

Bilateral Distal Tibial Stress Fracture in a Triathlete

Oboustranná únavová zlomenina distální tibie u triatlonisty

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SUMMARY

Stress fractures are common injuries in athletes. They result from excessive, repetitive loads on the normal bone which can cause an imbalance between bone resorption and formation, because during periods of intense exercise, bone formation lags behind bone resorption. The most common locations for stress fractures are weight-bearing bones of the lower extremities. This kind of injuries can easily be missed because they usually do not follow an acute injury in a fit young athlete, and plain radiographs usually appear normal.

In this paper, a case of an amateur triathlete who suffered from a bilateral distal tibial stress fracture is presented.

Key words: stress fracture, tibia, bilateral, distal tibia.

INTRODUCTION

Stress fractures result from excessive, repetitive loads on the bone, which can cause an imbalance between bone resorption and formation. An abrupt increase in the duration, intensity, or frequency of physical activity without adequate periods of rest may lead to an escalation in osteoclast activity. During periods of intense exercise, bone formation lags behind bone resorption. The exact mechanical phenomenon responsible for initiating stress fractures remains unclear. Another factor that can also cause stress fractures is physiologic stress on bones weakened by metabolic disease (2, 4).

Stress fractures are common injuries presenting in athletes. The incidence in general population is estimated to be a little less than 1%, while it can be as high as 15% in runners (6).

The most common locations for stress fractures are weight-bearing bones of the lower extremities: tibia, tarsal, metatarsal bones and fibula (3, 7). Even though a tibial stress fracture is one of the most common locations, the development of bilateral stress fracture is relatively uncommon (11).

In our case, we present an unusual case of a 40-year-old triathlete who was examined at the emergency traumatology clinic due to pain in both distal tibias which appeared simultaneously after running.

CASE REPORT

A 40-year-old man was seen at the emergency traumatology clinic complaining of bilateral ankle pain which started simultaneously during running. There was no history of trauma. After running he was able to walk,

but symptoms were worse with weight bearing. He was an otherwise healthy and fit amateur triathlete. A clinical examination revealed bilateral ankle swelling, which was slightly larger on the left side, and pain to palpation along both medial malleoli. The range of motion was reduced in both ankle joints.

We performed anteroposterior and lateral X-rays of both ankles which appeared normal (Fig. 1).

According to the clinical examination and X-rays, the patient was sent home with a prescription for an oral nonsteroidal anti-inflammatory drug and with the diagnosis of muscle sprain.

After fifteen days he was again seen at the emergency traumatology clinic still complaining of bilateral ankle pain, simple analgesia did not help. Both medial malleoli were swollen and painful on palpation, more on the left side. He was able to fully weight bear on the right lower extremity and partially weight bear on the left lower extremity.

We repeated the X-rays which now showed bilateral tibial stress fractures (Fig. 2). Laboratory reports did not show any abnormalities. Below-knee backslab for left lower extremity was applied, the patient got low molecular weight heparin protection, crutches, and instruction not to weight bear on the left side and partially weight bear on the right lower extremity.

Regular follow-ups at the outpatient clinic every two weeks were performed. The patient was pain-free. After five weeks below the knee back slab was removed and additional X-rays were performed. The fracture of the right tibia was healed and callus formation was seen in the left tibia (Fig. 3).



Fig. 1. AP and lateral X-rays appeared normal.



Fig. 2. Repeated X-rays showed bilateral tibial stress fractures.



Fig. 3. X-rays after 5 weeks.



Fig. 4. X-rays after 17 weeks, fractures were healed.

In the meantime, a measurement of bone density was performed which showed osteopenia. We prescribed vitamin D supplements. The patient's symptoms resolved and function has returned to normal after seventeen weeks. Fractures were healed (Fig. 4). He was pain-free, able to fully weight bear and also run.

DISCUSSION

The pathogenesis of stress fractures is multifactorial. Several factors such as female gender, low vitamin D levels, alcoholism, cigarette smoking, high levels of parathormone, low bone density, lower lean and higher fat mass, body mass index, foot anomalies, etc. play a role in this pathology (1, 10, 15). We can distinguish from fatigue stress fractures (abnormal load on normal bone) and insufficiency stress fractures (normal load on abnormal or osteopenic bone) (8). It is important to have a high level of suspicion of a stress fracture when we check on a patient who presents with bone pain after an intense physical training or after new/unusual activity (9, 13). Early X-rays of a stress injury can be initially completely normal therefore more specific and sensitive diagnostics must be performed. Bone scintigraphy is highly sensitive, but has the potential for false positive. However, MRI provides high sensitivity and specificity in stress fractures and also benefits of being able to evaluate the surrounding soft tissues (5, 8, 14). One important point in stress fractures is that it can also be seen in elderly and the mechanism is the same as in younger patients. However, the poor bone quality reduces the entity of the stimulus necessary to produce fracture and low energy trauma is often enough (12).

In conclusion, sudden pain after physical activity with no history of trauma and normal X-ray images should be a trigger for considering a stress fracture and further diagnostics (MRI). In our case we did not suspect a stress fracture and that is why further imaging was not performed. If MRI imaging would have been done at the first visit of the patient and the correct diagnosis

established, the therapy would stay conservative but the patient would probably be able to full weight bear without pain a few weeks earlier. Even though stress fractures are usually treated with offloading of the injured limb, analgetics, and some short-term immobilization, they should be diagnosed properly and in some cases also treated surgically.

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