

# Freiberg's Avascular Necrosis: A Case Report

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## Abstract

**Background:** Freiberg's disease is an uncommon condition typified by bony infarction of the second metatarsal head with a vague multifactorial etiology which tends to mostly occur in women.

**Case Report:** A 22-year-old woman presented with second metatarsal head local pain exacerbating while walking without any prominent previous trauma history; clinical and imaging workups revealed metatarsal head osteonecrosis of Freiberg's infarction.

**Conclusion:** It should be kept in mind that for those complaining of forefoot discomfort, especially in the region of metatarsal heads, Freiberg's avascular necrosis (AVN) could be a potential pathology.

**Keywords:** Freiberg's Disease; Metatarsal Bones; Osteonecrosis; Treatment

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## Background

Freiberg's infarction, initially introduced by Alfred Freiberg in 1914, is typified by avascular osteonecrosis of lesser metatarsal heads. Freiberg's infarction is a rare condition but no precise prevalence rate has been reported for it. There is a preponderance of adolescent females but the condition could present at any gender and age. The condition usually presents with gradual pain while walking and swelling on the metatarsal heads. The diagnosis is based on clinical exams and imaging. The treatment options include conservative managements, core decompression, and corrective osteotomies (1-3).

Here, we present a case of 22-year-old woman with Freiberg's infarction of the second metatarsal head who responded well to core decompressive drilling.

## Case Report

A 22-year-old female commercial visitor presented to the orthopedic clinic in Akhtar hospital, Tehran, Iran, with pain in the right dorsal forefoot, which began two months ago and involved plantar foot. She described it as a continuous dull pain that exacerbated by walking. The patient had no pain relief after taking non-steroidal anti-inflammatory drugs (NSAIDs) for several weeks. No clear traumatic event was reported.

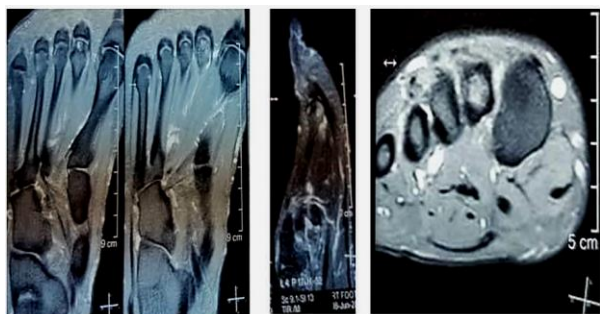
In physical examination, there was marked tenderness around the second metatarsophalangeal (MTP) joint, especially on the metatarsal head. There was no obvious swelling and erythema. Radiographs of the foot showed the second metatarsal head flattening and subchondral sclerosis (Figure 1). Magnetic resonance imaging (MRI) illustrated signal hyper-intensity on T2-weighted images (Figure 2). Considering clinical and imaging data,

Freiberg's avascular necrosis (AVN) was confirmed and the patient was scheduled for surgery.

The second MTP was opened by dorsal incision. The infiltration of serosal fluid and excessive synovium were drained and excised.



**Figure 1.** The X-ray depicting showing sclerosis and slight flattening of the second metatarsal head



**Figure 2.** Coronal, sagittal, and axial magnetic resonance imaging (MRI) sequences; the low signal intensity in subarticular area of the metatarsal head on T1-weighted images, increased signal intensity on corresponding T2-weighted images, and associated mild deformity are in favor of Freiberg infarction.

As the osteonecrosis was in stage 1, core decompression of the metatarsal head was performed by drilling (Figure 3).



**Figure 3.** The second metatarsal head after core decompression and synovectomy

The patient was discharged with a short toe-plate for one week, along with activity modification. After 6 months, she was free of symptoms and had no problem while walking; the AVN was resolving on follow-up radiographs (Figure 4).



**Figure 4.** Six months postoperative follow-up radiography showing the resolving avascular necrosis (AVN) of the second metatarsal head

## Discussion

Freiberg's AVN is an infrequent condition defined as osteonecrosis of the metatarsal head, mostly the second metatarsus. It mainly occurs in young adults especially women but the etiology is multifactorial and not fully understood. The signs and symptoms are usually swelling, pain, and tenderness in the region of the affected MTP joint (1, 2). The radiologic manifestation is characteristic with flattening of the second metatarsus head, sclerosis, fragmentation, and formation of joint loose body. MRI shows edema and signal change in the marrow of the affected metatarsal head. The signal intensity is low on T1 and high on T2-weighted images (1, 3).

In stage 1, although the lesion is evident on MRI, no significant necrosis is detectable in operating room. Most patients are healing self-limitedly and conservative therapy, including rest, castings, and crutches, is sufficient. Operative option is indicated for patients who fail conservative treatment, as we experienced in this case. The surgical plan preferred by many surgeons includes osteotomy of the metatarsal neck, joint synovial debridement to metatarsal head, core decompression by drilling, and resection (1, 2, 4).

## Conclusion

Localized metatarsal head pain should trigger a possible diagnosis of Freiberg's infarction; core decompression drilling could be beneficial in the treatment of this condition.

## Conflict of Interest

The authors declare no conflict of interest in this study.

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