

FIFTH METATARSAL FRACTURES

INTRODUCTION

Fifth metatarsal fractures are often the result of a twisting injury to the foot and ankle. The metatarsal will fracture, instead of the joint dislocating, due to strong ligaments that secure the proximal portion of the bone to the adjacent metatarsal and tarsal bones. There are three different zones where fractures can occur, and treatment is tailored according to the location of the fracture. Regardless of the location of the fracture, patients experience pain along the outer border of the foot, along with swelling and bruising.

ANATOMY

The proximal fifth metatarsal is divided into zones. Fracture healing is dependent upon good blood supply at the fracture site.

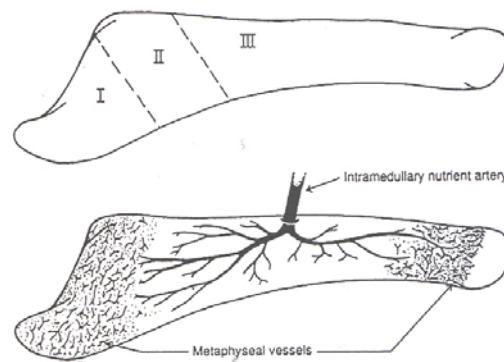
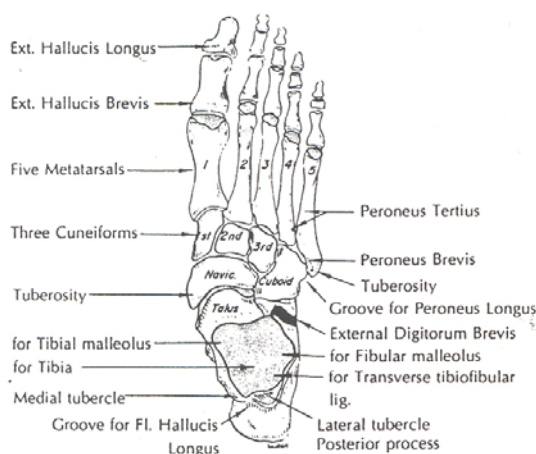


Fig. 1 Top, The three anatomic zones at the base of the fifth metatarsal: zone 1 includes the articular surface of the fifth metatarsocuboid joint; zone 2 encompasses the articulation of the proximal fourth and fifth metatarsals; zone 3 extends 1.5 cm distal to zone 2. Bottom, The arterial blood supply of the fifth metatarsal. The intramedullary nutrient vessel enters the medial aspect of the fifth metatarsal in the middle third of the bone. It divides into shorter proximal and longer distal branches. There are multiple minute vessels in both the proximal and distal metaphyses. There is little collateral circulation to the nutrient vessel at the junction of the diaphysis and the metaphysis proximally.

Zone 1 Fractures - these are usually avulsion fractures that result when the foot twists inward and the tendons along the outer ankle contract to prevent further twisting force to the forefoot. These fractures heal with little difficulty, as this area of the bone has an excellent blood supply.

Zone 2 Fractures - also have a similar mechanism of injury, but are complicated by the fact that the blood supply to the bone is usually disrupted by a fracture at this level. Consequently, healing may be delayed or a non-union may occur. Fractures at this level are called **Jones Fractures**.

Zone 3 Fractures - tend to be stress fractures that are caused by repeated inward force at the most distal end of the bone. The strong ligaments at the base of the fifth metatarsal cause this force to be transferred to the shaft of the bone, eventually resulting in a fracture through the outer cortex of the bone. Fractures can also occur more distally in Zone 3,

along the metatarsal shaft, from a sudden, twisting force. These fractures are often long, oblique fragments that can take a considerable amount of time to heal.

TREATMENT

Avulsion fractures in Zone 1 can be treated symptomatically with a compressive dressing or a stiff shoe. Patients may resume activities as tolerated. Non-unions generally require no treatment, unless there is pain, in which case the fragment can be surgically excised.

Zone 2 fractures, which are true Jones fractures, are best treated with cast immobilization until there is evidence of healing on x-ray. There is some controversy as to whether or not patients should be allowed to weight-bear in the cast during the first weeks of treatment. Patients are casted for a period of 4 - 6 weeks. If non-union does occur, surgical fixation is recommended.

Proximal Zone 3 fractures are fairly stable due to the strong ligament attachments with adjacent bones, and may be treated with limited activities, a stiff shoe, or a cast. Casting of these injuries may shorten the healing time. Fractures that extend more distally along the shaft of the metatarsal are often painful enough to require a period of casting. Surgical fixation is also an option for either of these fractures should non-union occur.