

# Sesamoiditis

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## Summary

Pain on the bottom of the foot at the base of the great toe is characteristic of sesamoiditis. Symptoms usually originate from excessive, repetitive loading to this area of the foot. Often patients will have a higher arched foot. Treatment involves avoiding activities that aggravate symptoms; inserts that offload the involved area, comfortable supportive shoes, anti-inflammatory medications if tolerated, and possibly corticosteroid injections. Patience is required as it often takes time to successfully manage the symptoms of sesamoiditis.

## Clinical Presentation

Sesamoiditis is characterized by pain on the bottom of the foot along the base of the great toe. Sesamoiditis is a general term for painful inflammatory symptoms associated with either one or both of the sesamoid bones, which are located beneath the first metatarsal head as it forms part of the great toe. Symptoms can originate from a variety of pathologies, but discomfort is usually associated with excessive loading of this area of the foot. Patients who present with this problem will often have a history of some recent event or series of events which resulted in increased stress and overload to the area. They often describe a recent increase in repetitive weight-bearing activities, a sudden change in shoe wear, or an increased exercise or training regimen. A major acute traumatic event is a much less common cause for the problem. Usually these patients have unwittingly subjected themselves to gradually increased or changed activity levels. Pain from this area is usually described as sharp and severe at times, and most patients can pinpoint the location with one finger (ie, the sesamoid itself). The discomfort they experience often leads to a restriction of activities, changes in shoe wear, and possibly even a limp. Patients will often find it uncomfortable to walk with barefeet or on hard surfaces. The actual symptoms can stem from a variety of causes, including: local overload of the soft-tissues in this area with resulting chronic tissue injury, stress fracture of one of the sesamoids or a sesamoid which never heals (nonunion) after injury, and cartilage damage (arthritis) between the sesamoid and the first metatarsal head. Another common injury to the great toe area is a “turf toe” injury, which is usually identified after acute trauma, and can also present with pain on the bottom of the ball of the foot beneath the big toe.

## Physical Examination

The most common forms of sesamoiditis, by far, present with a slow, steady onset of patterned pain beneath an otherwise normal looking big toe, which is worse with weightbearing and better with offloading activity. Patients can almost always point right to the site of discomfort, which is directly beneath one, or both, of the sesamoids. These structures sit on the inside (medial) and outside (lateral) part of the base of the great toe (1st metatarsophalangeal joint, beneath the 1st metatarsal head) — which these bones are designed to support. Patients are typically tender to palpation directly beneath one or both of the sesamoids.

It is also common for patients who suffer from sesamoiditis to have high arched feet, since this type of foot predisposes to this problem by concentrating excess load underneath the great toe, along the ball of the foot. Range of motion of the great toe is often normal, although there may be pain at the extremes of motion, particularly when the toe is bent upwards (dorsiflexed), because this puts axial strain on the tissues that attach to the sesamoids below. Marked loss of motion of the big toe, or pain on the top of the great toe is more consistent with a diagnosis of hallux rigidus and progressive arthritis.

## Imaging Studies

Plain x-rays of the foot are always indicated to both help diagnose this problem, as well as rule out other potential problems in this region of the foot. They permit proper assessment of the entire forefoot region, and, in particular, are designed to look at the two sesamoids and how they sit anatomically beneath the great toe joint (1st metatarsophalangeal joint). Fractures, subluxations, dislocations, osteochondrosis, or avascular necrosis affecting the sesamoid(s) can usually be diagnosed on these plain x-rays. Sometimes people are born with sesamoids that are naturally in several pieces, called bipartite (two pieces) or multipartite (many pieces) sesamoids. While the normal sesamoid is a singular roundish bone the size of a pea, these types almost look like the bone has been broken. They are simply a normal variant, however, and need to be carefully distinguished from true fractures. Bipartite or multipartite sesamoids are common and, while they can cause pain in certain circumstances, they are usually asymptomatic. The best way to make this diagnosis is to get x-rays of the opposite side, since bipartite sesamoids are often bilateral whereas a true fracture is usually not.

When an accurate diagnosis cannot be made, an MRI or even a CT scan can usually accurately differentiate between these various pathologies. MRI is probably the most preferred test, but both can be very helpful and may need to be ordered in order to assess whether there is evidence of joint damage (ex. arthritis) in the great toe, a capsular injury (turf toe), an area of dead bone (avascular disease or osteochondrosis), or a stress fracture of one of the sesamoids.

## Treatment

Management first requires ensuring that the symptoms are not caused by an acute sesamoid fracture, nonunion of a fracture, or by a turf toe injury. These conditions are usually treated differently and respond differently to care. In some cases, sesamoiditis can be a chronic, aggravating condition that is recalcitrant to treatment. Fortunately, most cases can be effectively treated with various forms of offloading and inflammation control. In addition to offloading, other treatments include modifying activities in the short-term to decrease repetitive injury to the sesamoids, and possibly taking anti-inflammatory medication or icing to improve symptoms. Specific treatments include:

- **Activity modification:** Symptoms are often precipitated by an increase in activity level, a change in footwear, or a change in impact activity – anything that serves to increase the force and/or repetition of loading to that area of the foot. Stopping any precipitating activity (stress) is a key first step to managing the symptoms of sesamoiditis. Decreasing activity level or modifying activities to dramatically decrease the loading to this area of the foot is an important short-term solution to allow the chronically injured tissue in the foot to have a chance to heal. After symptoms have settled and other treatments have been instituted, activity level can often (but not always) be very gradually resumed.
- **Off-loading shoe inserts:** A shoe insert designed to cushion and offload the area under the base of the great toe can be very helpful. This can be done by either using a cushioning insert and adding a “Dancer’s” or “metatarsal” pad to take load away from the involved area, or by using a customized or over the counter prefabricated orthotic with a recessed area under the base of the great toe, so that this area is taking less force with each step than it normally does.
- **Comfortable, well padded, supportive shoe wear:** Shoes that disperse forces evenly away from the front of the foot can be helpful. Typically shoes with a stiff but supportive sole and a slight rolling curve to the sole (rocker-bottom contour) will be helpful. It is important to combine any rocker sole with a soft or contoured insert/orthotic, however, as the use of simply a stiff sole alone can actually aggravate symptoms.
- **Anti-Inflammatory Medications (NSAIDs):** In patients who do not have any contraindication, the use of anti-inflammatory medications may help provide excellent short-term pain

relief. It is important to realize that NSAIDs address the pain response, but often do not address the underlying reason leading to the pain (repetitive localized loading)

- Injection Therapy or Surgery: Occasionally, when the aforementioned treatment strategies fail, patients can be considered as potential candidates for a steroid injection. This, however, should not be considered as part of the standard or typically necessary treatment regimen for this problem, and should be reserved for extremely recalcitrant cases.
- Surgery: In rare instances, excision of the chronically inflamed sesamoid might be considered after all non-operative treatments have been exhausted. Excision of only one of the sesamoids should be considered. In addition, various forms of surgery to offload the sesamoid can also be considered in extenuating circumstances, especially in patients who present with anatomical mechanical overload as a result of high arched feet. However, surgery remains a rare requirement to treat the majority of these patients.

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