

초음파와 자기공명영상으로 발견된 족근관 주위 결절성 낭종

— 증례보고 —

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A Ganglion Cyst around the Tarsal Tunnel Detected by Ultrasonography and MRI

— A case report —

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Tarsal tunnel syndrome is often misdiagnosed it shares clinical features with other diseases of the lower extremity such as lumbar radiculopathy and arthritis. Failure to diagnose and treat neuropathies effectively can cause permanent neuropathic pain. We report a case of a ganglion cyst detected early using ultrasonography and MRI in a 51-year-old man who complained of rapidly aggravating pain, numbness and paresthesia on the great toe and the first metatarsal area in the sole, symptoms that resembled tarsal tunnel syndrome. Surgical treatment could be performed early with no permanent sequelae. We could also avoid repeated steroid injections or prescription medications. (Korean J Pain 2009; 22: 65-67)

Key Words: ganglion cyst, tarsal tunnel syndrome, ultrasonography.

Failure to diagnose and treat neuropathies effectively can cause permanent neuropathic pain and functional disability.

Tarsal tunnel syndrome (TTS) is caused by compression of the posterior tibial nerve as it passes through the posterior tarsal tunnel. It is much more common in the posterior tarsal tunnel than in the anterior by compression of the deep peroneal nerve as it passes beneath the superficial fascia of the ankle.¹⁾ The most common cause of compression of the posterior tibial nerve around the tarsal tunnel is trauma to the ankle, but any occult pathology, such as a space-occupying lesion like a ganglion cyst, can cause similar neuropathic pain.²⁾

In most cases, TTS develops from unknown causes and can be treated conservatively. However, early surgical in-

tervention is mandatory when neuropathy arises from a progressing occult pathology to avoid, repeated steroid injections, prescription of several medication for neuropathic pain, and to prevent permanent neuropathic pain.

MRI and electromyography, together with clinical history and physical examination, can help to make the differential diagnosis. Ultrasonography (USG) can also be a useful technique for differential diagnosis of TTS, especially for detecting occult masses because of its non-invasiveness and real time views.

Here, we introduce a case of a ganglion cyst around the tarsal tunnel that was diagnosed using USG at the first visit and treated surgically before lasting neurologic changes occurred.

접수일 : 2009년 1월 11일, 승인일 : 2009년 1월 14일

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Received January 11, 2009, Accepted January 14, 2009

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CASE

The patient was a 51-year-old man with a 4-month history of pain, numbness, and paresthesia on the left great toe and the first metatarsal area in the sole. The pain was constant and burning. Symptoms were aggravated by pressure on the sole such as walking and weight bearing. Symptoms had initially localized in the great toe and sole but gradually extended to the second and third toes.

A physical examination did not reveal specific abnormalities except a positive tarsal Tinel's sign just below and behind the medial malleolus over the posterior tibial nerve.

USG around the tarsal tunnel area showed an anechoic and cystic mass (Fig. 1).

We then performed an MRI and nerve-conduction studies. There was a 1.1 × 1.4 × 1.2 cm unilocular, ganglion cyst

around the tibial nerve division within the tarsal tunnel on MRI (Fig. 2). Nerve-conduction studies showed that conduction velocity was reduced in the left tibial nerve and the medial plantar nerve.

There was no apparent weakness of the intrinsic muscles of the left foot, but a subtle T2 high signal change in the abductor hallucis and flexor digitorum brevis muscle was seen on MRI. We suspected subacute muscle denervation and transferred the patient to an orthopedic surgeon.

After surgery two weeks later, the patient was discharged with improved symptoms.

DISCUSSION

TTS is an entrapment neuropathy caused by compression of the posterior tibial nerve and its branches, between the calcaneum and the medial malleolus under the cover of the

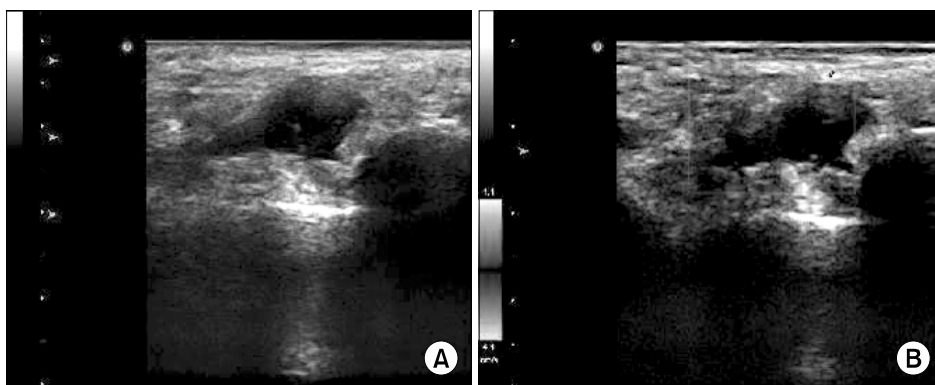


Fig. 1. Ultrasonographic images of a ganglion cyst within the tarsal tunnel. Ultrasonography shows an anechoic cystic mass in the tarsal tunnel compartment (A) and no vascularity is observed around the cystic mass on Doppler scanning (B).

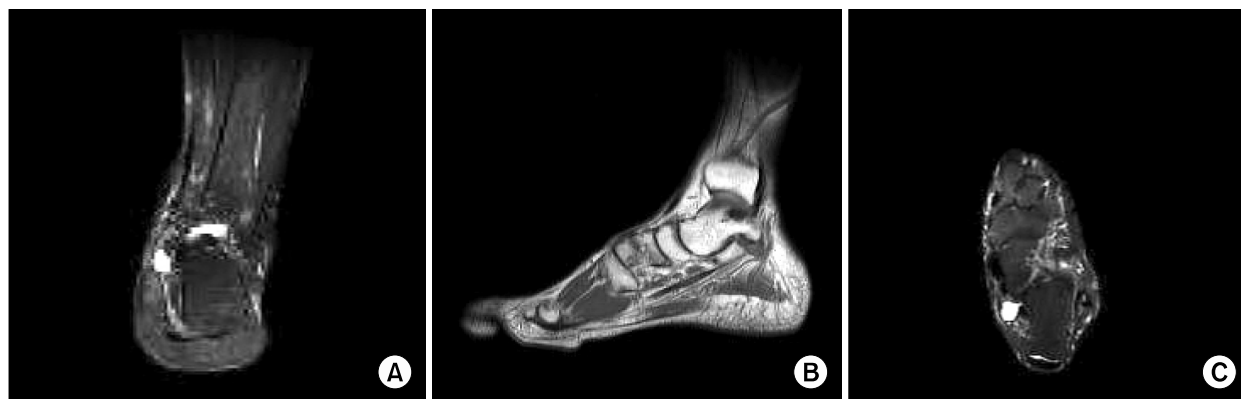


Fig. 2. MRI images of a ganglion cyst within the tarsal tunnel. A 1.1 × 1.4 × 1.2 cm unilocular, ganglion cyst around the tibial nerve division level is noted. (A) T2 weighted coronal view, (B) T1 weighted sagittal view and (C) T2 weighted axial view.

flexor retinaculum.^{3,4)} TTS can be misdiagnosed as ankle arthritis and lumbar radiculopathy.⁵⁾ However, patients with ankle arthritis have radiologic evidence of it. TTS can be distinguished from lumbar radiculopathy because patients suffering from TTS have no reflex changes, and motor and sensory changes are localized to the distribution of the distal posterior tibial nerve and its branches.

Secondary TTS by a ganglion is unusual,^{3,4)} but it can occur. Kirby and colleagues⁶⁾ found that ganglion cysts were the most common benign lesion of the foot, accounting for nearly one-third of all cases. The size and location of the ganglion cyst is influences entrapment neuropathy because the volume of the tarsal tunnel compartment ranges from 18 cm³ to 21 cm³ in normal individuals.⁷⁾ In addition, Takakura and colleagues⁸⁾ mentioned that a large ganglion can easily be diagnosed by MRI, but is difficult if it is smaller than 0.5 × 0.5 × 0.5 cm. While USG does not provide a high degree of specificity for soft tissue masses, some common benign masses have typical imaging features. A cystic and completely anechoic fluid collection around the ankle commonly represents a ganglion cyst,⁹⁾ and USG can show the cystic nature of the mass, define its extent, and in some cases reveal its origin.

In conclusion, neuropathy arising from progressing occult pathology should be treated adequately to avoid permanent neuropathic pain and functional disability.

When a suddenly exacerbated case of neuropathy is encountered, a space-occupying lesion such as a ganglion

cyst should be considered and pain clinicians must try to detect it as soon as possible. USG may be a helpful device for this effort.

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