Eccentric Training Rivals Achilles Tendon Brace

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A pneumatic brace was as effective as eccentric training in resolving chronic Achilles tendon pain in a study that randomized 100 patients.

The investigators hypothesized that the brace, a device known as the AirHeel, probably does work to help resolve tendinopathy, and that perhaps combining the AirHeel brace with eccentric training—one of the more common treatments for chronic Achilles tendon pain—could yield a synergistic effect.

Instead, they found that both the brace and the training were only moderately beneficial and that the combination was a only a little better than either the brace or training alone (Am. J. Sports Med. 2007;35:1659-67).

The investigators randomized 37 patients to eccentric, calf-muscle training, 35 patients to the brace, and 28 patients to both. Some patients had pain in both Achilles tendons.

Patients who were randomized to use the brace wore it for 12 weeks.

The AirHeel brace has two interconnected air bladders. One fits under the heel and the other just above the calcaneus. As a person walks in the brace, pressure alternates between the two bladders, applying pulsating compression to reduce swelling and discomfort, and massaging the areas to enhance circulation.

The massaging may help to move away metabolites, such as glutamate or lactate, or it may help break down adhesions between the tendon, the paratenon, and the surrounding tissue. But, the mechanism has never been studied, Dr. Wolf Petersen of the department of orthopedics at the University of Muenster (Germany) and his associates said.

Likewise, several mechanisms have been suggested for the effect of eccentric training. It may enhance collagen fibril alignment, or it may rid the aggravated area of neovascularization. Nevertheless, several studies have demonstrated that eccentric exercises improve pain and function, the authors noted.

Patients randomized to exercise were told to stand on the forefoot of the injured leg, with the ankle in plantar flexion, on a step or other elevation, and then lower down slowly. They were to exercise three times daily for 12 weeks, performing three sets of 15 repetitions, with the knee straight and the knee bent.

The patients in the brace-only treatment group were instructed not to perform strengthening exercises on their own.

The patient groups were all similar in age (a mean of 42 years), body mass index (a mean of about 25 kg/m^2), and duration of symptoms (a mean of 7 months). A total of 92 of the 100 patients were active in sports, and 60 were men.

A total of 87 of the patients previously had been advised to rest the affected leg, and most had received other treatments as well, generally nonsteroidal anti-inflammatory drugs.

Of the 100 patients enrolled, 86 patients completed the active, treatment phase of the study, and 72 patients completed the 1-year follow-up. Patients dropped out of the study for a variety of reasons, including patients who found training painful and patients who found the brace too uncomfortable. One patient in the brace group and one patient in the training group had surgery after completing their assigned treatment.

At 54 weeks, 90% of the remaining patients reported returning to their preinjury sports activity level.

Pain during daily activities, as measured by the visual analogue scale, was reduced from pretreatment by 20% in the eccentric-training group at 6 weeks, by 41% in the brace-only group, and by 22% in the combination group. But, by week 12, there was no further reduction in pain in the AirHeel group, while the eccentric-training group had further improvement, to a 60% reduction, and the combination group had further improvement, to a 56% reduction.

At the 1-year follow-up, pain still was reduced by 30% in the eccentric-training group, 27% in the brace-only group, and 53% in the combination group.

Pain during sports at 1 year was reduced 51% in the training group, 47% in the brace-only group, and 74% in the combination group.

The braces were supplied for the study by the company (Aircast, Vista, Calif.). Dr. Petersen and his associates disclosed receiving funds for research from Aircast Europe. ■