SMGroup

SM Journal of Orthopedics

Case Report

Tarsal Tunnel Syndrome Due to Talocalcaneal Tarsal Coalition: A Case Report

Bulent Guneri[1], Ozkan Kose[2]*, Adil Turan[2], Baver Acar[2] and Hasan May[2]

[1]*Sutcu Imam University, Medical Faculty, Department of Orthopaedics and Traumatology, Turkey*
[2]*Antalya Education and Research Hospital, Department of Orthopaedics and Traumatology, Turkey*

Article Information

Received date: Mar 28, 2016
Accepted date: May 11, 2016
Published date: May 12, 2016

***Corresponding author**

Ozkan Kose, Department of Orthopaedics and Traumatology, Antalya Education and Research Hospital, Turkey, Email: drozkankose@hotmail.com

Keywords Tarsal Tunnel Syndrome; Tarsal Coalition; Space Occupying Lesion; Tibial Nerve

Abstract

Tarsal tunnel syndrome is an entrapment neuropathy of tibial nerve in the tarsal tunnel. The condition may be secondary to a mass compressing the nerve. This report presents an uncommon case with tarsal tunnel due to bony protrusion of tarsal coalition in an adult patient.

Introduction

Tarsal Tunnel Syndrome (TTS) is an entrapment neuropathy of tibial nerve which is compressed in the tarsal tunnel, an anatomic structure formed between bones (medial wall of calcaneus, talus and distal tibia) and flexor retinaculum. The cases are usually idiopathic whereas occasionally TTS occurs secondary to space occupying lesions such as ganglia, tumors, bony protrusions [1-8]. Tarsal coalition, a congenital disorder resulting in fibrous, cartilaginous or osseous union of tarsal bones is an uncommon cause of TTS [2,4,8]. We present a case with TTS due to talocalcaneal coalition in this report.

Case Report

A 48-year old woman presented with progressive heel pain for several years and numbness over sole of her left foot for three months. She had no past medical history of trauma or neurologic disorder. The patient had a tender swelling over the medial side of talocalcaneal articulation. Lightly tapping (percussing) over the tibial nerve to elicit a sensation of tingling or "pins and needles" in the distribution of the nerve which was called tinnel sign was positive. The anteroposterior and lateral radiographs of the ankle joint verified the hypertrophic prominence over posterior facet of talocalcaneal joint (Figure 1). MRI showed the chondrotic talocalcaneal coalition compressing the tibial nerve in the tarsal tunnel (Figure 2).

Surgical intervention was performed under spinal anesthesia with inflated thigh tourniquet after exsanguinations. Posteromedial ankle incision over the zone of tarsal tunnel was utilized. The incision began behind the medial malleolus proximally, extending distally with a curve ending 1 cm posterior to the the navicular bone tuberosity. As the flexor retinaculum released protrusion of tarsal coalition stretching the tibial nerve was noticed. After the nerve and tendons were pulled away meticulously, the bony prominence was resected (Figure 3). At the end of second week postoperatively, sutures were removed and weight bearing was allowed. The patient's complaints regressed gradually and subsided six months after surgery.

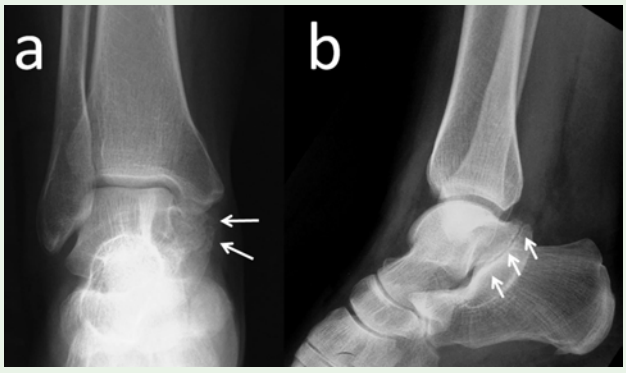

Figure 1: (a) AP radiograph of left ankle of the patient. Bony protrusion is shown by white arrows.
(b) Lateral radiograph of the ankle. Tarsal coalition of posterior facet of the talocalcaenal articulation is shown by white arrows.

Figure 2: (a) Sagittal T1-weighted MRI. Black arrows show the tibial nerve stretched by protrusion of talocalcaneal coalition.
(b) Coronal T2-weighted image. White arrow demonstrates the talocalcaneal coalition.
(c) Axial T2-weighted image. Talocalcaneal coalition of posterior facet is marked with the asterisk.

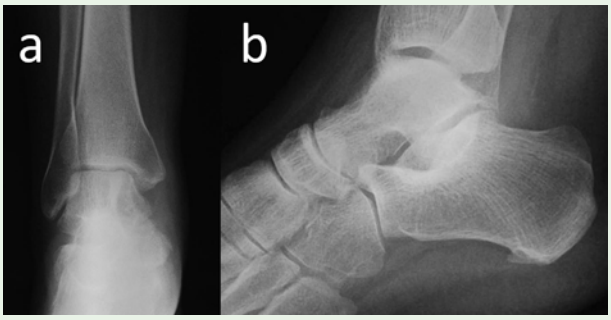

Figure 3: (a) AP radiograph of the ankle joint after resection of the tarsal coalition. Bony protrusion is vanished.
(b) Lateral radiograph of the joint. Joint space of posterior facet of talocalcaneal articulation is widened compared to preoperative lateral view.

Discussion

Tarsal Tunnel Syndrome (TTS) occurs due to compression of tibial nerve in the tarsal tunnel. This anatomic structure is bounded by medial wall of distal tibia, talus and calcaneus laterally. Superficially located flex or retinaculum, also called laciniate ligament forms the medial border. Posterior tibial nerve, posterior tibial artery and the tendons of the flexor hallucis longus muscle, flex or digitorum longus muscle, tibial is posterior muscle pass through the tunnel. The tibial nerve branches into medial and lateral plantar nerves just proximal to or inside the tarsal tunnel. Medial plantar nerve, the most commonly involved branch, is larger than lateral plantar nerve which further gives the medial calcaneal branch distally [9].

Plantar faciitis, rheumatoid arthritis, diabetic peripheral neuropathy, metatarsalgia, achilles tendinitis and morton's neuroma are considered for the differential diagnosis of tarsal tunnel syndrome. Morton's neuroma caused by compression of the plantar digital nerve is one of the most common pathology for the differential diagnosis. It is a fibros degenerative condition. Morton's neuoroma often affect the 3rd and 4th metatarsal head but it can also be seen all web spaces of the foot. Morton's neuroma initial symptoms such as TTS is pain, but the pain more seen the 3rd and 4th metatarsal head [10].

Clinical features of TTS are pain at the medial malleolus radiating distally to heel and the sole of the involved foot with hyperesthesia and paresthesia [1,3-5,11]. The symptoms aggravate with activity or rest at night [2,3,11]. On physical examination Tinel sign, sensory impairment over distribution of posterior tibial nerve branches should be sought. Although idiopathic cases have been reported, space occupying lesions (ganglia, tumors, posttraumatic bleeding, varicosities, bony prominence over tarsal coalition) are identified as causes of TTS [1-8,12]. For this reason, a mass over the zone of tarsal tunnel should be suspected and evaluated in the examination.

Tarsal coalition, an uncommon etiologic factor of TTS, is a congenital disorder with fibrous, cartilaginous or osseous union of two or more tarsal bones. Talocalcaneal coalition is one of the most common type [13,14]. Midfoot pain and recurrent ankle sprains with fixed flatfoot deformity are common complaints [15,16]. Patients generally present in late childhood and adolescence but presentation during adulthood is reported in the literature [17].

Nerve conduction studies support the diagnosis of TTS [2,4]. At the beginning of radiologic evaluation, plain radiographs are helpful for detecting bony abnormalities (bone tumor, tarsal coalition) nearby tarsal tunnel. Anteroposterior and lateral ankle views may cover the expectations. Posterosuperior oblique and Broden views are other projections used in case of talocalcaneal coalition. USG, CT and/or MRI are utilised for further radiologic evaluation [3-8,12,18,19]. We did not prefer USG because of its limited benefit in demonstrating soft tissue details. Instead of CT we preferred MRI in agreement with Lee et al. because of better delineation of soft tissue of talocalcaneal coalition and its relation with tibial nerve [8]. Besides, patient is not exposed to ionizing radiation in MRI in contrast to CT. We preferred imaging using a [1,5] Tesla Siemens Magnetom System. Images in the sagittal, axial and coronal view projections were obtained using a variety of T1 and T2 weighted spin-echo sequnces with a nominal slice thickness of 3.5 mm.

In the literature removal of mass in TTS cases results with better outcome compared to posttraumatic and idiopathic ones treated by release of flex or retinaculum [1,2,4-8,12] Moreover, failure in recognizing the presence of a mass constricting the tibial nerve in tarsal tunnel results with poor outcome [8]. Although including one case our report supports this idea. Takakura, et al. recommends immediate surgery as they report worse clinical outcome in delayed cases in a series including 50 feet of 45 patients [1]. Thus, surgery should not be delayed as the entity is diagnosed, and surgical treatment is not contraindicated.

In conclusion, TTS should be investigated considering the possibility of mass in the tarsal tunnel. Plain radiographs and MRI are suitable imaging techniques for verification and delineation of space occupying lesion as well as its relation with tibial nerve. Simple flexor retinaculum release results with poor outcome as the mass compressing the nerve left untreated.

References

1. Takakura Y, Kitada C, Sugimoto K, Tanaka Y, Tamai S. Tarsal tunnel syndrome. Causes and results of operative treatment. J Bone Joint Surg [Br]. 1991; 73: 125-128.
2. Pfeiffer WH, Cracchiolo A 3rd. Clinical results after tarsal tunnel decompression. J Bone Joint Surg Am. 1994; 76: 1222-1230.
3. Kinoshita M, Okuda R, Yasuda T, Abe M. Tarsal tunnel syndrome in athletes. Am J Sports Med. 2006; 34: 1307-1312.
4. Takakura Y, Kumai T, Takaoka T, Tamai S. Tarsal tunnel syndrome caused

by coalition associated with a ganglion. J Bone Joint Surg Br. 1998; 80: 130-133.

5. Nagaoka M, Satou K. Tarsal tunnel syndrome caused by ganglia. J Bone Joint Surg Br. 1999; 81: 607-610.
6. Yoo JH, Kim EH, Kim BS, Cha JG. Tarsal coalition as a cause of failed tarsal tunnel release for tarsal tunnel syndrome. Orthopedics. 2009; 32.
7. Garchar DJ, Lewis JE, DiDomenico LA. Hypertrophic sustentaculumtali causing a tarsal tunnel syndrome: a case report. J Foot Ankle Surg. 2001; 40: 110-112.
8. Lee MF, Chan PT, Chau LF, Yu KS. Tarsal tunnel syndrome caused by talocalcaneal coalition. Clin Imaging. 2002; 26: 140-143.
9. Bilge O, Ozer MA, Govsa F. Neurovascular branching in the tarsal tunnel. Neuroanatomy. 2003; 2: 39-41.
10. Erickson SJ, Canale PB, Carrera GF, Johnson JE, Shereff MJ, Gould JS, et al. Interdigital (Morton) neuroma: High-resolution MR imaging with a solenoid coil. Radiology. 1991; 181: 833-836.
11. DeLisa JA, Saeed MA. The tarsal tunnel syndrome. Muscle Nerve. 1983; 6: 664-670.
12. Teng HC, Chou YJ, Tsai MY, Chen CKH. Varicosities Induced Tarsal Tunnel Syndrome: a case report. J Radiol Sci 2012; 37: 175-177.
13. Takakura Y, Sugimoto K, Tanaka Y, Tamai S. Symptomatic talocalcaneal coalition. Its clinical significance and treatment. Clin Orthop Relat Res. 1991; 269: 249-256.
14. Mendeszoon M, Mendeszoon E, Orabovic S, Valentine C. Tarsal coalitions: a review and assessment of the incidence in the Amish population. The Foot and Ankle Online Journal, 2013; 6: 1.
15. Leonard MA. The inheritance of tarsal coalition and its relationship to spastic flat foot. J Bone Joint Surg Br. 1974; 56B: 520-526.
16. Wilde PH, Torode IP, Dickens DR, Cole WG. Resection for symptomatic talocalcaneal coalition. J Bone Joint Surg Br. 1994; 76: 797-801.
17. Thorpe SW, Wukich DK. Tarsal coalitions in the adult population: does treatment differ from the adolescent? Foot Ankle Clin. 2012; 17: 195-204.
18. Nagaoka M, Matsuzaki H. Ultrasonography in tarsal tunnel syndrome. J Ultrasound Med. 2005; 24: 1035-1040.
19. Nalaboff KM, Schweitzer ME. MRI of tarsal coalition: frequency, distribution, and innovative signs. Bull NYU Hosp Jt Dis. 2008; 66: 14-21.