

Achilles Tendinitis as a Cause of Neuropathy and Drop Foot, which Resulted in Gait Disturbances

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Achilles tendinitis commonly occurs in runners due to overuse of the tendon. Sometimes it may be caused by inflammatory diseases like rheumatoid arthritis and psoriasis or by medications such as steroids and fluoroquinolones. It has never been mentioned in association with gait disturbances caused by abnormal foot pronation and standing due to radicular neuropathy. We reported a case of Achilles tendinitis that developed in a patient with spinal stenosis, radicular injury, and accompanying drop foot.

Achilles tendinitis is inflammation of the tissue that connects the calf muscle to the heel. Inflammation is the body's response to injury or disease. Achilles tendinitis is a common condition in athletes, especially runners [1,2]. Running causes calf muscle contractions, which help to extend the toes. Sometimes it causes extensive pronation. Over time, this repetitive motion, combined with not giving your body enough time to rest, can cause painful inflammation [3,4]. Diseases related to Achilles tendinitis include rheumatoid arthritis, psoriatic

arthritis, and medication usage such as fluoroquinolones and steroids [5]. It can sometimes be associated with vasculopathy and neovascularization and can occur in the tendon because of a regeneration process or in response to chronic injury. Other gait abnormalities of different causes may cause abnormal nonphysiological foot position during walking. It may cause severe persistent tension pressure and damage the Achilles tendon due to repeated stress and strain, which is likely the cause of persistent damage injury.

Achilles tendinitis may cause neuropathic pain, as identified by the PainDETECT questionnaire, and may be common in patients with chronic lower limb tendinopathy. It is unclear whether patients with tendinopathy who have neuropathic pain may have poorer outcomes [4].

Described neurologic etiology will help the medical community understand relevant biomechanical mechanisms

PATIENT DESCRIPTION

A 67-year-old patient was referred to an orthopedic outpatient clinic due to 2 months of significant pain in the posterior lower part of the right tibia. Pain level was 7 according to the PainDETECT questionnaire.

Two years prior, the patient developed right sciatica and right drop foot, in addition to lower back pain, which improved with conservative treatment (walking stick and foot cast).

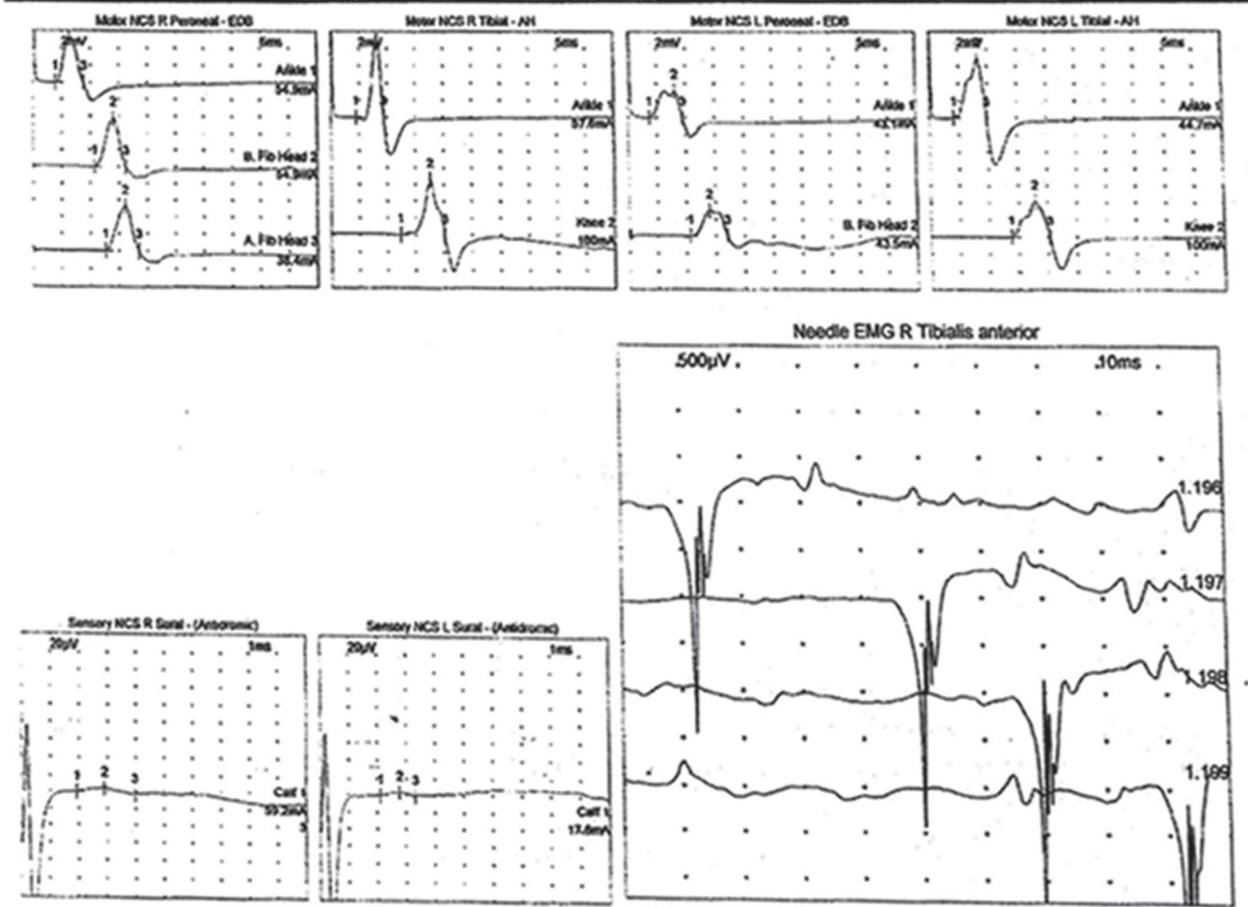
Physical examination revealed right partial drop foot, weakness of the tibial muscles, and significant reduction of gastrocnemius muscle mass. The difference between the two legs was 3.5 cm. The drop foot and neuropathic gait were associated with pronation of the right foot.

The right Achilles tendon was painful on palpation, warm, and without redness. Extension and flexion of the foot were severely painful. The patient did not complain of characteristic crunching sound during foot movement, which in principle excludes the paratenonitis.

There was no systemic temperature. Ultrasound of the Achilles tendon showed tendon swelling and thickened 1.6 cm with fluid around it with a disrupted, disorganized internal fibrillar picture pattern (hypoechoic), indicating inflammation or tendinosis, with new neovascularization. No calcifications or fluid was found in the surrounding bursa. There were no calcifications and no fluid within the paratenon (paratenonitis). No signs of partial tendon rupture were seen.

Figure 1. Electromyography of the right tibia was consistent with signs of right radicular injury (L4-S1) and signs of acute denervation scattered in the L3-5 area and in the following muscles: gastrocnemius, tibialis anterior, vastus medialis, and rectus femoris (right)

EMG Summary Table			Spontaneous			MUAP			Recruitment
Muscle	Nerve	Roots	IA	Fib	Fasc	Amp	Dur.	PPP	Pattern
R. Tibialis anterior	Deep peroneal (Fibular)	L4-L5	2+	2+	None	2+	2+	2+	Reduced
R. Gastrocnemius (Medial head)	Tibial	S1-S2	2+	2+	None	1+	1+	1+	Reduced
R. Vastus medialis	Femoral	L2-L4	N	None	None	N	N	N	N
R. Rectus femoris	Femoral	L2-L4	N	None	None	2+	2+	2+	Reduced
R. Gluteus medius	Superior gluteal	L4-S1	N	None	None	N	N	N	N
L. Tibialis anterior	Deep peroneal (Fibular)	L4-L5	N	None	None	1+	1+	1+	Reduced
L. Gastrocnemius (Lateral head)	Tibial	S1-S2	N	None	None	N	N	N	N
L. Vastus medialis	Femoral	L2-L4	N	None	None	2+	2+	2+	Reduced



A diagnosis of new Achilles tendinitis was made, and proper conservative treatment was started. Non-steroidal anti-inflammatory medication was prescribed along with a foothold together with a walking cast as a treatment for drop foot. The patient performed neuromuscular physiotherapy.

Electromyography and nerve conduction of the right tibia was consistent with signs of right radicular injury (L4-S1) and acute denervation scattered in the L3-5 area and in the right gastrocnemius, tibialis anterior, vastus medialis, and rectus femoris muscles [Figure 1].

Recurrent magnetic resonance imaging of the lumbar region showed spondylolisthesis of L4-L5, which caused spinal stenosis and pressure from the herniated disc in L3-5 on the nerve roots, with no changes observed over the last 2 years. The dural sac was narrowed and caused stenosis at the L4-5 level. The recommendation for laminectomy was initially denied by the patient at this time. He recovered from Achilles tendinitis over 7 months and then was referred for laminectomy.

COMMENT

Neuropathic gait can cause Achilles tendinitis, which may complicate the condition and worsen the treatment. Achilles tendinopathy is accompanied by symptoms such as swelling, discoloration, changes in consistency, vascularization, and nodules. The condition may also cause an increase in the concentration of neurotransmitters such as glutamate, which

causes pain and influences gait (hyperexcitability of pain-transmitting neurons), potentially leading to a neuropathic gait [2-4].

We reported on a case of Achilles tendinitis that developed in a patient who presented with radicular injury caused by spinal stenosis, which leading to drop foot, gait changes, and excessive pronation of the foot (over 5 degrees) in the subtalar joint. This type of mechanical mechanism can lead to tendinitis [3,4]. A similar mechanism can be seen in drop foot, where the deviation of the foot due to abnormal standing and deviation of the tendon axis can cause stretching and rupture of the fibers [2-5].

Our case adds to the current understanding of the mechanical pathways through which neuropathy and altered gait biomechanics can contribute to distal tendon injury and highlights the importance of a multidisciplinary approach in similar presentations. Gait disturbances of any etiology and a non-physiological foot state cause enormous pressure on the Achilles tendon due to repeated stress and strain, which is likely the case in endurance injuries [2,4]. In cases of incorrect foot alignment, orthotics can be used to properly position the feet [1,3,4]. Differential diagnosis of Achilles tendinitis as partial tendon rupture and paratenonitis were excluded by clinical and ultrasound examinations.

After carefully searching the literature, we did not find an association of drop foot with Achilles tendinitis. To the best of our knowledge, this is the first report of Achilles tendinitis caused by spinal stenosis, radicular

injury, and neuropathy. However, this single patient observation restricts its generalizability and prevents establishing a causal relationship between lumbar radiculopathy, drop foot, and Achilles tendinitis. Further research, including prospective studies with gait analysis and larger patient cohorts, is required to validate the biomechanical association suggested in this report.

Our case provides a novel observation regarding the association between lumbar radiculopathy, drop foot, and Achilles tendinitis.

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Jobs are like going to church. It's nice once or twice a year to sing along and eat something and all that, but unless you really believe there's something holy going on, it gets to be a drag going in every single week.

Thomas Michael Disch (1940–2008), American science fiction writer and poet