

Stress Fracture



Small Crack in a Bone *A stress fracture is a minute crack in a bone, usually located in a lower limb, that is caused by a change in the force load on that limb. Most stress fractures occur after an increase in repetitive trauma on a weight-bearing bone in the lower leg or foot. Stress fractures are commonly seen in runners, tennis players, gymnasts, dancers, and basketball players. Stress fractures in athletes may result from an increase in the amount or intensity of an activity; they also may be caused by increased surface impact due to loss of cushioning in the shoe or playing surface.*

The primary symptom of stress fracture is local pain at the fracture site that is relieved by rest. Diagnosis is made by taking a history of recent activity and a symptom history. In some cases, imaging studies are used to confirm the diagnosis.

The most effective treatment for stress fractures is rest. The fracture site must be protected from activity for a minimum of 6 to 8 weeks to permit complete healing. During this period, the patient can perform alternative exercises to remain active. In some cases, shoe inserts or braces can help immobilize and support the area and enhance the healing process. The recommended rest period must be maintained for the full duration; early or continued activity involving the injured limb can lead to complications that may require orthopedic surgery. Once a stress fracture is completely healed, a regimen of flexibility, strength training, and variation in fitness activities is typically recommended to prevent the development of stress fractures in the future.

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The Most Common Cause of Injury Is Running

Although stress fractures—tiny cracks in the bone—are an occupational hazard for professional athletes, they can develop in anyone who is beginning a new activity or has weakened bones from osteoporosis or a poor diet. These fractures most often occur in the lower limbs and feet, but they can develop in the spine and ribs (in sports such as gymnastics) and in the bones of the upper body (in sports causing repetitive movement in that area, such as tennis).



Stress fractures are most common in the weight-bearing bones of the lower leg and foot, although they can occur elsewhere.

Causes, Symptoms, and Diagnosis

The most common cause of stress fractures is running, which leads to repetitive stress on the bones of the leg and foot. When the weight load is greater than the bone's ability to handle this stress, small cracks can appear in the bone. This is especially true when there is a change in the amount or intensity of the activity or in the cushioning of the shoe or surface used for the activity.

Women may be more susceptible to stress fractures because of weaker bone mass. The “female athlete triad”—a condition that includes an eating disorder such as anorexia, irregular or no menstrual periods, and osteoporosis—can predispose women to stress fractures.

The primary symptom of a stress fracture is the gradual onset of pain during a particular activity. The pain increases as the activity continues and is relieved by rest. With each exercise session, the pain may begin earlier in the workout. There may be tenderness at the point of fracture, with possible redness and swelling.

Often, the diagnosis is made by evaluating the history of the pain in relation to activity, as well as any changes in the amount or intensity of the activity or playing surface. These tiny cracks in the bone cannot be seen on a typical x-ray image, especially soon after the fracture occurs. If needed, another imaging procedure, such as a computed tomography scan or magnetic resonance imaging, may be used to confirm the diagnosis.

Treatment and Prevention

The treatment of stress fractures involves a rest period from the activity that likely caused the fracture. Depending upon the location of the fracture, healing can be facilitated by stabilizing the bone with a brace or shoe insert. Other forms of activity, such as swimming and cycling, may be performed. Ice compresses may be used to reduce swelling. Acetaminophen or nonsteroidal anti-inflammatory drugs are useful initially to relieve pain, but the pain is best relieved with rest.

Most stress fractures heal completely with appropriate treatment. If activity is resumed too early, inadequate healing or re-injury can occur. These complications can lead to chronic pain and bone weakness, so it is important never to ignore stress fractures by continuing the activity that caused the problem.

It is especially important to correct any element that may have been involved in causing the stress fracture. This includes not only limiting weight-bearing activity on the affected bone, but also using proper shoes and athletic surfaces. Any factor that could contribute to weakened bone, such as osteoporosis, should be treated if it was present when the fracture occurred.

Stress fractures can be prevented by slowly building up time and intensity level in any athletic activity. Appropriate supportive athletic shoes, as well as the right playing surface, should be used. A diet that promotes strong bones is another important means of prevention. Any activity that causes pain should be discontinued until it can be performed without discomfort.