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Case Report | Olgu Sunumu

A CASE WITH FOURTH DEGREE FREIBERG DISEASE

DÖRDÜNCÜ DERECE FREIBERG HASTALIĞI OLAN BİR OLGU

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ABSTRACT
A 17-year-old woman came to the orthopedic clinic with pain that started on the foot before a few months and reflected on the second and third metatarsals. Radiological examination revealed distortion of the second and third metatarsal heads and diagnosis of stage 4 of Freiberg's disease. The treatment was planned surgical. Stage IV is rare and we aimed to share the diagnosis and treatment effectiveness in this case.
Keywords*:* Anatomy, Freiberg disease, radiology

ÖZ
On yedi yaşında kadın hasta, birkaç ay önce ayak parmağında başlayan ve ikinci ve üçüncü metatarsallarına yansıyan ağrı şikayetiyle ortopedi kliniğine gelmiştir. Radyolojik incelemede ikinci ve üçüncü metatars başlarında bozulma saptandı ve Freiberg hastalığının 4. Evresi olarak tanı konuldu. Tedavi cerrahi olarak planlandı. Bu olguda, Evre IV nadir görüldüğü için tanı ve tedavi etkinliğini paylaşmayı amaçladık.
Anahtar Kelimeler: Anatomi, Freiberg hastalığı, radyoloji

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Introduction

Freiberg's disease that it occurred with the second metatarsal head ischemic necrosis was first described by Albert Freiberg in 1914. It has been rarely reported to affect the other metatarsals.[1-3] The incidence of this disease in the literature; It is in the head of the second metatarsal (68%), the third metatarsal (27%) and the fourth metatarsal (3%). It is rarely seen at the beginning of the fifth metatarsal.[4] Gauthier described the disease evolution in terms of five stages:

Stage 1: A fissure fracture in the ischemic epiphysis. The cancellous bone at the fracture appears sclerotic. When it was compared with the connected metaphysis, the epiphysis shows there is no blood supply. Treatment of stage 1, using metatarsal pad and low heel.[5]

Stage 2: The spongious bone absorption becomes proximally. The central cartilage dives the head while the margins and plantar cartilage remain intact. This procedure ends up a modified contour of the articular surface. Treatment of stage 2, stop sports, cheilectomy and debridement.[5]

Stage 3: There are much more absorption, and the central part embed deeper, occurring larger projections on either side. The plantar cartilage remains intact. Treatment of stage 3, du Vries arthroplasty or debridement phalanx or volar soft tissue interposition.[5]

Stage 4: The central part maintains to embed such that the plantar knuckle gives way. The peripheral projections fracture and fold over the central portion. Anatomic renovation is improbable. Treatment of stage 4, as stated for stage I, II and III.[5]

Stage 5: The final stage showing arthrosis with flattening and deformity of the metatarsal head. Only the plantar portion of the metatarsal cartilage. Treatment of stage 5, as noted for stage I, II and III.[5]

Case Report

A 17-year-old woman came to the orthopedic clinic with pain that started on the foot for a few months. She stated that her mobility was seriously restricted because of increased pain after a few meters of walking. The patient had no trauma history, no smoking, no previous medical history and no medication. On physical examination, sensitivity was observed. Radiological images proved distortion of the second and third metatarsal heads and stage 4 of Freiberg's disease was established a final diagnosis (Figure 1, 2) but the other foot was entirely normal.

Conservative treatment of Freiberg's disease is the best advise primarily, often employing the use of metatarsal supports.[6] The initially conservative treatment was appointed including of orthotic devices and modified shoes. However, conservative treatment was not successful. Then, the treatment was planned surgical as stage 4 Freiberg disease was seen. Dorsal closing-wedge osteotomy method was used in the case. The patient was operated on their backs in a tourniquet position. To reach the extensor tendon, a longitudinal incision was used on the dorsal surface of metatarsophalangeal joint. Then the extensor tendon was moved to the fibular side. The joint capsule was opened dorsally and the joint was debrided. After this operation, a dorsal closing-wedge osteotomy was applied to metatarsal head on the undamaged cartilage plantar surface was turned into dorsal. As a result, the adjustment between proximal phalanges and arthrosis has been preserved. In addition, two crossed kirshner pins were implanted to determine osteotomy. We asked the patient to come to the controls. AOFAS (American Orthopaedic Foot & Ankle Society) score was evaluated as 93 points out of 100 in the control.

Figure 1. Freiberg disease of the proximal phalanx, second digit closely

Figure 2. Backward view of Freiberg disease of the proximal phalanx, second digit

Discussion

Freiberg's disease is not a common disease. Although various reports have described Freiberg's disease since 1914, classification and treatment methods are not completely established.[4] Smillie classified the appearance of the metatarsal head in Freiberg's disease into five stages in 1957.[7] If Freiberg's disease is not treated properly, it can become a debilitating condition and arthritis at a young age. Immobilization is important in acute phase, but if conservative treatment fails, there are many surgical options to consider.

Hay et al. in 1995, examined the case who 60-year-old woman with Freiberg disease on both the second and third metatarsal heads on the same foot. Hay et al. initially

planned treatment as a conservative treatment, but ultimately decided on surgery. The proximal hemiphalangectomy of the heads of the second and third metatarsal was completely alleviated.[8]

Helix-Giordanino et al. examined 30 patients who the second metatarsal was affected in 27 cases and the third metatarsal in 3 cases and average age was 61.2 years. These patients underwent a Gauthier osteotomy procedure with two dorsal staples used for fixation. Patients were called for control 15 days, 45 days and 3 months later and evaluated patient satisfaction. AOFAS score, metatarsophalangeal range of motion (ROM), round of metatarsal head, ossification and metatarsal shortness factors were evaluated. Gauthier's osteotomy procedure has resulted in a successful clinical outcome.[9]

Çiloğlu et al. were examined sixteen patients with Freiberg disease (11 female, 5 male). Their articular surfaces were evaluated using direct roentgenogram and magnetic resonance imaging following the physical examination. They performed re-alignment of the joint surface with dorsal closed wedge osteotomy performed with joint debridement, maintaining the length of the metatarsal and reducing symptoms.[10]

Ikoma et al. conducted a study of 13 feet of 13 cases with average age 31.7 (range 13-72 years) with Freiberg's disease, where extra-articular dorsal closure wedge osteotomy was performed using a polyblend suture.[6]

Kim et al. studied 19 patients with average age 33.6 (17-62 years) who were surgically treated for Freiberg's disease and an average follow-up period of 71.6 months (41-121 months). They emphasize that the modified Weil osteotomy is a helpful method for the treatment of Freiberg's disease.[11]

Al-Ashhab et al. the average age is 18.3 years; They studied ten female patients (aged 14-24 years) treated with debridement, synovectomy, dorsal closing wedge osteotomy and pin fixation technique. This study included patients with the main symptoms, pain in walking or sports, their daily lives, and activities, those who did not recover with non-surgical treatment and had a history of trauma. They found that wedge osteotomy of the metatarsal head is presented as a reliable and good procedure regardless of the stage of the disease.[12]

Doğan et al. examined a 19-year-old woman who had a 3-month history of pain along the dorsal side of the right dorsum of foot and had a persistent foot pain that worsened while walking. On the x-ray of the right foot, subchondral sclerosis of the second metatarsal head was observed to be fragmented within the joint. Initially, the patient received anti-inflammatory drugs, activity modification and conservative treatment with a metatarsal pad. The symptoms disappeared after 2 months of conservative treatment.[13]

16 patients (11 female, 5 male) with average age 24.5 (range 13-49 years) years who underwent resection of the metatarsal head or dorsal closing wedge osteotomy were included in Özkul et al. study. Second metatarsal was affected in 13 patients and third metatarsal was affected in 3 patients. According to Smillie's classification system, ten patients had stage IV osteonecrosis and six patients had stage V. Post-surgical pain complaints of the patients ended.[14]

Stage IV with epiphyseal dysplasia of the metatarsal head is extremely unusual. Treatment planning should be done according to the stage of Freiberg's disease in each metatarsal head. In this case, we demonstrated that conservative treatment was insufficient in stage IV of Freiberg's disease, and the patient was relieved with surgical treatment. The patient was asked to come to the controls. The patient stated that pain upon walking and running improved and life comfort increased. As a result, dorsal closing-wedge osteotomy method used to treat Freiberg's disease was successful.

Compliance with Ethical Standards

Permission was granted for this report.

Conflict of Interest

The authors declare that there is no conflict of interest regarding the publication of this article.

Author Contribution

AGK, VTT, AHY: Concept; AGK, VTT, AHY: Design; AGK, VTT, AHY: Supervision; AGK, VTT, AHY: Resources; AGK, VTT, AHY: Materials; AGK, VTT, AHY: Data collection and/or processing; AGK, VTT, AHY: Analysis and/or interpretation; AGK, VTT, AHY: Literature search; AGK: Writing manuscript; AGK : Critical review.

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