

## Sever's Disease – Calcaneal Apophysitis

In order to fully understand the mechanics of Sever's disease, it is important to first know a little about bone growth. To put it simply, at birth, the skeletal structure of the body is composed of cartilage. As a child grows, bone slowly replaces this cartilage until there is no more cartilage left to replace. This process is called ossification.

Ossification begins in the center of the bone, and works its way out to the extremities. Soon after, the ends also start to develop bone. These two areas of developing bone will therefore have a strip of cartilage between them, referred to as the growth plate. It is the growth plate that allows the bone to grow in size. Slowly, as bone grows from each direction, the growth plate will thin out, and eventually disappear. When this occurs, the bone has fully grown.

Sever's disease, or calcaneal epophysitis is an inflammatory condition of the growth plate in your calcaneus, or heel bone. It is the most common cause of heel pain amongst children, generally affecting active young males aged between 10 and 14. When children in this age group partake in activities such as running and jumping, the Achilles tendon can pull on the heel bone where it attaches. This aggravates the growth plate, resulting in pain and inflammation in this area.

In most cases, this pain is experienced on one side only, and isolated to the back of the heel, where the Achilles tendon attaches. The affected area is usually sensitive to touch and pressure.

Although sufferers can often walk pain-free, actions such as running and jumping will often illicit pain. Depending on the severity of the condition, there may or may not be swelling or redness over this area. Since Sever's disease is an inflammatory condition, the most effective diagnostic tool is a bone scan, which will detect any increase in blood flow in the region where the Achilles tendon meets the heel bone.

### **Treatment?**

The primary objective of treatment is to limit the stretch of the Achilles tendon, thereby reducing the tension exerted by it on the calcaneus.

Therefore, the most conservative approach to treating this pathology would be to limit activities such as jumping, tiptoeing and heavy running. Given the high activity levels of children this age, this is very difficult to achieve, therefore very rarely is this the only action taken.

From an orthotic perspective, there are a number of treatment options.

A heel raise of approximately 1cm would place the foot in a slightly plantarflexed position, thereby allowing the inflammation to subside while still allowing the child to partake in play activities. The heel raise could be incorporated within a pair of foot orthoses, or on the shoe itself.

In some instances, Sever's disease may arise as a result of an excessively pronated foot, which tends to increase Achilles tendon tension. If this is the case, foot orthoses with sufficient arch support should be provided to restore the medial longitudinal arch, and reduce the pull of the Achilles tendon on the calcaneus.

In addition to orthotic treatment, a series of Achilles tendon stretching exercises may also be prescribed, provided that this does not aggravate the condition.

Regular icing can also be implemented to relieve inflammation and pain, however this method of treatment does not target the biomechanical cause for this pathology, and is rarely the only method of treatment prescribed.

In more serious cases, movement of the ankle may need to be arrested completely. This can be achieved through the use of a short leg walking cast. This is a plaster or fiberglass cast that extends from just below the knee, across the ankle joint, and finishes just behind the balls of the foot. The foot is casted in a position of slight plantarflexion to ease the tension off the Achilles tendon.

The removable alternative to the short leg walking cast is the CAM walker, which allows the leg to be cleaned during the course of treatment. The ability to remove this device however may be a disadvantage if the patient is non-compliant to treatment.

When a case of Sever's disease is severe enough to require either of these two treatment methods, the child may be required to wear them for 2-6 weeks. Anti-inflammatories may also be prescribed for severe cases.

Regardless of the severity of this condition, Sever's disease is self-limiting, meaning that over time it will resolve itself. This usually occurs around the age of 16, when the calcaneus is close to fully grown, and the growth plate disappears. For this reason, the orthotist can safely reassure the mother of the child that this condition is not long-term, and is only a matter of time until it subsides completely.

