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Freiberg's Infarction In A 12 Year Old Female: A Case Report

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Introduction

Freiberg's disease or Freiberg's infarction, first described by Albert Freiberg[1] in 1914, is a rare condition affecting the metatarsal in which there is osteochondrosis of the head of metatarsal. It is the fourth most common osteochondrosis in the body[2]. The condition is relatively rare and its exact etiology has not been yet discovered. However, repetitive trauma and vascular insufficiency to the metatarsal head are shown to be important causative factors[3,4,5]. Although the second metatarsal is the most common site, it can be found rarely in other metatarsals (most commonly 3rd, followed by 4th metatarsal). The fifth metatarsal is rarely involved[6]. Many systems have been used to stage Freiberg's disease like Simille's[7] and Braggard's[8]. The Braggard's classification requires radiograph of the foot in two planes. Stage I is characterized by flattening of metatarsal head and decreased subchondral bonne density. In type II, there is metatarsal head sclerosis, fragmentation and deformation. Stage III is characterized by arthrosis of MTP joint with intra-articular loose bodies. We present the report of a 12 year old school going girl with previously undiagnosed Stage II Freiberg's disease who was successfully managed with conservative methods.

Case Report

A 12 year old girl presented to us with chronic dull aching pain over the left foot which was aggravated on bearing weight and prolonged activity like walking or running. There was no history of trauma. The parents had initially consulted a local general practitioner who prescribed some medications. However, as the pain did not subside, she was referred to our institute where she was admitted ,examined thoroughly and investigated.

On clinical examination, there was a slight bump over the second metatarsophalangeal joint which was hard and tender on palpation(figure 1). The range of motion of

the left 2nd MTP joint was diminished (25 degrees of dorsiflexion and 0 degree plantar flexion) and painful as compared to the contralateral side. There was no associated joint swelling. On examining the gait, patient was found to be walking without the normal push off phase in left foot. Based on clinical examination, we kept metatarsalgia, Freiberg's infarction, Morton's neuroma and stress fracture of metatarsal as the likely differential diagnoses.

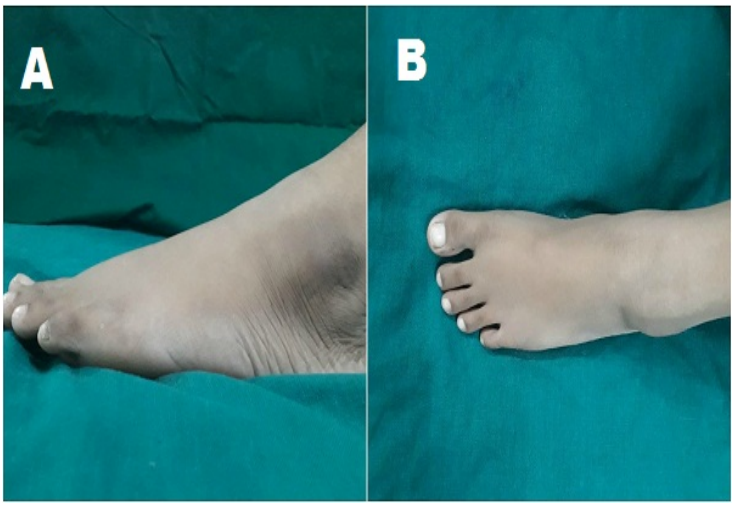

Figure 1-A, B : Clinical images showing slight bump over the second metatarsal head .

Radiographs of the left foot were taken in anteroposterior and oblique views.(Figure 2).The radiographs revealed flattening of articular surface of the second metatarsal head. Also, sclerosis was noted in the metatarsal head. The second metatarso-phalangeal (MTP) joint showed irregularity of articular surface of metatarsal head region. The joint space was preserved with no osteoarthritic change. The rest of the bones and joints were normal. The findings were further confirmed on MRI of the foot (figure 3) which showed marrow sclerosis and edema in the distal metatarsal region. The distal epiphysis of the second metatarsal showed irregular outlines and loss of distal articular sphericity that is, flattening. Thus, the radiographs and MRI findings, along with the clinical findings clinched the diagnosis of Braggard Stage II Freiberg's disease of the second metatarsal head. There was no complain of pain in other metatarsals or other joints. The patient was screened radiologically to rule out osteochondrosis at other sites.

Figure 2- AP (A) and 40 degree oblique(B) views of the left foot showing sclerosis, flattening of the 2nd metatarsal head with irregularity of MTP joint surface-suggestive of Freiberg's disease of left foot.

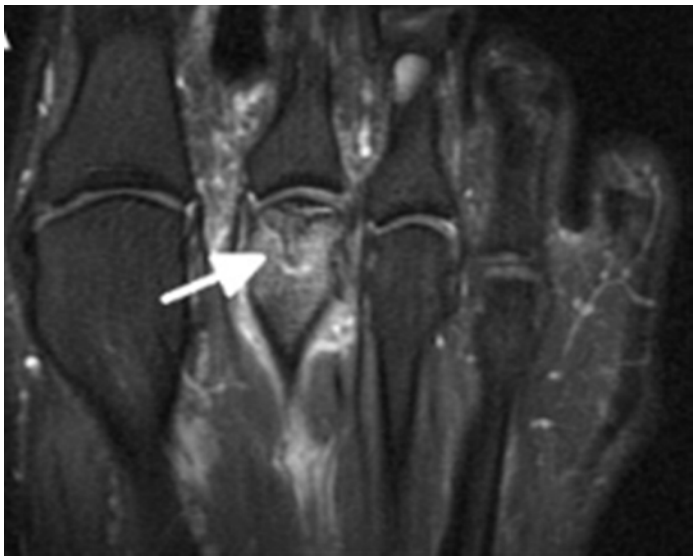

Figure 3- T2 weighted image of the foot showing marrow edema. Sclerosis(arrow) with flattening of articular surface of second metatarsal.

The patient was advised rest for 7 days along with non-steroidal anti- inflammatory drugs given orally twice a day. After her pain subsided, she was counselled on gait training with appropriate footwear modification (footwear with plate which limits movement of metatarsal head).The patient was followed up after 3 months . She had maximum relief of pain with only few occasional recurrences which were mild. She was also able to walk pain free.

Discussion

Freiberg's disease is a rare condition of osteochondrosis of metatarsal head. It most commonly affects second metatarsal though other metatarsals may also be rarely affected[6]. The exact cause of the condition is unknown, but trauma, vascular insufficiency, prolonged steroid use and chronic illness are suggested to be risk factors. Also, a long and less mobile metatarsal is attributed to lead to higher risk owing to repetitive stress, effusion and resulting vascular compromise to the metatarsal head. The disease although most commonly is unilateral, may also present bilaterally[9,10,11,12]. Freiberg's disease is found most commonly among teenagers but can be found in any age group. It is five times more common in females than in males (5:1)[2,3].

The typical presentation is that of a teenager, most commonly female with dull aching pain over the foot, localized to the metatarsal head region. The patient has pain on walking and weight bearing on the affected foot. In advanced cases with arthritis, there may be severe pain, effusion, crepitus and loss of movement at MTP joint.

The diagnosis is essentially radiological, with the 40 degree oblique radiograph being the best view. In the early stage, radiograph typically shows sclerosis and flattening of the metatarsal head, with irregularity of articular surface of the metatarsal head. Advanced cases with arthritis may show loss of joint space, joint depression and loose bodies. The radiographs help in staging the disease as per the Braggard's staging system as described previously. MRI of the foot may also aid in diagnosis. It shows hyperintense areas in region of metatarsal head in T2 weighted images. MRI also shows marrow edema, sclerosis, cortical thickening and flattening of articular surface. MRI is particularly useful in early cases with minimal radiographic findings (widening of joint space) or if surgical treatment is being planned[3,4,5].

Conservative treatment is indicated in stages I and II and includes rest, activity modification, metatarsal pads, insoles, rarely casting and controlled ankle motion boots. Along with these, the role of non-steroidal anti-inflammatory drugs and intralesional steroid injections is also essential. Surgical treatment is indicated in stage III, and consists of joint debridement, osteotomy to decompress metatarsal head, core decompression, bone-grafting and inter-positional arthroplasty in cases of severe joint destruction[3,13,14].

Clinical Message

- Freiberg's infarction is a relatively rare osteochondrosis of the metatarsal head, affecting most commonly second metatarsal , caused due to repetitive trauma and vascular compromise.
- Teenage, adolescent girls are most commonly affected by the disease.
- Conservative treatment by activity modification and footwear changes is advocated in early stages and as initial treatment for advanced cases.
- Surgical management is recommended for advanced cases with arthrosis and severe joint destruction.

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