POSTERIOR TIBIAL NERVE ENTRAPMENT IN A CLASSICAL BALLET DANCER

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Background: The patient is a 23 year old professional ballet dancer who complains of left medial arch pain and neurological symptoms of insidious onset. Her chief complaint is shooting pain, numbness and tingling of the medial arch and great toe. Aggravating activities include articulating through the foot, toe off phase of gait and during functional weight bearing activity, such as jumps. She qualifies her pain as achy ranging from 3-8/10 during activity and 8/10 after activity. She states once the pain and neurological symptoms are aggravated, they linger throughout the day. The patient has continued to dance despite her pain and neurological symptoms. Previous self-management consisted of wearing hard soled shoes and utilizing cryotherapy, neither of which provided relief to symptoms. The mechanism of injury was mechanical compression secondary to choreographic demands and dancer-specific pointe shoe modifications. Upon evaluation, visual inspection of the foot revealed a cavus foot type and minimal swelling surrounding the navicular region - from the medial malleolus through the medial longitudinal arch. Pain and neurological symptoms were reproduced with palpation of the navicular and surrounding musculature. Additionally, palpation and motion testing revealed tight gastroc-soleus complex, and rigid midfoot, decreased subtalar joint eversion and decreased posterior talar glide. Strength testing revealed moderate deficit of great toe plantar flexion. Positive special tests include tinel’s sign and slump. Neurological exam reveals decreased L5 dermatome and myotome. Differential Diagnosis: Plantar fasciitis; midfoot sprain; L5 nerve root compression; Flexor Hallucis Longus tendinopathy; Posterior Tibialis tendinopathy; Abductor Hallucis tendinopathy; Posterior Tibial Nerve entrapment. Physician referral and diagnostic testing confirmed entrapment of the Medial Plantar branch of the Posterior Tibial Nerve. Treatment: Treatment consisted of manual therapy including soft tissue mobilization (STM), tool assisted STM, joint mobilizations; taping to facilitate subtalar joint eversion and navicular pronation; activity modifications sub-threshold to increase in symptoms; and a home exercise program consisting of neural flossing and lower extremity stretching and strengthening. Uniqueness: Tibial nerve entrapments in the plantar aspect of the foot are less common than in the tarsal tunnel. Plantar surface tibial nerve entrapments have been reported in running athletes due to hyperpronation and poor running form. It is rare to see such an entrapment of mechanical origin in a pes cavus foot. Documentation of this injury in ballet dancers has been minimal. Conclusion: It is important for Athletic Trainers to understand the functional anatomy of the foot in order to correctly diagnose and treat patients with neuropraxia or nerve entrapments. Standard plan of care includes referral back to physician if resolution of symptoms is not reached with 6 months of conservative care. This patient will progress activities of daily living and dance within her functional limitations while continuing treatment to address pain, neurological symptoms, and dysfunction. Relevant Evidence: Tibial nerve entrapments are idiopathic in 20% of cases and symptomatic in the remaining 80%.1,2 No evidence based data on conservative treatment is available in the literature. There have been cases of isolated medial plantar nerve entrapment in ballet dancers requiring surgical neurolysis for definitive cure.3 Reported success rates after surgical decompression have varied in the literature from 44-96%.4

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