

SEVER'S DISEASE (WHAT DO WE REALLY KNOW?)

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INTRODUCTION

Calcaneal apophysitis (Sever's Disease) is a condition we frequently encounter. The condition was originally described in 1907 by Haglund, although Sever is most often credited with description of the condition. When considering writing an article on this topic, my initial goal was to review the literature in an attempt to report which forms of treatment were most effective. This was surprisingly difficult, as there are no prospective studies comparing various forms of treatment.

DEFINITION

Sever's disease is generally defined as inflammation of the secondary growth center in the calcaneus (apophysis). However, there are some authors that question the existence of Sever's disease, at least as most practitioners generally understand the condition. Ferguson and Gingrich doubt the existence of the condition because of a lack of swelling in the area of pain. Brower, stated that conditions such as plantar fasciitis, retro-calcaneal exostosis, or Achilles tendinitis most likely were the source of the pain. Ogden doubts the involvement of the apophysis based on magnetic resonance imaging (MRI) studies performed before and after treatment. He noted signal changes in the metaphyseal

associated with well as apophyseal area in symptomatic patients that were unresponsive to conservative treatment. The patients were then treated with cast immobilization or a foot orthosis. Post-treatment MRIs were then performed. Improvement in symptoms showed correlation with decreased signal intensity in the metaphyseal area of the calcaneus. However, there was no change in MRI signal intensity in the calcaneal apophyseal region pre- versus post-treatment. Therefore, he concludes that the pain most likely originates from micro fractures of the metaphysis not the apophysis. The following 2 images are taken from Ogden's article for illustrative purposes (Figure 1).

PRESENTATION

Calcaneal apophysitis affects children while bony growth is occurring at the calcaneal epiphysis. It is most commonly reported to occur between the ages of 7 and 15 years in boys and 5 and 13 years in girls. The secondary ossification center generally appears at age 5-7 in girls, and 8 in boys. The epiphysis closes at around age 13 in girls and 15 in boys. In both groups, the average age for presentation is around 11 years of age. The apophysis itself has its own growth centers separate from the large calcaneal apophysis (Figure 2).

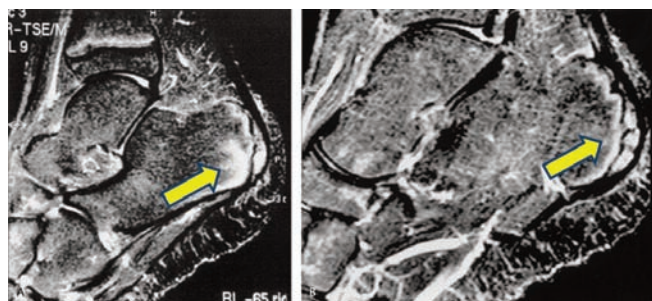


Figure 1. On the left is a 12-year-old male, diagnosed with Sever's disease. The arrow points out an area of increased signal intensity in the metaphyseal portion of the calcaneus. The image on the right, is after 3 weeks in an ankle-foot orthosis followed by 7 weeks of activities as tolerated but without resuming sports. The authors point out decreased signal intensity in the metaphyseal region of the calcaneus after treatment, but less obvious change in the apophyseal region.

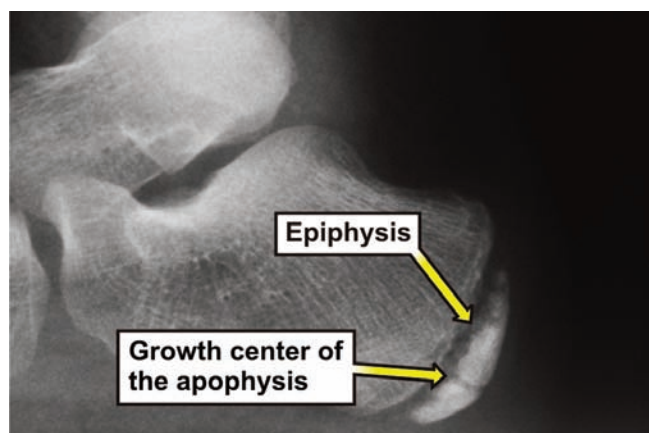


Figure 2. The Achilles tendon as well as the plantar fascia attach to the apophysis.

INCIDENCE

The incidence of calcaneal apophysitis is generally reported to comprise between 2-16% of all musculoskeletal complaints in children. However, the articles that reference these percentages tend to be retrospective studies that often utilized multiple examiners. Frequently, the techniques of making the diagnosis of calcaneal apophysitis are not stated and therefore the confidence that the source of heel pain was in fact Sever's disease is less certain. Also, many studies were done at specialty sports medicine clinics and therefore were not necessarily representative of the condition as it affects a more general pediatric population.

ETIOLOGY

Various conditions have been reported as being causative conditions in the development of calcaneal apophysitis. The predominant theory as to the cause of the condition suggests that inflammation occurs at the epiphysis due to repetitive micro-trauma produced by excessive traction by the Achilles tendon and plantar fascia. A commonly cited predisposing condition for developing calcaneal apophysitis is excessive tightness of the Achilles tendon. Dozens of articles report that growth spurts, where bony elongation is occurring, leads to relative excessive Achilles tendon tightness. However, there is no proof that this assertion is true. There have been no prospective studies to support the contention. Authors that do report the correlation don't clearly mention by what method this finding is measured, and when they do (such as a visual scale) there is no certainty that the method is reproducibly accurate.

Biomechanical abnormalities such as increased pronation are also often reported. However, the authors do not clearly report by what method they measured pronation, and what criteria justified the label of having increased pronation. Furthermore, no study has been performed to compare degrees of pronation in patients with calcaneal apophysitis versus an asymptomatic control group. Ogden reported that the condition is more likely a stress fracture process of the metaphysis. Although an interesting contention, further study is needed.

DIAGNOSIS

We tend to think of making the diagnosis of calcaneal apophysitis on the basis of the patient's history and clinical examination findings. Pain is typically produced on medial to lateral compression along the calcaneal growth plate. Radiographs are often taken, but primarily to rule out other conditions that might cause heel pain such as bone

tumors, epiphyseal avulsion fractures, etc. However, upon review of the literature, there are some authors that have proposed that the diagnosis can be made radiographically.

However, it is more commonly accepted that radiographs are unreliable to make the diagnosis, and that the symptomatic apophysis on average shows no more sclerosis or fragmentation than the asymptomatic extremity. There have been some retrospective studies showing greater degrees of fragmentation, but because of the study design, the accuracy of the original diagnosis of calcaneal apophysitis was called into question.

TREATMENT

There are many forms of treatment that are commonly reported. Most forms of recommended treatment are copied from author to author, with almost no testing of these various modalities in an effort to demonstrate superiority of one form of treatment over another. Therefore, at this point there is no agreed upon "best treatment." The following is the typical list of recommended treatments:

1. Decreased or cessation of sports activities
2. Stretching exercises
3. Heel lifts
4. Visco-elastic heel cups
5. Orthotics
6. Immobilization with and without weight bearing
7. Ice
8. Nonsteroidal anti-inflammatory drugs

Orthotics are recommended to address various biomechanical abnormalities, but as earlier stated, there is no conclusive evidence that biomechanical abnormalities (even if present) actually cause or contribute to the condition.

SUMMARY

We have reviewed some of the accepted ideas about calcaneal apophysitis. However, the evidence is for the most part based on opinion and retrospective studies. It does not mean the ideas are untrue, just unproven. It is interesting that since the recorded history of the condition, there have been very few prospective studies. There is an abundance of articles making many assertions, but most of these "statements of fact" can not be supported.

Furthermore, common agreement on the assertion makes little difference, as much of the agreement may be based on the same unfounded opinions. Over time, these assertions become accepted as fact. An unfortunate aspect of medical literature is the frequency of opinions given without coupling the statements with the level of certainty of the assertion. Otherwise, how is the reader to know

whether the statement is well supported, or just repeated dogma? In addition, it is all too common to follow up on a referenced statement made in a medical journal only to find the “fact” was merely taken from another article. As time goes on the hearsay adds up, and opinions get accepted as facts.

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