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TiOS
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Heel Pain in Children (Severs Disease: Calcaneal apophysitis)

Children's heel pain can be similar but more often tends to be different from adult heel pain. Of those children who do get heel pain, by far the most common cause is a disturbance to the growing area at the back of the heel bone (calcaneus) where the strong achilles tendon attaches. This is known as Sever's disease or calcaneal apophysitis (inflammation of the "cartilage" growth plate) and is considered a type of "osteochondroses". Sever's disease is one of several different 'osteochondroses' that occur in the body, an example of osteochondroses at the front and below the knee cap is called Osgood-Schlatters Disease.

Sever's disease is generally seen in the 7 to 14 year old age group. In children many of the bones are still made of cartilage and starting to convert into bone. The heel (calcaneus) has one large area of bone development (ossification center) that starts in the center and another thin and smaller area of bone development that occurs at the back of the heel bone. As growth occurs there is a remaining **strip of cartilage** between the two areas of developed bone in the calcaneus. At around age 16, when growth is nearly complete, these two bony areas fuse together as the cartilage strip converts to bone as well and forms the one piece adult heel bone. Sever's disease or calcaneal apophysitis is usually considered to be due to stress, inflammation, damage or a disturbance in this strip of cartilage during growth of the heel bone.

Symptoms of heel pain (Severs disease or Calcaneal apophysitis):

Pain is usually felt at the back and side of the heel bone. Sometimes there may be pain at the bottom of the heel. The pain is usually relieved when the child is not active and becomes painful with activity such as soccer. Squeezing the sides of the heel bone is often painful. Running and jumping make the symptoms worse. One or both heels can be affected. In more severe cases, the child may be limping.

Causes of heel pain (Severs disease or Calcaneal apophysitis):

The causes of Sever's disease are not clear. It is believed to be due to overuse phenomenon or repeated minor trauma that may occur with impact loading seen in sporting activities. The cartilage remaining between the two developing bony areas of the heel may be subjected to tensile and shear stresses which leads to injury. It appears that some children are more prone to developing sever's disease. In addition playing on hard surfaces, poor footwear, suboptimal stretching/strengthening, and growth spurts may contribute to developing sever's disease.

It can be an epidemic at the start of sports seasons, especially in winter when the grounds are often harder or summers where the grounds are under-watered. Children who are heavier may also be at a greater risk for developing calcaneal apophysitis. A tight calf muscle is also common in those who develop calcaneal apophysitis because of the pull exerted by the tendon on cartilage strip at the back of the heel. A pronated foot (a foot rolled in at the ankle) is also more common - it is assumed that this may cause an uneven weight bearing on the back part of the heel bone.

Treatment heel pain in the child:

- Reduce sporting activities – you don't have to stop, just reduce the amount until symptoms improve. Sometimes a complete rest is needed.
- Avoid prolonged unnecessary standing/walking, especially barefoot on hard surfaces.
- Consider a short term use of a soft cushioning heel gel raise. This will raise the heel and effectively reduces the pull from the calf muscles on the growth plate and decrease shear stresses to the growth plate.
- Increase Calf flexibility with stretches and strength with exercises as this reduces the pull stress generated by the calf on the heel.
- Encourage the use of ice packs, preferably ice baths after activity for upto 15- 20 mins. This can be repeated 2 to 3 times a day and reduces inflammation in the area of pain.

If pain persists, an orthopedic evaluation is recommended.

- It is important to rule out other uncommon causes of heel pain. Your orthopedic surgeon may recommend xrays.
- Sometimes specialized foot orthotics may be prescribed.
- Strapping or taping may sometimes be used during activity to limit the ankle joint range of motion. In addition
- Anti-inflammatory medication may be prescribed to reduce inflammation.
- Sometimes a walking boot or cast may be used to rest and minimize stress to the injured area.

Prevention of Severs disease:

After the calcaneal apophysitis resolves, prevention with the use of good supportive shock absorbing shoes as well as calf stretching and strengthening with heel raises are important to prevent it from happening again.

Long term consequences of heel pain (Severs disease or Calcaneal apophysitis):

Severs Disease is often self-limiting, it will go away when the child completes the growth cycle. In very few cases, the child will have to be removed from all sporting activities due to the level of pain and loss of function. However, most children with Severs will continue to participate in their sporting endeavors with modifications that allow for pain-free participation.

Amir M. Khan M.D.

Dr Khan is the founder of the Texas Institute of Orthopedic Surgery and Sports Medicine, PLLC (TiOS). He is a Board Certified Orthopedic Surgeon and an arthroscopy and sports medicine expert. He has vast experience in the care of the high level athlete at both the professional and amateur levels including: NFL Football-San Francisco 49er's (1999- to 2006), XFL Football-San Francisco Demons, The X-games at San Francisco, San Jose Ballet, Stanford University and Santa Clara University athletics including men & womens championship soccer teams, and several NCAA Division-I tournaments including Basketball, Soccer, and Volleyball. Dr Khan has played soccer internationally and is a former NCAA div-I soccer player and LISFL (Long Island-NY) club soccer player.

You can learn more about Dr Khan on the TiOS website: www.TiOSonline.net or at the American Academy of Orthopedic Surgeons website: <http://orthodoc.aaos.org/AmirMKhanMD/>
