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Case Reports and Series

Naviculocuneiform Coalition: Case Reports of Two Sibling Soccer Players

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ABSTRACT

Tarsal coalitions are an abnormal union between 2 tarsal bones. They occur most commonly between the calcaneus and talus or the calcaneus and navicular but can also arise from other joints in the foot. Isolated cases of coalitions between the medial cuneiform and navicular are extremely rare, and only a few cases have been reported. Treatment recommendations are, therefore, sparse, and no long-term follow-up data have been reported. We present the case of 2 sisters, each diagnosed with a symptomatic naviculocuneiform coalition. To our knowledge, this is the first reported case in 2 first-degree relatives. Both sisters were involved in sports and presented with pain during physical activities. After conservative treatment had failed, they were both treated successfully with surgical excision of the coalition and arthrodiastasis, followed by a progressive return to activities. At the last follow-up examination at 5 and 3 years postoperatively, they remained pain free and fully involved in college soccer, making excision of a naviculocuneiform coalition with arthrodiastasis a valid treatment in the young athletic population.

Tarsal coalition, first described in the early 1700s by Buffon, is a congenital bridging of ≥2 tarsal bones of the foot (1). Coalitions result from a segmentation failure of the embryo mesenchyme segmentation. Their true incidence is unknown but has been estimated at 1% to 12.7% (1). The true incidence is believed to be as high as 39%, as reported by Leonard (2). Tarsal coalitions are also believed to be inherited as an autosomal dominant trait (3) and become symptomatic around the second decade of life (1,4) during ossification of the involved bones. The coalition creates an abnormal biomechanical motion, which, in turn, can lead to pain (5). Talocalcaneal and calcaneonavicular coalitions are the most commonly seen, accounting for >90% of all tarsal coalitions in Western countries (6–8). Coalitions between the navicular and medial cuneiform are extremely rare and most likely go unrecognized (9–13). Most reported cases are from Eastern countries, predominately Japan, making the argument for a genetic trait (14–19). Kumai et al (4) published the largest report to date, involving 40 patients, with a total of 60 feet. According to their study, naviculocuneiform coalition has an incidence as high as 39% of all tarsal coalitions (4).

The very few reports available have recommended surgical treatment after conservative measures have failed, but no long-term follow-up data are available to assess the outcomes. Arthrodesis of a coalition site is an accepted surgical approach, especially when degenerative changes are noted. A recent study by Byun et al (20) reported different results, suggesting that conservative treatment might be more appropriate. However, some studies have shown significant motion present at the navicular–medial cuneiform joint during strenuous activity, making an argument for joint preservation procedures such as arthrodiastasis with resection of the coalition and restoration of the intended motion. This is an appealing option, especially for athletes (21–24).

Case Reports

Case 1

A 17-year-old female high school soccer player presented with right midfoot pain after a soccer injury in which she had had her foot stepped on. She complained of some swelling, and minimal bruising was present immediately after the injury. She had used a

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Fig. 1. Case 1: preoperative (*A*) anteroposterior and (*B*) lateral radiographs.

boot for a few weeks but continued to have pain on returning to sport. Her foot alignment was symmetric and mildly pronated, with normal ankle and subtalar range of motion. She had no symptoms in the opposite foot. The radiographic findings were

Fig. 2. Case 1: (*A*) T_1-weighted and (*B*) T_2-weighted magnetic resonance imaging scans.

unremarkable at that time (Fig. 1). Magnetic resonance imaging was performed and revealed a plantar–medial naviculocuneiform coalition with some early degenerative changes consistent with a recent injury (Fig. 2). She also had a mild Lisfranc injury, although the interosseous ligament from the medial cuneiform to the second metatarsal base was intact. Therefore, a computed tomography scan was performed, which confirmed the injury to the

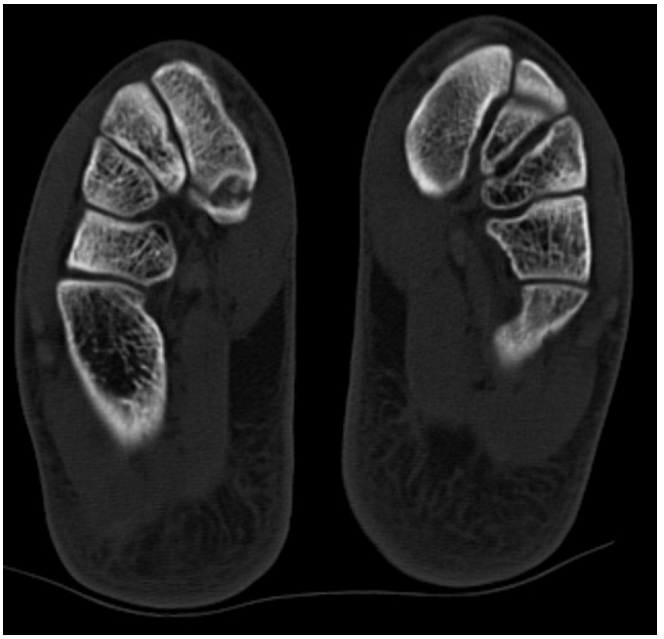

Fig. 3. Case 1: computed tomography scan.