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Review Article

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BILATERAL MÜLLER-WEISS DISEASE: A RARE CAUSE OF FEET PAIN

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SUMMARY

Müller–Weiss disease, or spontaneous osteonecrosis of the tarsal navicular in adults, is a rare cause of chronic mid-foot pain, characterized generally by a collapse of the lateral portion of the tarsal navicular. In this article, we describe a case of bilateral spontaneous osteonecrosis of the lateral portion of the tarsal navicular in a 56-year-old woman. This case illustrates the diagnostic imaging findings for Müller-Weiss disease.

KEYWORDS: Tarsal navicular, Spontaneous osteonecrosis, Imaging.

INTRODUCTION

Spontaneous osteonecrosis of the tarsal navicular, otherwise known as Müller-Weiss disease (MWD), is an extremely rare condition with limited literature. Although this entity was initially described by Schmidt in 1925, it was subsequently named after W. Müller, who postulated that this condition was either secondary to compressive force acting on the tarsus or a congenital defect, and K. Weiss, who recognized radiographic finding similar to those of lunate necrosis and attributed this navicular deformity to an ischemic process.[1,2]

MWD is a complex idiopathic foot condition, presenting as a chronic mid and hindfoot pain and with deformity of the tarsal navicular in adults. We report a case of bilateral Müller-Weiss disease in a 56-year-old woman. This case illustrates the results of diagnostic imaging for this disease.

PATIENT AND OBSERVATION

A 56-year-old woman with no notable pathological history or notion of previous feet trauma, consulted for bilateral mechanical pain in the ankle and midfoot, occurring with prolonged standing and walking, evolving for 2 years. The physical examination found bilateral pain on palpation and mobilization of the ankle and midfoot. There were no static foot disorders, no sensory-motor deficit, coldness or cyanosis. The inflammatory assessment was normal.

Standard radiographs revealed diffuse increased density of the tarsal navicular in comparison with the adjacent osseous structures in the both feet with collapsus of the lateral portion and the presence of a vertical fissure at the inferior articulr surface of the two navicular bones (fig 1).

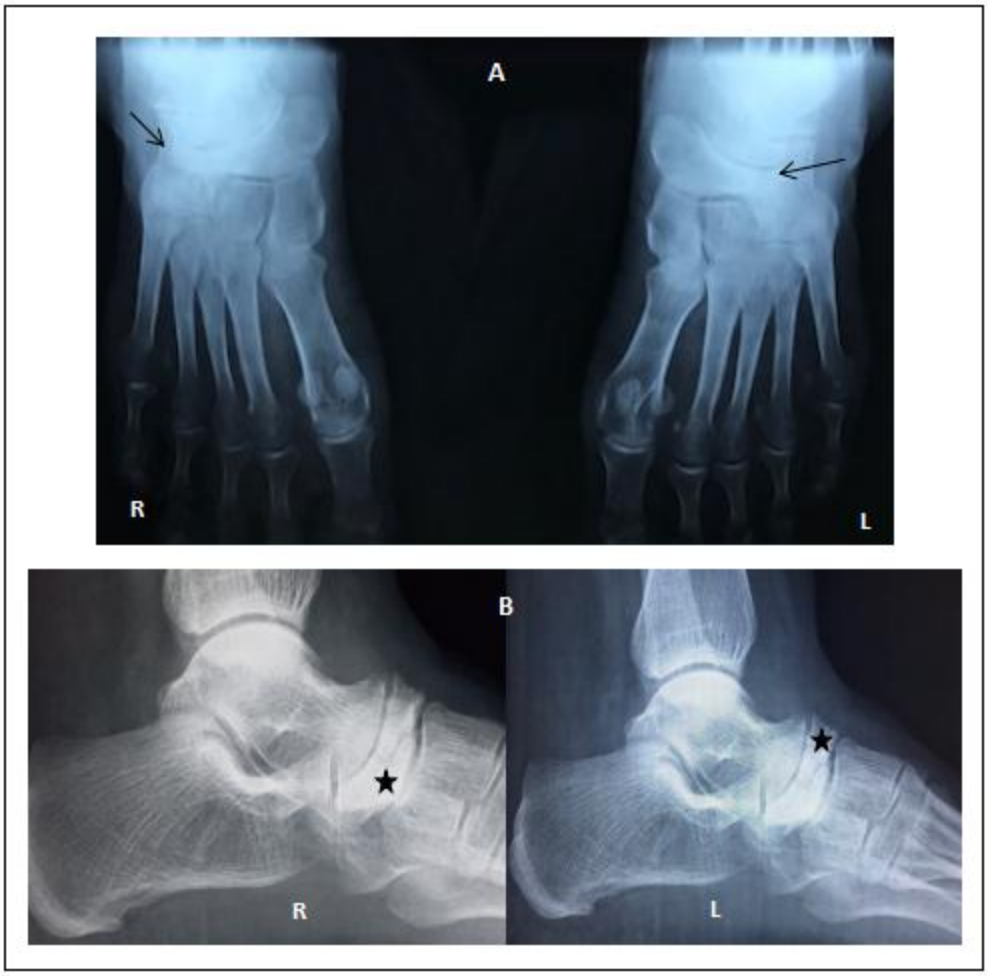

Figure 1: Frontal (A) and lateral radiographs (B) show diffuse sclerosisof the tarsal navicular and collapse of the lateral portion (arrows) of the tarsal navicular in both feet, with a fissure at the inferior articular surface of the navicular bone (stars).

Computerized tomographic (CT) scans of both feet revealed a collapse of the lateral parts of the navicular bones with individualization of a vertical fissure at the lower articular surface, it was associated with bilateral talo-navicular degenerative changes (fig 2).

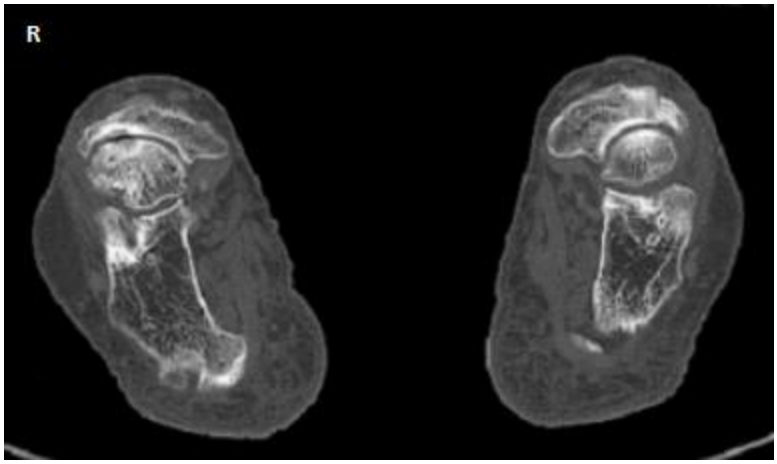

Figure 2: Axial CT Scan of both feet showing a collapsus of the lateral part of the navicular bones, with significant condensation.

Magnetic resonance imaging (MRI) of both feet showed a collapse of the navicular bones respecting the cortical bone associated to talo-navicular osteoarthritis with marginal osteophytosis and geodes, and subchondral talar edema. Tendon and ligament structures were intact (fig 3).

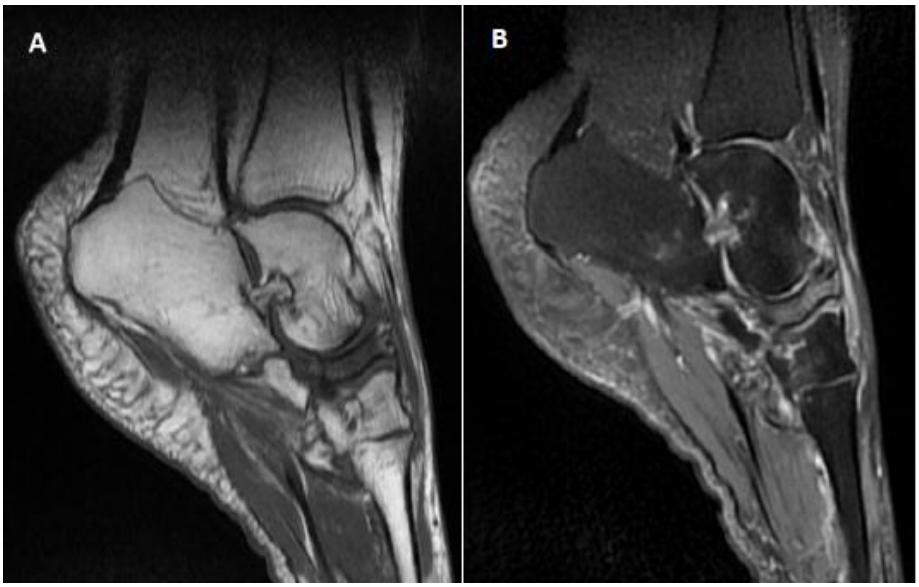

Figure 3: Sagittal MRI of the right foot showing a collapse of the navicular bone with low signal intensity on T1-weighted image (A) and hyper signal on T2-FAT SAT weighted image (B) of the tarsal navicular.

The diagnosis of Müller-Weiss disease was made. Conservative treatment was initiated in the patient including analgesic treatment with mid-foot support orthoses.

DISCUSSION

Müller-Weiss disease is a rare condition, its actual incidence is unknown, witch affects adults, generally between 40 and 60 years, more common in women and is often bilateral.[1-3]

It is characterized by compression of the navicular bone between the talus and the lateral cuneiform bone, leading to spontaneous osteonecrosis of the navicular bone. This lesion is distinct from childhood osteochondritis (Köhler's disease), and navicular necrosis secondary to rheumatoid arthritis, SLE, trauma, corticosteroid therapy and chronic renal failure.[3]

The precise mechanism of spontaneous osteonecrosis of the navicular bone remains uncertain. It has been hypothesized that a chronic disorder of load distribution, with further impairment of the biomechanics of the foot, causes a disturbance of the microvascular system of the navicular.[4]

A large part of the tarsal navicular is vascularized by the medial plantar artery. Chronic stress in the middle of the foot, which blocks blood flow from the branches of the medial plantar artery, can lead to osteonecrosis of the tarsal navicular. The lateral part of the tarsal navicular is more likely to be affected because of the poor blood supply in this area.[5]

The typical clinical appearance includes mechanical pain in the hind and midfoot, increasing with activity, on palpation, the existence of a discreet edema, sometimes with an erythema. There may be dorsomedial convexity of the foot and varus of the hindfoot, the length of the medial arch may be normal or reduced depending on the severity of the disease.[5]

Weight-bearing radiographs in the frontal and lateral projections and clinical examination are usually sufficient to diagnose this disease. Characteristic radiologic changes include comma-shaped osteocondensation of the navicular bone, a decrease in the size of the navicular bone, preceding collapse, and talo-navicular osteoarthritis.[2,5,6]

Maceira proposed 5 stages of increasing disease severity based on radiographic loading profile, these stages are for descriptive purposes, the severity of symptoms may not correspond to the radiological destruction/ deformation of the navicular bone or the stage of the disease.[6]

Magnetic Resonance Imaging (MRI) is useful for eliminating differential diagnoses such as stress fractures or infection. It is also sensitive at picking up bone oedema or early peri-navicular arthritic changes. MRI is also helpful to assess soft tissue structures like tibialis posterior tendon and the spring ligament. CT scan is helpful for assessing bone stock and for pre-operative planning.Technetium-99 m polyphosphate bone scintigraphy is more sensitive but less specific and usually not required on a routine basis.[7]

Initial treatment is conservative and includes anti-inflammatory drugs, weight reduction, personalized orthotics or cast immobilization. Surgical treatment depends on the severity of symptoms and is reserved for cases of medical treatment failure or early on for stages 3 or above according to the Maceira classification.[8]

CONCLUSION

Müller-Weiss disease is a complex idiopathic foot condition and is a diagnostic challenge. This can lead to disabling mid and hind foot symptoms and deformity. A better understanding of this disease and its radiologic manifestations may allow earlier diagnosis and improved future management. Thus, it is necessary to diagnose and treat in time to prevent complications and sequelae.

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