

■ Case Report

An etiological searching for multiple displaced metatarsal stress fractures*Çoklu yer değiştirmiş metatarsal stres kırığının etiyolojik araştırması*Esra DEMIREL¹, Kadri YILDIZ*², Kenan CADIRCI³, Eyüp SENOCAK²¹Erzurum Training and Research Hospital, Department of Orthopedics and Traumatology, Erzurum²Palandoken State Hospital, Department of Orthopedics and Traumatology, Erzurum³Erzurum Training and Research Hospital, Department of Internal Medicine, Erzurum, TURKEY**ABSTRACT**

Metatarsal fracture that is improved by using low-dose cortico-steroid for a long time due to secondary osteoporosis reason by rheumatoid arthritis. 53 year-old female patient use low-dose cortico-steroid for 12 years due to Rheumatoid Arthritis. At the last clinic trials, multiple metatarsal fractures occurred before 3 months. Multiple metatarsal fractures were fixed by conservative treatment on the serial clinical trials for 3 months. In patients which have used corticosteroid, even if low-dose, fractures can be seen on the unusual bones.

Keywords: Secondary osteoporosis, multiple metatarsal fractures, corticosteroids, stress fractures

ÖZ

Romatoid artrit bağı olarak uzun süreli düşük doz kortikosteroidlerle yapılan tedavi sonucu gelişen sekonder osteoporozla oluşan çoklu metatarsal kırık sunulmaktadır. Elli üç yaşında kadın hasta 12 yıldır romatoid artrit nedeniyle düşük doz kortikosteroid kullanmaktadır. Son klinik kontrollerde yaklaşık 3 ay önce çoklu metatarsal kırıklar meydana gelmiştir. Yapılan 3 aylık seri poliklinik kontrollerinde hastanın çoklu metatars kırığı konservatif tedavi ile iyileşmiştir. Romatoid artritli hastalarda uzun süreli, düşük doz olsa bile, kortikosteroid kullanılan hastalarda, alışılmadık kemiklerde kırıklar açısından görülebilmektedir.

Anahtar kelimeler: Sekonder osteoporoz, çoklu metatarsal kırık, kortikosteroidler, stres kırığı

Introduction

Some multiple factors are effective on stress fractures of metatarsal bones. This type of fracture was seen occasionally on women, especially at the menopausal period due to bone resorption. Stress fractures occurred on sportive people, dancers by repetitive micro-traumas. Fracture type

is generally away from metatarsal basement at this type [1]. Generally, prodromal pain episodes during weeks are the point of discussion. Differential diagnosis is hard and important [2]. In rheumatological diseases have been observed in a rate of 0.8% of non-traumatic insufficiency fractures. The most common sites of insufficiency fractures are pelvis, sacrum, tibia, the sections

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near to the insertion of the fibula, calcaneus and buttocks. Generally, bone-joint involvement in rheumatic diseases and osteoporosis connected with prolonged use of corticosteroids prepares the ground for these insufficiency fractures [3].

In this paper, present the metatarsal fractures which we have identified in an unexpected localization in a patient the diagnosis of rheumatoid arthritis who has been secondary osteoporosis for a long time use of low-dose steroids were presented.

Case Report

53-year-old male patient admitted to orthopaedic policlinic because of the starting complaints pain and swelling in his left foot since 25 days. At the anamnesis, he has been diagnosed as Rheumatoid Arthritis approximately for 12 years. The patient was using low-dose corticosteroids without a break since approximately the last two years. In the verified surveys, performed in and was verified avascular necrosis of the talus and common arthritic changes depend on Rheumatoid Arthritis foot-ankle involvement, there were sensitiveness with palpation and swelling in the metatarsal region of the patient's examination. In radiography, it was seen the displaced of 2nd, 3rd, 4th metatarsal basis' and nondisplaced fracture line in his 5th metatarsal basis, but it was intact of Lisfranc joint (Figure 1).



Figure 1: The patient's AP, oblique and lateral X-ray image.

At the differential diagnosis, trauma was first searching progress; the patient's anamnesis was not compatible. Bone tumor or pathologic fracture due to malignancy was an other diagnostic parameter. But there was no malignancy or tumor on the clinical examination and laboratory outcomes of patient. And also, patient were not defining long-time walking. Patient have a unclear chronic minor trauma story just. Positive aspects for stress fractures at the patient were sedantary life-style, long-time walking story, Rheumatoid Arthritis and long-term corticosteroid use. Negative aspects were absence of any major trauma story and malignancy.

The patient's L1-L4 T-Score was found of -3.2. Patient have not received any treatment for osteoporosis. 25(OH)D levels was under 20 ng/ml (18.7).

Patient's corticosteroid drug were stopped immediately. And patient's low extremity were take in rest by cast and ambulation by walking were inhibited. The patient which treated of orthopedic aspects, was started Alendronate sodium 70 mg and 2800 IU Vitamin D₃ treatment.

Discussion

Stress fractures described in athletes and soldiers with an incidence of 5–30% [2]. At the clinical stress fracture there is a mismatch between the strength of the bone and the amount of mechanical stress. It is mainly found in weight-bearing bones such as the tibia, metatarsals, and calcaneus. Immobilization, joint deformities, and steroid treatment are associated with rheumatoid arthritis and are also known risk factors for fractures.

Stress fractures are classified into two type: insufficiency and fatigue fractures. Insufficiency fracture is a type of stress fracture which is the result of normal load on abnormal bone and is especially seen in osteoporosis. Common seen body regions are the vertebrae, tibia, the sacrum, and the femur. A fatigue fracture is a type of stress fracture that is the result of abnormal or chronic repetitive stresses on normal bone. The "march fractures" of the metatarsal bones are well known.

Stress fractures are well recognised complication in arthritic patients. Osteopenia (juxta-articular or generalised) caused by extensive rheumatoid involvement, corticosteroid treatment, or relative immobility is a predisposing factor. Deformations, flexion contractures and increased mobility after arthroplasties leading to increased stress on juxta-articular bone also contribute to this type of stress fractures. And also; stress fractures in rheumatoid arthritis (RA) preferentially affect the long bones of the legs, the neck of the femur, and the pelvis 2.

Symptoms of stress fractures included osteoporosis, bone pain, and insufficiency fractures, especially at the lower extremity. At the condition of drug stopping, pain of stress fractures reduced and the fracture healed. There is no evidence of loss of bone density is seen in patients with rheumatoid arthritis [8]. At the insufficiency fracture conventional radiographics may no demonstrate abnormalities. Magnetic resonance imaging or bone scintigraphy can prove the diagnosis. In the insufficiency fractures are more common in patients with joint diseases such as rheumatoid arthritis. If stress fracture of a long bone is suspected but not shown by plain radiology, either computerized tomography, magnetic resonance imaging or bone scintigraphy is recommended, depending on the medical community.

Stress fractures must be considered at the arthritic patients when there is pain in the foot, aggravated by weight. Symptoms caused by stress fractures, especially of the lower extremity, should be discriminated from active synovitis.

The clinical aspects of pain, aggravated by weight, in the leg should lead to a consideration of stress fractures. If the radiographic x-ray studies do not provide a diagnosis an adequate diagnostic procedure should be applied. Although ^{99m}Tc bone scintigraphy is sensitive for bone disorders which correlate with increased osteoblast activity. But this procedure is not specific for this condition. Both computed tomography and magnetic resonance imaging (in later stages of the disease) can provide a definite diagnosis 2.

The frequency of osteoporosis in patients with rheumatoid arthritis ranges from 4 to 24% and the frequency of osteopenia ranges from 28 to 61.9%. Glucocorticoid use was associated with decreased bone mass in 56.2% of subjects with RA. The rate of non-union was 7-28% even though immobilization treatment for 6 or 8 weeks. O'Malley, Hamilton, Muniak, DeFranco described metatarsal stress fractures on the 51 ballets.

There are multiple risk factors for insufficiency fractures. The pain had an acute onset after a minimal trauma. The patient had been immobile for a week because of the pain. Reduced mobility increases the risk of insufficiency fractures. It is described that chronic use of low-dose corticosteroids can also negatively affect the bone metabolism and increase the risk of fractures[10]. Rheumatoid arthritis can cause local and systemic osteoporosis and abnormal bone turnover[11]. Corticosteroids are possible risk factors for insufficiency fractures in patients with rheumatoid arthritis, although a causal link between corticosteroid and insufficiency fractures is debatable. Osteopathy due to corticosteroids should be considered. Withdrawal of the drug may be the best option in case of a proven fracture for stress fractures.

On the other hand, Dequeker and friends reported a study in which a cumulative, dose dependent, cortical bone loss at the radius in patients with rheumatoid arthritis treated with low dose methotrexate was found[12]. One must be careful to attribute this positive effect to the discontinuation of the drug, as fracture healing is dependent on multiple factors.

Corticosteroids are drugs of first choice in the treatment of inflammatory joint disorders such as rheumatoid arthritis and psoriatic arthritis. The drug may be responsible for insufficiency fractures in rheumatoid arthritis because of low bone turnover due to osteoblast inhibition. Its role remains debatable due to multiple risk factors for fractures, such as disease activity,

immobilization, or corticosteroid use. Stop corticosteroids therapy is advisable to enhance fracture healing.

Declaration of conflicting interests

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