Sever's Disease

Synonyms: calcaneal apophysitis

Sever's disease is a term used to describe inflammation of the calcaneal apophysis which occurs in children and adolescents. Sever first described the condition in 1912. Further studies have suggested that the condition is due to repeated ‘microtrauma’ at the site of the attachment of the Achilles tendon to the apophysis of the heel, often as a result of sporting activities.

The disorder can be classified among the general osteochondrosis syndromes such as Osgood-Schlatter disease.  

**Epidemiology**  
Sever's disease is the most common cause of heel pain in children and adolescents, usually occurring between 8 and 14 years of age.  

In one prospective study of injuries among players aged 9-19 years in football academies, 2% of overall football injuries were due to Sever's disease; the peak for incidence was in the under-11 age group.

**Aetiology**  
The line of ossification in the calcaneal apophysis is thought to develop microfractures due to recurrent stresses on the heel, combined with the growth spurt of puberty. As in similar conditions (eg, Osgood-Schlatter disease), it is believed to be caused by decreased resistance to shear stress at the bone-growth plate interface.

**Presentation**  
Heel pain, usually in young physically active individuals, which is:

- Gradual in onset and worse on exercise, especially running or jumping.
- Relieved by rest.
- Often bilateral.

Ask specifically about:

- The nature of the pain.
- Aggravating or relieving factors.
- History of trauma.
- Physical activities - sports, dance, etc:
  - How often do you train?
  - How often do you compete?
  - At what level?

- Type of shoes normally worn.
- Any other medical conditions or medications.

On examination, the typical signs are:

- Tenderness on palpation of the heel - particularly on deep palpation at the Achilles tendon insertion.
- Pain on dorsiflexion of the ankle - particularly when doing active toe raises; forced dorsiflexion of the ankle is also uncomfortable.
- Swelling of the heel - usually mild.
- Calcaneal enlargement - in long-standing cases.

Carefully examine the whole foot and ankle because Sever's disease may be associated with other foot abnormalities such as flat feet or high arches.

**Differential diagnosis**

- Achilles tendonitis.
- Plantar fasciitis.
- Calcaneal heel spur.
- Calcaneal fracture or stress fracture.
- Calcaneal periostitis.
Investigations

The diagnosis is clinical and investigations are not routinely required.\textsuperscript{[5]} However, investigation to look for other causes is suggested if:

- Pain is persistent or significant at rest.
- Pain disturbs sleep.
- There is significant swelling.
- There is reduction of subtalar movement (suggests tarsal coalition).

Possible tests:

- X-ray of the heel may show increased sclerosis and fragmentation of the calcaneal apophysis - but these features are nonspecific and it may be normal.\textsuperscript{[2]} The value of X-ray is to exclude fracture or a rare tumour. The diagnosis is clinical, not radiological.\textsuperscript{[1, 6]}
- One small study suggests that ultrasound may be useful.\textsuperscript{[7]}
- CT or MRI scan may be useful to exclude osteomyelitis or fusion of the small bones of the hindfoot. It is not always required.

Management\textsuperscript{[1, 8]}

Treatment options include a combination of stretching, strengthening exercises, limiting physical activity and sports participation, ice, heel lifts for removal of tensile forces on the calcaneus, correction of malalignment through orthotic use, and anti-inflammatory drugs. However, there is no strong evidence for any specific form of treatment.\textsuperscript{[9]}

The aims are to reduce trauma to the heel, allow rest/recovery and prevent recurrence. Most cases are successfully treated using:

- Physiotherapy and exercises - eg, to stretch the gastrocnemius-soleus complex; to mobilise the ankle mortise, subtalar joint and medial foot.\textsuperscript{[1]}
- Soft orthotics or heel cups.
- Advice on suitable athletic footwear.

Other modes of treatment are:

- In severe cases: temporarily limiting activity such as running and jumping.
- Ice and non-steroidal anti-inflammatory drugs (NSAIDs), which can reduce pain.
- In very severe cases, a short period of immobilisation (eg, 2-3 weeks in a cast in mild equinus position) has been suggested.

In general, management is along the normal lines for sports injuries. Explain to the child and parent that this is an overuse injury, common in the growing child. It has a good prognosis but it is necessary to ease back on any sports training for a while to let it recover. During abstinence from normal training, cardiovascular fitness can be maintained by non-weight-bearing exercise such as swimming or cycling.

Prognosis

The condition is normally self-limiting and a return to normal sports activities is usually possible within two months.\textsuperscript{[8, 9]} However, the condition may recur.

Further reading & references

- Sever's Disease/Calcaneal Apophysitis; Wheeless' Textbook of Orthopaedics