Treatment for Calcaneal Apophysitis

KATHERINE UVELLI, MD, and JON O. NEHER, MD, *Valley Medical Center, Renton, Washington*
SARAH SAFRANEK, MLIS, *University of Washington Health Sciences Library, Seattle, Washington*

Clinical Question

What are effective therapies for calcaneal apophysitis (Sever disease)?

Evidence-Based Answer

Several treatments for calcaneal apophysitis may produce modest short-term improvements in pain scores. Heel inserts and prefabricated orthotics may initially improve pain scores and dysfunction, but patients have equal improvement by three months with or without therapy. (Strength of Recommendation: B, based on a comparison study and secondary outcomes of an unblinded randomized controlled trial.)

Evidence Summary

A clinical trial comparing the effectiveness of inserts and footwear for persons with calcaneal apophysitis found that two inserts were associated with improved pain scores.[1] The study included 124 children eight to 14 years of age with a clinical diagnosis of calcaneal apophysitis who were recruited from health clinics in Melbourne, Australia. Patients were randomized to one of four treatments: two types of shoe orthoses (heel inserts made of shock-absorbing ethylene vinyl acetate or prefabricated polyurethane orthotics) and two types of footwear (current footwear vs. new athletic shoes). The patients were followed for 12 months. The primary outcome was disability and pain as measured by the 24-point physical domain portion of the validated Oxford Ankle Foot Questionnaire for Children, which assesses pain, soreness, and leg fatigue while standing and during activity throughout the day. Scores improved for all patients by approximately 15% (absolute) at one month and by 30% at two months. Patients using heel inserts had statistically significant ($P = .04$) but clinically unimportant (3%) improvement at one and two months compared with those using orthotics, regardless of footwear. Footwear changes produced no difference. Scores did not improve in any group after two months.

One research team published three small trials on treatments for calcaneal apophysitis that showed modest short-term improvements in heel pain.[2-4] The first compared two types of inserts in 33 athletes nine to 14 years of age.[2] Patients were randomized to use a firm plastic heel cup with a brim or a 5-mm cork heel wedge for four weeks. Pain was measured during activity using a 10-point visual analog scale (0 = no pain, 10 = maximal pain) for two weeks before treatment, during treatment, and two weeks after treatment. A control group of five patients 10 to 13 years of age had pain scores measured before and after seven to eight weeks of no treatment. During the trial, patients were active at least three times per week in their two most painful sports (most commonly soccer and running). Patients using inserts had decreased heel pain during treatment; mean soccer and running pain scores changed from 4.0 and 4.5, respectively, to 2 ($P < .001$), then returned to near-pretreatment levels after treatment (3.0 and 3.5, respectively). Mean pain scores for those in the control group decreased from 7 to 6.

A follow-up crossover study (n = 44) comparing the same heel cup and wedge used in the previous study found that the heel cup was more effective in reducing pain scores.[3] Patients were randomized to the heel cup or wedge for four weeks, followed by a two-week washout period. They then crossed over to the other treatment. The study used the same 10-point pain scale used in the previous study. After four weeks, the heel

cup was associated with more pain relief during activity (odds ratio = 0.22; 95% confidence interval, 0.15 to 0.34). When patients were offered their choice of treatment, the heel cup was preferred (77% vs. 23% for the cork wedge).

In the third trial, 35 athletes nine to 14 years of age were randomized to a heel cup or no treatment.[4] Pain scores were measured during activity at baseline and at four weeks using a 10-point pain visual analog scale. Baseline scores immediately dropped from 7 to 2 for those who used the heel cup but did not change for the children receiving no treatment. After four weeks, those who used the heel cup reported pain scores of 3 (in shoes alone) and 0.5 (with the heel cup), whereas untreated children had scores of 5. The study was limited by lack of statistical comparison, and pain was a secondary outcome.

Another randomized controlled trial of 101 patients eight to 15 years of age who had calcaneal apophysitis found no differences at 10 weeks in examiner-induced pain with pressure measured using a standardized scale. Patients were randomized to one of three treatments: a wait-and-see protocol (avoiding painful activities), use of shock-absorbing heel inserts (without activity limitation), and physical therapy focusing on eccentric calf-strengthening exercises.[5] At three months, there was no difference in patient satisfaction and scores on the Oxford Ankle Foot Questionnaire for Children (physical domain, activity restriction, emotional distress, and footwear choices) assessed by patients and their parents.

Address correspondence to Katherine Uvelli, MD, at kuvelli@gmail.com. Reprints are not available from the authors.

Author disclosure: No relevant financial affiliations.

REFERENCES

1. James AM, Williams CM, Haines TP. Effectiveness of footwear and foot orthoses for calcaneal apophysitis: a 12-month factorial randomised trial. *Br J Sports Med*. 2016;50(20):1268-1275.
2. Perhamre S, Janson S, Norlin R, Klässbo M. Sever's injury: treatment with insoles provides effective pain relief. *Scand J Med Sci Sports*. 2011;21(6):819-823.
3. Perhamre S, Lundin F, Norlin R, Klässbo M. Sever's injury; treat it with a heel cup: a randomized, crossover study with two insole alternatives. *Scand J Med Sci Sports*. 2011;21(6):e42-e47.
4. Perhamre S, Lundin F, Klässbo M, Norlin R. A heel cup improves the function of the heel pad in Sever's injury: effects on heel pad thickness, peak pressure and pain. *Scand J Med Sci Sports*. 2012;22(4):516-522.
5. Wiegerinck JI, Zwiers R, Sierevelt IN, van Weert HC, van Dijk CN, Struijs PA. Treatment of calcaneal apophysitis: wait and see versus orthotic device versus physical therapy: a pragmatic therapeutic randomized clinical trial. *J Pediatr Orthop*. 2016;36(2):152-157. ■