Achilles Tendinopathy in Diabetes Mellitus

Reference:

Scientific Literature Reviews

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Podiatric Relevance:
This study confirms that structural abnormalities within the Achilles tendon of diabetic individuals represents biologic changes affecting the inherent stiffness that leads to increased forefoot pressure and the development of plantar forefoot ulcers.

Methods:
Seventy consecutive diabetic patients (41 females, 29 males, mean age of 67 years) receiving ongoing care in a diabetic foot clinic underwent ultrasound investigation of their Achilles tendons. All patients were diabetic based on the criteria of the American Diabetes Association. Patients were excluded if they had previously undergone a lower extremity amputation, had a positive Thompson test indicating gastrocnemius-soleus motor unit incompetency, or had a previous history or current diabetic foot condition. Ultrasound investigations were performed with a 12-MHz transducer by the same examiner. Patients were positioned prone with the Achilles tendon being positioned parallel to the examination table. Both Achilles tendons were scanned in both the longitudinal and transverse planes. Criteria for defining structural disorganization and calcification were in accord with accepted published standard from the radiology literature. Fiber calcification and disorder were analyzed considering the change in ultrasound images, when there was some alteration on one side. The Student’s t-test was utilized for quantitative analysis.

Results:
Sixty-two subjects demonstrated ultrasound evidence of disorganization of the Achilles tendon fibers. Seventeen demonstrated calcification. Patients with calcification within the Achilles tendon had a twelve-year history of disease while those without had a ten year history of disease. Patients with calcification of the Achilles tendon had higher glycosylated hemoglobin than those without calcification.

Conclusions:
The results of this investigation provide strong supportive evidence for structural abnormality within the Achilles tendons of diabetic individuals. Further investigations will need to address the role of passive stretching or therapeutic accommodation, and how those activities can address the known abnormal loading patterns observed in the diabetic patient population.