

# Freiberg Disease: An Interesting Case Managed in a Rural Coal Mines Hospital

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## Abstract

Alfred H Freiberg, in 1914 first described the painful condition of the foot due to partial collapse of the joint surface of the second metatarsal head.[1] He believed that trauma caused the condition, hence used the term infarction. He thought that the excessive length of the 2nd ray in combination with the insufficient first ray complex results into an overload of the 2nd ray and subsequently articular collapse of the 2nd joint surface.

**Keywords:** meta tarso phalangeal; flattened sclerotic

## Introduction

Alfred H Freiberg, in 1914 first described the painful condition of the foot due to partial collapse of the joint surface of the second metatarsal head.[1] He believed that trauma caused the condition, hence used the term infarction. He thought that the excessive length of the 2nd ray in combination with the insufficient first ray complex results into an overload of the 2nd ray and subsequently articular collapse of the 2nd joint surface.[1] Since then various theories are postulated but still today the exact cause and appropriate management of the condition is controversial.

## Case Report

We had a middle-aged lady, teacher by profession, reported in our OPD with complains of vague foot pain. The pain was insidious in onset and dull aching in nature, gradually increasing in intensity, not associated with any history of trauma, aggravated with activity and partially relieved with rest.

Pain was localized to the dorsal surface of the left foot near the 2nd toe base and 2nd meta tarso phalangeal (MTP) joint. There were no local

signs of inflammation. There was localized tenderness at the 2nd MTP joint. The range of motion of the 2nd MTP joint was reduced compared to the right foot.

There was no associated systemic disease like diabetes, hypertension, thyroid disorder etc. No other joint was involved.

We examined the patient with x rays of both the foot, which revealed sclerosis of the left 2nd metatarsal head with flattening of the articular surface of the 2nd metatarsal.

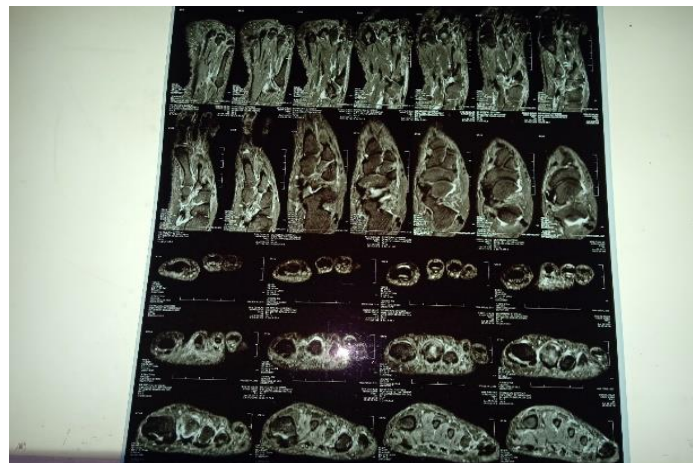
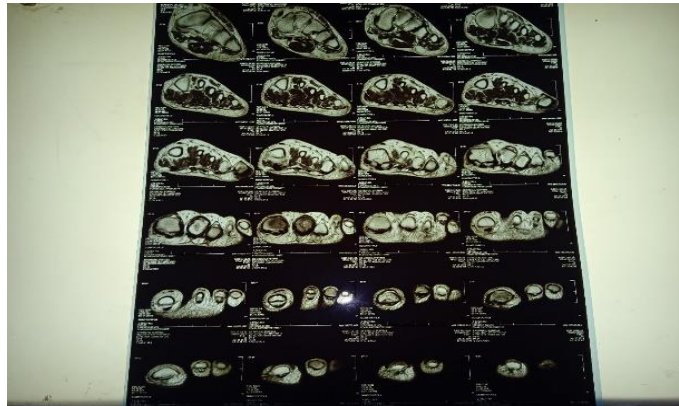
MRI was done to confirm our diagnoses which showed sclerosis of the 2nd metatarsal head with incongruity of the 2nd metatarsal joint surface with sub chondral collapse (Freiberg disease stage 2)

We discussed the disease with the patient explaining the various management options. As she was a teacher by profession so we decided to give her a shoe modification with metatarsal bars, along with non-steroidal anti-inflammatory drugs to give her relief from pain.

We are having a follow up for 1 year and the patient is pain free and pursuing her profession actively.



Flattened sclerotic 2nd metatarsal head



Footwear modification using a soft rubber metatarsal bar to relieve pressure from metatarsal head by local cobbler shop

## Discussion

### Etiology

Although Freiberg himself favored a traumatic etiology for the condition, he admitted that trauma cannot always explain the causation with certainty.[2] In adolescents the disease is thought to belong to a group of diseases involving the growth disturbances of the epiphysis or the apophysis, i.e., osteochondrosis. [3] The adult-onset form of the disease however is different from the juvenile form although they behave almost similarly radiologically. Unlike other osteochondrosis it is not associated with smoking, steroid use or alcoholism. Most authors today believe that Freiberg disease is probably multifactorial in origin where the initial insult is traumatic or vascular. [3] Infection is almost certainly ruled out to be an etiological factor. [4]

### Epidemiology

Freiberg disease is an uncommon medical condition. The male to female ratio is 1:5. Again, this female preponderance is very uncommon in other osteochondrosis where males are more affected.[5] In almost 95% cases the 2nd and the 3rd metatarsals are affected with the second metatarsal is the most commonly involved 5, bilateral involvement is seen in 10% patients.[6]

### Clinical presentation

Usually, the patients of Freiberg disease complain of a vague forefoot pain which typically is activity related. It may or may not be associated with a history of trauma.

Physical examination usually reveals swelling, tenderness over the affected metatarsophalangeal joint with limited range of motion. Sometimes a skin callus may be seen on the planter surface of the affected ray.

### Investigation

Beside blood investigations, antero - posterior and oblique radiographs are required as basic investigation for the diagnosis. Depending upon the stage of the disease the radiograph may show only sclerosis and joint space widening in early stage and complete collapse and fragmentation in later stage.[7]

### Advance radiology

MRI is helpful in detecting Freiberg disease when it is radiographically not seen. [8] It shows hypo intense signals in the epiphysis on T 1 images and mixed hypo intense and hyper intense signals in T2 images.[4]

Although bone scintigraphy is used in the study of Freiberg disease its value as a diagnostic or prognostic tool is undecided.[6]

### Histology

Different studies have found histological evidence of bone resorption and new bone formation depending upon the stage of the disease.[9]

### Staging

Various radiological staging is advocated for Freiberg disease. Most often quoted amongst them is the Smillie classification (1967) based upon the x ray changes in the affected metatarsal and metatarsophalangeal joint.[10]

- Stage 1- fissuring of the epiphysis (very subtle x ray changes)
- Stage 2- central depression of the articular surface with collapse of the sub chondral bone

- Stage 3-central depression with medial and lateral projection at the margins
- Stage 4- the central portion sinks below the surface and becomes a loose body
- Stage 5- marked flattening and deformity of the metatarsal head with secondary degenerative changes

### Treatment

Current recommendations are based upon small series of patients treated by various methods, therefore there exists a clear therapeutic consensus.

Some patients of Freiberg disease may resolve spontaneously.[11]

A trial of conservative therapy along with non-steroidal anti-inflammatory drugs can be implemented in most of the patients in the early stages. A non weight bearing cast may be used in patients with acute pain in the early stage of the disease for 4-6 weeks. While patients with chronic pain may be benefitted with short leg walking cast or a hard sole shoe .11 Patients with chronic problems may also benefitted with metatarsal bars or rigid shanks or a rocker bottom shoe etc. along with activity modification. The aim of all these nonoperative measures is to give rest to the involved joint and off load it.[4]

Several surgical options have been advocated for treatment of Freiberg disease. They range from debridement of the involved joint with removal of the loose bodies to various osteotomies, elevation of the depressed metatarsal head with bone grafting, core decompression, metatarsal head excision, shortening of the metatarsal, proximal phalanx hemi phalangectomy, total small joint arthroplasty and various combination of the above.[12]

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