SVOA Orthopaedics
ISSN: 2752-9576

ScienceVolks Open Access

Case Report

Technique for the Treatment of Freiberg Disease – A Case Report

Julián David Molano Castro[1]*, Karol Gabriela Rubiano Ortiz[2], Nuria Boo Gustems[3]

[1]Foot and Ankle Surgeon - Hospital Universitario Mayor, MEDERI, Bogotá, Colombia – Fundación Sanitaria Mollet, Mollet, Spain.

[2]Orthopaedic and Traumatology MD - Universidad del Rosario, Bogotá, Colombia.

[3]Foot and Ankle Surgeon – Consorci Sanitari Integral, Sant Joan Despi, Spain.

***Corresponding Author:** Julián David Molano Castro, Foot and Ankle Surgeon - Hospital Universitario Mayor, MEDERI, Bogotá, Colombia – Fundación Sanitaria Mollet, Mollet, Spain.

https://doi.org/10.58624/SVOAOR.2025.05.006

Received: March 17, 2025

Published: April 15, 2025

Citation: Molano C. JD, Rubiano O. KG, Boo G. N. Technique for the Treatment of Freiberg Disease – A Case Report. *SVOA Orthopaedics 2025,* 5:2, 38-41. doi: 10.58624/SVOAOR.2025.05.006

Abstract

Avascular necrosis of the metatarsal head, as described by Freiberg, is a condition primarily characterized by pain. It most commonly affects the second metatarsal and progressively damages the involved metatarsophalangeal joint. Although several treatment techniques have been described, there is no clear evidence supporting the superiority of one approach over another. In this article, we describe a previously unreported technique used in a patient who achieved excellent results and recovery. The procedure involved excising the metatarsal head and replacing it with a tendon graft.

Keywords: *Freiberg Disease, Avascular Necrosis, Metatarsal Head*

Introduction

Freiberg disease was first described by its namesake in 1914 as a pattern of infarction affecting the second metatarsal head (3). It is currently considered one of the four most common osteochondroses of the foot, although its etiology remains under discussion (3). The most common symptom is pain beneath the second metatarsal head, though it may also occur in other metatarsals. The condition is more frequently encountered in females, with a 5:1 female-to-male ratio, and is often seen in patients with an inverted metatarsal formula, where the second metatarsal is longer than the first. There is no reported preference for either foot, and the condition can be bilateral in up to 10% of cases (1).

In adolescents and in the early stages of the disease, orthopedic treatment is typically recommended. If conservative management fails, surgical intervention should be considered (1)(2).

Various surgical techniques have been described, but none has demonstrated clear superiority over the others in terms of clinical outcomes (1)(4).

Case Presentation

A 25-year-old female patient presented with a 3-month history of pain localized to the second metatarsal head of the right foot, which limited her ability to perform daily activities as a dancer. Radiographic and magnetic resonance imaging (Figures 1 and 2) revealed changes suggestive of avascular necrosis of the second metatarsal head, leading to the diagnosis. She had previously undergone orthopedic treatment without improvement.

Operative Technique

With the patient in the operating room, a dorsal approach was made over the second metatarsal head. The soft tissues were carefully dissected and protected to expose the metatarsal head. Resection was performed via an osteotomy at the neck level.

The resulting space was filled using a tendon allograft from the extensor hallucis longus, which was shaped into a shell form before being positioned (Figure 3). The graft was fixed to the volar plate in relation to the flexor tendon, with capsular repair to ensure stability. Additional fixation was provided using a 1.0 mm K-wire. The wound was closed using standard technique. Postoperative radiographic results are shown in Figure 4.

Follow-Up

The patient was seen two weeks postoperatively for removal of the initial dressing. At six weeks, the K-wire was removed, and physical therapy was initiated to restore movement and strength. By three months, the patient reported controlled pain and had resumed regular activities, progressively returning to her previous level of performance. At six months, she was pain-free and fully rehabilitated, capable of performing her daily tasks. At the five-year follow-up, the patient remained pain-free, actively dancing, and able to wear high heels for work without limitations.

Fig 1. *Changes in the head of the Second metatarsal.*

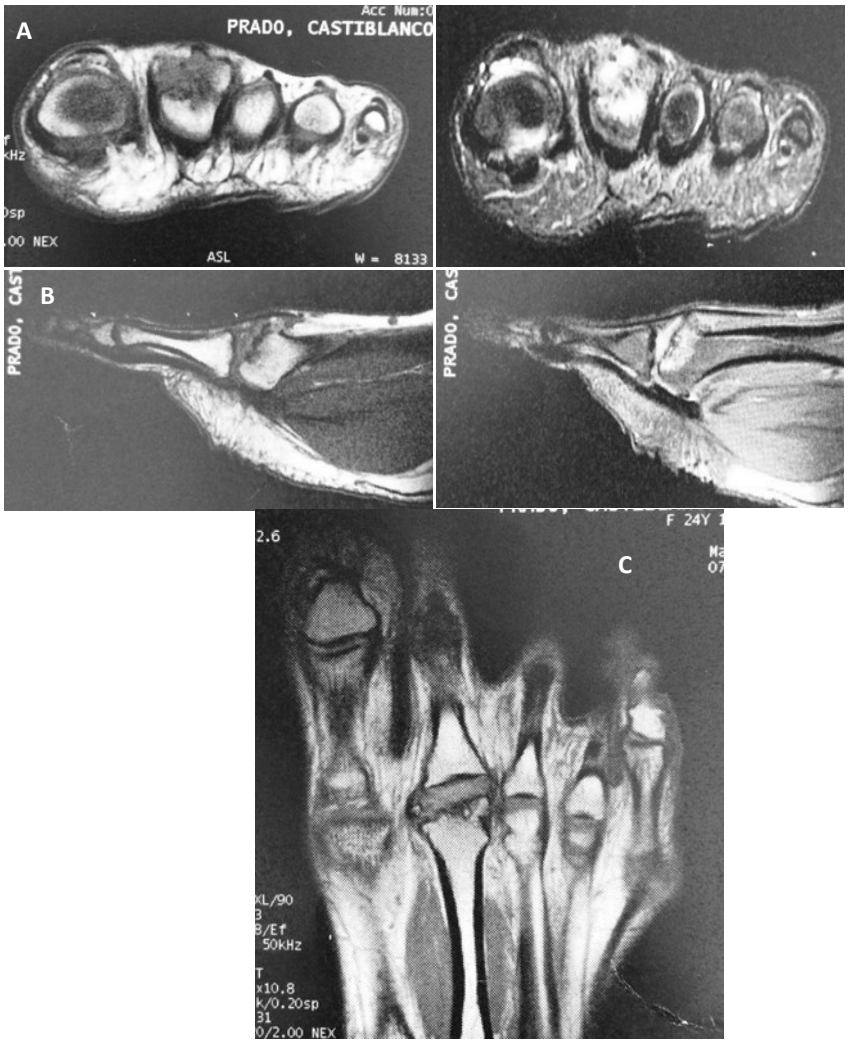

Fig 2. *MRI A, B, C*

Discussion

The various treatments described for Freiberg disease have not demonstrated clear superiority, making it difficult to recommend a definitive management approach. According to the stage of the disease, some treatment protocols have been proposed. Stage I involves a subchondral fracture; Stage II, central collapse; Stage III, flattening of the articular surface; Stage IV, separation of free fragments; and Stage V, destruction of the articular surface. (1-5)

Based on this staging, it is generally considered that adolescents and patients in the early stages of the disease should receive conservative orthopedic treatment. (4-7) In cases where this approach fails, or when patients present at a later stage, surgical intervention is usually necessary. (4)

Described surgical techniques include: metatarsal head osteotomy, resection of the proximal third of the phalanx, elevation of the depressed area, articular debridement, arthroplasty, and shortening osteotomies. (2-7)

In this study, we conducted a literature review using major databases and found no consensus on a superior treatment method. Therefore, we present a new technique for managing this condition, along with its outcomes over the first six months of follow-up.

Fig 3. *FHL graft – Shell shape*

Fig 4. *Final XR results*

Conclusion

Freiberg disease is an avascular necrosis of the metatarsal heads, typically affecting the second metatarsal. It causes pain and limitations in certain activities. While several treatment options have been described, there is no clear evidence supporting the superiority of any particular approach. In this article, we present an uncommon technique used in a young patient, which yielded good results.

Conflicts of Interest

The authors declare no conflicts of interest.

References

1. Al-Ashhab MEA, Kandel W a., Rizk AS. A simple surgical technique for treatment of Freiberg's disease. Foot [Internet]. 2013;23(1):29–33. Available from: http://dx.doi.org/10.1016/j.foot.2012.12.003
2. Carro LP, Golano P, Fariñas O, Cerezal L, Abad J. Arthroscopic Keller technique for Freiberg disease. Arthrosc - J Arthrosc Relat Surg. 2004;20(6):60–3.
3. Cerrato R a. Freiberg's Disease. Foot Ankle Clin [Internet]. 2011;16(4):647–58. Available from: http://dx.doi.org/10.1016/j.fcl.2011.08.008
4. Hayashi K, Ochi M, Uchio Y, Takao M, Kawasaki K, Yamagami N. A new surgical technique for treating bilateral Freiberg disease. Arthroscopy. 2002;18(6):660–4.
5. Helix-Giordanino M, Randier E, Frey S, Piclet B. Treatment of Freiberg's disease by Gauthier's dorsal cuneiform osteotomy: Retrospective study of 30 cases. Orthop Traumatol Surg Res [Internet]. 2015;101(6):S221–5. Available from: http://dx.doi.org/10.1016/j.otsr.2015.07.010

6. Ihedioha U, Sinha S, Campbell a. C. Surgery for symptomatic Freiberg's disease: Excision arthroplasty in eight patients. Foot. 2003;13:143–5.

7. Kilic A, Cepni KS, Aybar A, Polat H, May C, Parmaksizoglu AS. A comperative study between two different surgical techniques in the treatment of late-stage Freiberg's disease. Foot Ankle Surg [Internet]. 2013;19(4):234–8. Available from: http://dx.doi.org/10.1016/j.fas.2013.06.004

8. Lin S-Y, Cheng Y-M, Huang P-J. Freiberg's infraction-Treatment with metatarsal neck dorsal closing wedge osteotomy: report of two cases. Kaohsiung J Med Sci [Internet]. 2006;22(11):580–5. Available from: http://dx.doi.org/10.1016/S1607-551X(09)70356-0