the foot showed blurring of the cubonavicular joint, with focal degenerative changes (Fig. A, black arrow).

A sonography was performed, showing signs of synovitis of the intertarsal and subtarsal joints.

On MRI, a narrowed and hazy cubonavicular joint was seen on sagittal STIR (Fig. B) and T1 (Fig. C), and on axial STIR (Fig. D) and T1 (Fig. E) with subchondral cyst formation and bone marrow edema (white arrows).

Diagnosis of cubonavicular coalition was made.

Conservative treatment was suggested. In case of worsening of symptoms surgical resection is an option.



Comment

Tarsal coalitions have a low prevalence (1-2%). Talocalcaneal and calcaneonavicular coalitions are the most frequent. Cubonavicular coalition represents only 1% of all coalitions in the literature reviewed (1, 2).

The cause of tarsal coalitions has been attributed to failure of differentiation and segmentation of the embryonic mesenchyma during the first trimester of intrauterine development (1).

Tarsal coalition is the most common cause of a rigid flat foot in children, adolescents, and young adults (2).

Symptoms of pain may develop as a result of altered biomechanics intertarsal joints, thus generating inflammatory processes (2).

Plain radiography can be diagnostic in certain cases of tarsal coalition.

In cases in which plain radiographic studies are equivocal or difficult to interpret and when tarsal coalition is suspected, MRI or CT should be performed.

MRI and CT have the advantage of differentiating osseous from non-osseous coalitions and can evaluate the degree of joint involvement. They can also depict associated degenerative changes (1).

On CT imaging, there is cortical contiguity in case of osseous coalition. In case of nonosseous coalition, changes may be subtle, with narrowing of the joint space and minimal marginal reactive bone changes (1, 2).

MR imaging of the ankle and hindfoot should be performed in three planes: axial or oblique axial, coronal and sagittal. For the evaluation of most tendon, ligament and articular abnormalities T1-weighted, fast spin-echo proton density-weighted and fast spin-echo T2-weighted images are generally sufficient. The use of at least one fat-suppressed

sequence, usually in the sagittal or coronal plane, is recommended to help identify bone marrow and soft-tissue edema or inflammatory change (1).

On MR imaging, in osseous coalitions, there is bone marrow contiguity across the fused articulation. In non-osseous coalitions, the joint space is reduced. An area of signal intensity similar to that of fluid or cartilage may indicate a cartilaginous coalition. In fibrous coalitions, an area of intermediate- to low-signal intensity may be present in the joint space (2).

Cubonavicular coalition should be included in the differential diagnosis in young patients presenting with foot pain.

References

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2. Newman J.S., Newberg A.H.: Congenital Tarsal Coalition: Multimodality Evaluation with Emphasis on CT and MR Imaging. *Radiographics*, 2000, 20: 321-332.