Title : Stress Fractures of the Foot and Ankle in Athletes, an Overview

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Introduction-

Stress fractures occur due to repetitive forces on the bones and develop over time. The etiology differs from a traumatic fracture and therefore stress fractures are more an overload injury. Stress fractures of the foot and ankle are frequently seen in athletes and can be a potentially career ending injury for these high demanding sportsmen. Some locations are considered as high-risk stress fractures due to slow healing and high rates of non-unions. This article discusses the most common sites for stress fractures of the foot and ankle, the risks and evidence on best treatment options.

A stress fracture develops over time and is the result of an overload of the bone. Therefore these fractures are also called fatigue fractures. The etiology differs from traumatic fractures, because the damage is caused when repeated forces on the bone outruns its remodelling capacity. This can eventually result in micro-fractures leading to a weak spot and when loading proceeds, a stress fracture can arise. Another difference with a traumatic fracture is the stress fracture's healing process. It is described that stress fractures do not heal by callus formation, but more via direct remodelling of bone across the fracture line. This is a slower process and more comparable to the healing pathways of non-unions.

Athletes belong to a very healthy but also demanding group of patients. They require much of their body with intensive workloads. They are at risk to create an overload injury, and studies reported an incidence of stress fractures among athletes of up to about 2% Different sites of the foot and ankle can be affected and in some, union problems and re-fractures are frequent and are considered high-risk. This article focusses on the most common sites of stress fractures in the foot and ankle, discussing the epidemiology, diagnostic options, risks and best available treatment.
Patients' history usually concerns prodromal symptoms, with insidious onset. These symptoms have a chronic character sometimes worsening gradually. In other cases pain eventually worsens after an acute moment of severe pain. People suddenly increasing their training intensity and athletes of adolescent' age ,are at risk to develop a stress fracture. Furthermore intrinsic factors like nutrition or hormonal deviations, both frequently seen in especially endurance athletes, and sex have been suggested to contribute to the misbalance of bone remodelling resulting in a stress fracture, although in conflicting directions.

Treatment-

Conservative treatment is an option if the athlete can manage the pain while performing activities and is able to go on despite of it. According to the biology of a stress fracture, a possible theory would be that when continuing performing sports a total fracture could occur.

This means: a fracture more like a traumatic fracture and thus with more potential to heal. It is important to consider the anatomical variations and locations, to classify the fracture into low- or high risk Another possible important factor to be at high risk of healing problems is the hypovascularity of the affected bone. Stress fractures localized in a hypovascular site or a so-called watershed area, are considered to be of a high-risk When untreated, healing problems could occur due to the lack of vascularization at these spots.

Conclusion-

Stress fractures in the foot and ankle are common injuries in athletes. They can be classified as overuse injuries, and often seen in the younger athletes or military recruits. In order to prevent this type of injury, trainings intensity should be deliberated, which is hard to achieve in professional athletes. When low-risk stress fractures are still in early stage, it is an option to continue sports if the athlete can stand the pain during activities. High-risk stress fractures can develop more easily into a chronic problem, with career-ending properties. It is necessary to pay attention to diagnose these fractures in an early state and treat these more aggressive..