CONSULTATION CORNER
A Little Help From Your Friends

TRAUMATIC PERONEAL SPASTIC FLAT FOOT

Introduction
Peroneal spastic flat foot is a symptom complex characterized by pain in the hind or midfoot, limited subtalar motion, and a valgus foot associated with tightness or reflex spasm of the peroneal muscles. While coalition between the bones in the tarsal area is the most common cause, the syndrome may be secondary to a variety of disorders involving the tarsus. The anterior facet of the subtalar joint is not easily evaluated by routine radiography. Abnormalities in this area have only recently been implicated as causes of this condition. Cowell previously reported three cases of peroneal spastic flat foot with no apparent tarsal coalition in which osteochondral fractures of the anterior facet of the talocalcaneal joint were noted. A fourth such case is reported here.

Case Report
A 16 year old male, four years prior to being seen, stepped on a can sustaining an inversion injury to the right foot. Prompt lateral ecchymosis, pain, and swelling were noted followed by persistent discomfort about the lateral foot and ankle. This was exacerbated by activity and relieved by rest. He subsequently noted a decreased range of motion of the hindfoot as well as a tendency for the foot “to turn out” with activity.

An examination by a physician eight months following the injury revealed virtually no subtalar motion and unremarkable x-rays. Scar tissue formation secondary to a ligamentous injury was diagnosed.

Three years later, because of increasing pain the treating physician requested consultation. The physical exam revealed a planovalgus right foot with markedly limited subtalar motion. A diagnosis of probable tarsal coalition was made and AP, lateral, oblique and axial (Harris) x-rays were obtained (Fig. 1). No coalition was seen but degenerative changes
were noted involving the calcaneocuboid joint. Lateral tomograms of the subtalar joint were then taken and did reveal an irregularity of the undersurface of the talar head consistent with an osteochondral fracture of the anterior facet (Fig. 2).

Treatment

The patient was immobilized for two six week periods in a short leg walking cast with only transient relief and because of disabling pain, underwent a triple arthrodesis. At the time of surgery, a defect involving the talar articular surface of the anterior facet of the talocalcaneal joint consistent with an old osteochondral fracture was noted.

The triple arthrodesis fused uneventfully and when last seen, the patient was fully ambulatory without pain (Fig.3).

This case emphasizes that abnormalities of the anterior facet of the talocalcaneal joint should be suspected and looked for in an individual who presents with the clinical picture of peroneal spastic flat foot but in whom AP, lateral, oblique, and axial views fail to reveal an abnormality. Osteochondral fractures should be especially suspect when there is a history of a precipitating injury.

Discussion

The syndrome of the rigid painful flat foot accompanied by contracture of the peroneal muscles has long been recognized. Initially, there was wide acceptance of the concept that the deformity was caused by peroneal muscle spasm induced by painful stimuli arising from the tarsal joints. These stimuli were felt to result from abnormal stresses thrown upon the tarsal joints by severe degrees of pes planus. The concept therefore, was one of a flexible flat foot being transformed into a rigid flat foot by peroneal spasm.2 Over the last sixty years, however, it has been demonstrated that the majority of cases are associated with a structural anomaly, i.e., a coalition of the tarsus. Sloman first demonstrated a calcaneonavicu-
lar bar by an oblique x-ray in 1921 and Badgley in 1927 related the abnormality to peroneal spastic flat foot. Harris and Beath in 1948 demonstrated that many cases of peroneal spastic flat feet were caused by a bridge of bone which fused the talus to the calcaneus across their medial surfaces and which could be demonstrated by an axial roentgenogram showing the posterior and middle facets of the talocalcaneal joint. This description of a bar involving the middle facet of the talocalcaneal joint has been followed by subsequent reports of posterior facet talocalcaneal, calcaneocuboid, talonavicular, and cubonavicular coalitions.

In addition, it has been noted that a variety of inflammatory, neoplastic, and traumatic conditions may give rise to the syndrome. These include rheumatoid arthritis, tuberculosis, osteoid osteoma, fibrosarcoma, and fractures of the talus and calcaneus. Indeed, a biomechanical explanation has been offered to demonstrate how any disturbance of the subtalar joint that limits motion in this area may lead to a peroneal spastic flat foot.

Many authors, however, have noted patients exhibiting the clinical syndrome without apparent roentgenographic abnormalities on routine studies. The complexity of the joints makes roentgenographic analysis of the tarsal joints very difficult. Conway and Cowell in 1969 reported on the use of lateral tomography to evaluate the anterior facet of the talocalcaneal joint and to demonstrate coalitions in this area. Cowell subsequently reported on nine spastic flat feet in which AP, lateral, oblique, and axial views failed to show a tarsal coalition. Most of these feet, however, did show secondary signs of talocalcaneal coalition including talar breaking, broadening of the lateral process of the talus and narrowing of the talocalcaneal joint. Lateral tomograms demonstrated a coalition involving the anterior facet in five cases and irregularity of the anterior facet in the other four. Of the latter, three were found to have had osteochondral fractures of the undersurface of the talar head at surgery. Two occurred in heavy individuals with no history of trauma and one in an individual who had the onset of peroneal spasm following a suspected ankle injury.

Author's Note: Thanks to Henry R. Cowell, MD for reviewing the x-rays in this case.

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References