

## A failed conservative treatment of Tarsal Tunnel Syndrome (TTS) at Bhayangkara Hospital, Bali, Indonesia: a case report

Agus Eka Wiradiputra<sup>1</sup>, Hendra Aryudi Hamzah<sup>1\*</sup><sup>1</sup>Department of Orthopaedic and  
Traumatology, Bhayangkara Hospital,  
Denpasar, Indonesia\*Corresponding:  
Hendra Aryudi Hamzah; Department  
of Orthopaedic and Traumatology,  
Bhayangkara Hospital, Denpasar,  
Indonesia  
[hendrahamzah3@yahoo.com](mailto:hendrahamzah3@yahoo.com)Received: 2021-03-07  
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Published: 2021-06-30**ABSTRACT****Introduction:** Tarsal Tunnel Syndrome (TTS) is the entrapment of the posterior tarsal nerve and its branches. This condition is uncommon and usually underdiagnosed. Misdiagnosing this condition will lead to unresolved symptoms. Pain and paraesthesia are the most common presenting symptoms. This case study aims to evaluate the failed conservative treatment of TTS.**Case Description:** A 32-years old woman presented to our clinic with pain and numbness in her left foot for 2 years. Her pain and numbness were worsened by prolonged standing and walking. Her symptoms were gradually relieved by rest and diagnosed with TTS. Surgery was performed under general anesthesia. A curvilinear incision was made posterior inferior to the medial malleolus of the left ankle. The flexor retinaculum was incised and the TTS was explored. The patient was evaluated every week for a month and a significant improvement was recorded without any complications.**Conclusion:** Surgery is indicated in TTS when conservative treatment has failed. This case study was treated by surgery decompression of the posterior tibial nerve due to failed conservative treatment.**Keywords:** Case Report, Conservative Treatment, Tarsal Tunnel Syndrome**Cite this Article:** Wiradiputra, A.E., Hamzah, H.A. 2021. A failed conservative treatment of Tarsal Tunnel Syndrome (TTS) at Bhayangkara Hospital, Bali, Indonesia: a case report. *IJBS* 15(1): 84-86. DOI: [10.15562/ijbs.v15i1.296](https://doi.org/10.15562/ijbs.v15i1.296)**INTRODUCTION**

Tarsal tunnel syndrome (TTS) is a compressive neuropathy of the posterior tibial nerve (PTN) or its branches within the tarsal tunnel of the ankle.<sup>1</sup> This condition is uncommon and usually underdiagnosed. A tarsal tunnel is a fibro-osseous tunnel located below the flexor retinaculum on the medial side of the ankle, which houses the PTN. The compression can be caused by extrinsic or intrinsic factors.<sup>1</sup>

Based on the etiology of TTS, extrinsic factors were associated with poorly fitting shoes, trauma, anatomic-biomechanical abnormalities (tarsal coalition, valgus or varus hindfoot), post-surgical scarring, systemic inflammatory arthropathies, diabetes, and post-surgical scarring.<sup>2,3</sup> In addition, the intrinsic factors were related to the tendinopathy, tenosynovitis, perineural fibrosis,

osteophytes, hypertrophic retinaculum, and space-occupying or mass effect lesions (enlarged or varicose veins, ganglion cyst, lipoma, neoplasm, and neuroma).<sup>2,3</sup> The epidemiology of TTS is unknown worldwide and often underdiagnosed disease. However, the previous studies found that the prevalence of TTS was higher in females than in males and can be seen at any age.<sup>2,3</sup>

An accurate diagnosis of TTS is often not made initially. Posteromedial pain and paraesthesia are the most common clinical manifestations. Physical findings can be detected by palpation and percussion over the nerve.<sup>4</sup> Magnetic Resonance Imaging (MRI) is highly accurate in detecting space-occupying lesions in the tarsal tunnel.<sup>5</sup> The electrophysiological study provides information about peripheral nerves and muscles.<sup>6</sup> TTS is initially treated by conservative treatments, including anti-inflammatory drugs,

immobilization, and steroid injection. Surgical indications have remained unclear. Surgical intervention is considered after a failed course of conservative therapy, including anti-inflammatory medications, immobilization, and steroid injection.<sup>7</sup>

According to the mentioned above, this case study evaluated a patient treated by surgical intervention who did not respond to conservative treatment.

**CASE REPORT**

A 32-years old woman presented to our clinic with pain and numbness in her left foot for 2 years. Her pain and numbness were worsened by prolonged standing and walking. Her symptoms were gradually relieved by rest. There was no limitation of movement reported. She was prescribed a Non-Steroidal Anti-Inflammatory Drug (NSAID) and gabapentin at the previous clinic but had shown no improvement.

There was no history of trauma prior to the beginning of her symptoms and a history of systemic diseases. A plain X-ray of the foot suggests inflammation on the tarsal bone (**Figure 1**). Physical examination revealed point tenderness on the posteromedial heel and positive Tinel's sign on her left ankle. No sign of flat foot. No abnormality was found on a plain radiograph of the ankle. The patient was tested for electromyography. Prolonged sensory latencies and decreased muscle action potential of the abductor hallucis were found.

We initially treated the patient by giving her a steroid injection which relieved the patient's symptoms for a couple of weeks. The patient also underwent physical therapy and given silicone footwear support but had obtained no benefit. The patient revisited our clinic with identical



**Figure 1.** Plain X-Ray of the foot

symptoms. On the second visit, we treated the patient by giving her Protein Rich Plasma (PRP) injection. The patient was evaluated weekly for 1 month. The symptoms persisted. We suggested the patient for surgical intervention.

Surgery was performed under general anesthesia. A curvilinear incision was made posterior inferior to the medial malleolus of the left ankle (**Figure 2**). The flexor retinaculum was incised and the tarsal tunnel was explored. The posterior tibial nerve and its branches were carefully dissected and identified. In addition, the superficial fascia was identified and released to recognize the deep fascia of the abductor's muscle. Central fibrous septa separated two tunnels in the region of the deep abductor retinaculum that divides the medial plantar nerve and the lateral plantar nerve. The central fibrous septa were resected to release both tunnels. No space-occupying lesion was found intraoperatively. There was no fibrosis found on the posterior tibial nerve and its branches. The patient was evaluated every week for a month (**Figure 3**). There was a significant improvement. The patient reported no continued symptoms and no complications.

## DISCUSSION

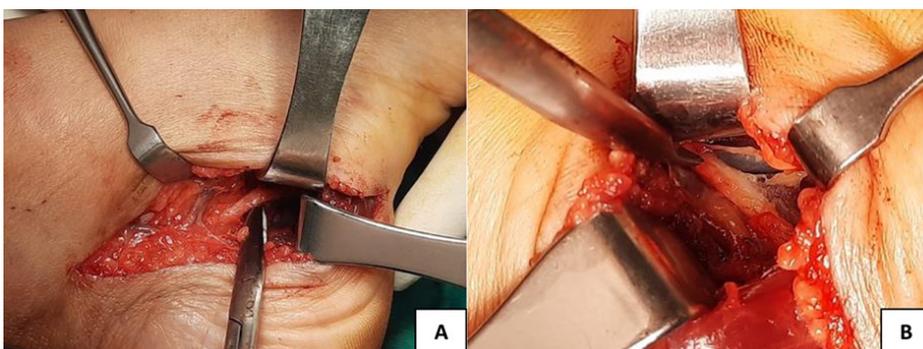
Keck C and Lam SJ first introduced TTS in 1962.<sup>8,9</sup> TTS refers to compression of the posterior tibial nerve and its branches within the tunnel made by flexor retinaculum calcaneus and talus. The structures that course along with the tibial nerves inside the tunnel are the posterior tibialis tendon, flexor digitorum longus

tendon, flexor hallucis longus tendon and the posterior tibial artery and vein. The posterior tibial branches into medial plantar, lateral plantar, and calcaneal nerves.<sup>8,9</sup>

TTS is caused by intrinsic and extrinsic factors or a combination of the two. The Intrinsic factors are osteophytes, hypertrophic retinaculum, tendinopathy, space-occupying lesion, adhesions and perineural fibrosis. The neurovascular bundles are often attached to several deep fibrous septa. Extrinsic causes are direct trauma, constrictive footwear, foot variation, lower limb edema, inflammatory arthropathy, diabetes, and post-surgical scarring.<sup>1,4</sup>

Pain and paraesthesia in the plantar heel are the most common symptoms. Burning sensation, tingling, and numbness are usually present. Symptoms are exacerbated by prolonged standing or walking. Rest and leg elevation often relieve symptoms.<sup>1,4</sup> The physical findings reveal point tenderness on the posteromedial of the heel at the lower edge of the abductor hallucis where the neurovascular structures enter the foot and positive Tinel's sign over this area.<sup>7</sup> Plain X-Ray should be obtained to rule out fractures. Computerized tomography and magnetic resonance imaging should be obtained to identify the cause of the entrapment. The electrophysiological study involves nerve conduction studies and electromyography to provide information about peripheral nerves and muscles.<sup>1,7</sup>

Conservative treatment, including anti-inflammatory drugs, activity modification, steroid injection and



**Figure 2.** Release of the deep fascia of lateral abductor muscle from (A) lateral and (B) oblique view.



**Figure 3.** Post-operative evaluation

usage of orthosis to reduce the tension, usually provide temporary benefit. In literature, physiotherapy is still lacking its effectiveness.

Surgery is indicated when conservative treatment fails and physical examination suggests nerve entrapment. Lam C first described surgical intervention in 1967.<sup>9</sup> Success rates were varied, ranging from 44% to 91%.<sup>1,10-13</sup> Surgical treatment usually involves decompression of the posterior tibial nerve and its branches by surgical release of the flexor retinaculum and deep abductor fascia. Surgical release results in a good prognosis, especially in cases secondary to mass effect within the tarsal tunnel. The poor prognosis of the disease and the operation usually were caused by intraneural fibrosis, failure to decompress the impinged nerve, damage to the nerves during the procedure, advanced age, and idiopathic completely.<sup>4,14-17</sup>

## CONCLUSION

Conservative treatment of tarsal tunnel syndrome showed no satisfying result. Symptoms persisted after the course of conservative treatment. The surgical intervention resulted in complete relief of the symptoms after a month of evaluation.

## CONFLICT OF INTEREST

There is no competing interest regarding the manuscript.

## ETHICS CONSIDERATION

Informed consent has been obtained from the patient according to the consideration of the ethics based on the COPE guidelines prior to the study being conducted.

## FUNDING

None.

## AUTHOR CONTRIBUTION

All authors equally contribute to the study by selecting case, providing appropriate surgery procedures, and writing the case study through publication.

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