LAKESIDE
SPORTS MEDICINE CENTRE

Metatarsal stress fracture

A metatarsal stress fracture is an overuse injury, in which stress develops in the bone and leads to an incomplete fracture. There are five metatarsal bones each of which is located in the forefoot.
Pictured below is an Xray of the foot, with a stress fracture in the 3rd metatarsal (long bone of the foot).

Several muscles attach to the metatarsal bones. When these muscles contract, a pulling force is exerted on the respective bones. Furthermore, weight-bearing activity such as running and jumping place high load through the metatarsals. With repetitive impact/loading, bony damage can gradually occur. This initially results in a bony stress reaction, however, with continued damage this may progress to a metatarsal stress fracture. Of the metatarsals, the second metatarsal (next to the big toe) is most commonly affected.

What causes a stress fracture?

A stress fracture of the metatarsal typically occurs over time with excessive weight bearing activity such as running, sprinting, jumping or dancing. They often occur following a recent increase in activity or change in training conditions.

Signs and symptoms of a metatarsal stress fracture

Typically the athlete experiences pain at the top of the foot that increases with impact activity such as running, dancing or standing on toes. Occasionally, the athlete may notice redness and swelling at the stress fracture site. In more severe cases, walking may be enough to aggravate symptoms and patients may experience

pain with rest. Other symptoms may include night pain, pins and needles, pain and pain with firmly touching the affected metatarsal bone. Diagnosis is generally made on these signs and symptoms, with an X-ray, MRI, CT scan, or bone scan, which can confirm diagnosis and determine the severity of injury. Often the fracture will be missed on early Xray, so further investigation may be needed.

Treatment

Treatment for a stress fracture of the metatarsal typically involves an initial period of 4 – 8 weeks rest from weight bearing activity with crutches, or a CAM walker/boot. Following this, a gradual increase in weight bearing activity and exercise can usually occur as tolerated, provided symptoms do not increase. This should take place over a period of weeks to months with direction from your physio. During this time, pain free non weight bearing activities can help to maintain fitness, such as swimming, water running and cycling with a light load in the saddle . Return to running must be gradual, and softer surface are best. The athlete will usually start with a walk-run program, and only on alternate days initially.

Contributing factors to the development of a metatarsal stress fracture

There are several factors that may contribute to the development of this condition. These need to be assessed and corrected with the help of your health professional.

- poor foot posture (especially flat feet)
- muscle weakness (particularly calves, glutes and hip control muscles)
- poor flexibility, particularly ankle joint stiffness, calves
- inappropriate footwear (especially high heels or tight shoes)
- inadequate diet (lack of calcium/ vit D)
- inappropriate or excessive training (particularly on hard or uneven surfaces)

Physiotherapy for a metatarsal stress fracture

Physiotherapy treatment for patients with this condition can be helpful to hasten healing, but most valuable in guiding return to activity and preventing injury recurrence.