

Arthroscopic Resection of a Bilateral Calcaneonavicular Coalition in a Child



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ABSTRACT

Calcaneonavicular coalition is a congenital anomaly characterized by a connection between the calcaneus and the navicular. It can manifest as lateral foot pain, peroneal spastic flatfoot, and repeated ankle sprains. Surgery is required in the case of chronic pain and after failure of conservative treatment. The aim of surgical intervention is pain relief and preventing recurrence. Arthroscopic resection is a minimally invasive alternative that has the advantages of quicker recovery and better aesthetic results. This technique has shown significant symptomatic improvement and no recurrence at early follow-up points in a small number of reported cases. The present report presents the case of a child with bilateral calcaneonavicular coalition. This is the first report to our knowledge that describes the outcome of simultaneous bilateral arthroscopic resection of calcaneonavicular coalition in a child with a 2-year follow-up period.

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Calcaneonavicular coalition is a rare congenital anomaly characterized by a fibrous, cartilaginous, or osseous connection between the calcaneus and the navicular. The incidence has been estimated at 1% of the general population and becomes symptomatic in only 25% of the patients (1). The typical patient with a symptomatic calcaneonavicular coalition is an adolescent aged 8 to 14 years with persistent tarsal pain, a rigid flatfoot, and repeated ankle sprains (1–3). It might also contribute to the development of osteoarthritis of the foot and ankle (4).

Surgical correction is warranted in the case of pain and failure of conservative treatment. Open procedures have been described with bone resection and soft tissue interposition to avoid recurrence (1,2,5). The most common complications of the traditional approach have been infection, hematoma, and neuromas (5–8). Resection of the calcaneonavicular coalition can also be achieved under endoscopic control, which allows minimal soft tissue trauma, leading to early recovery and mobilization (6,9). The present report presents the case of a child with bilateral calcaneonavicular coalition. This is the first report to our knowledge that describes the outcome of simultaneous

bilateral arthroscopic resection of calcaneonavicular coalition in a child with a 2-year follow-up period.

Case Report

A healthy 13-year-old male presented to our center in May 2011 with symptomatic calcaneonavicular synostosis of both feet. He had no allergies or pertinent family or surgical history and did not take any medications. Conservative treatment with different insoles for several months had failed, and he was unable to walk more than 30 minutes without crutches. He walked with a spastic flatfoot and fixed hind foot valgus deformity. The preoperative American Orthopaedic Foot and Ankle Society ankle-hind foot score was 23 of 100. The oblique radiographic view of the right foot showed the calcaneonavicular synostosis as a complete bony bar between the anteromedial process of the calcaneus and the navicular. Computed tomography with 2-dimensional (Fig. 1) and 3-dimensional (Figs. 2 and 3) reconstruction helped in understanding the boundaries of the too long anterior process. The patient was, therefore, admitted for arthroscopic removal of the synostosis.

Surgical Technique

The child was placed in a dorsal decubitus position, with a cushion under the ipsilateral buttock. A pneumatic tourniquet was applied at

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Fig. 1. Two-dimensional computed tomography scan of the right foot showing the calcaneonavicular coalition.

the mid-thigh level. Arthroscopy was performed with the help of image intensification using an oblique view. The visualization portal was posterior to the anterolateral process of the calcaneus, dorsal to the angle of Gissane (Fig. 4). After dissection using Halsted forceps down to bone contact, a 4-mm arthroscope was introduced. The instrumentation portal, distal to the calcaneal process and lateral to

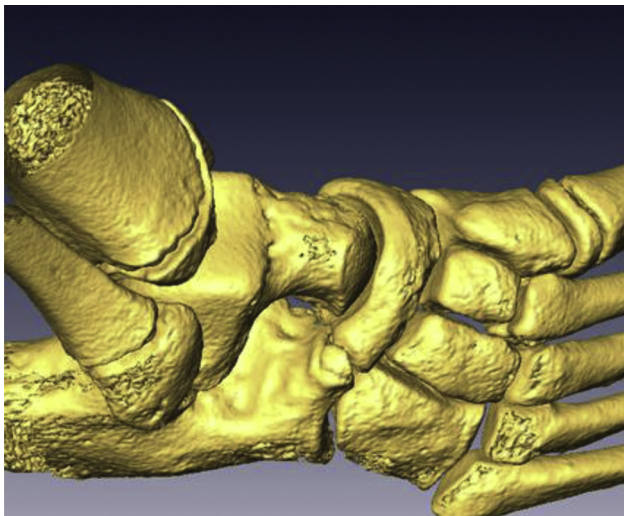


Fig. 2. Three-dimensional reconstruction of a computed tomography scan of the right foot showing the synostosis.

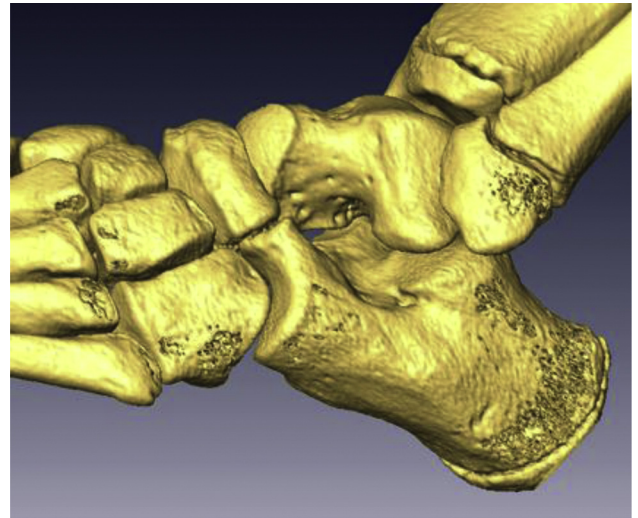


Fig. 3. Three-dimensional reconstruction of a computed tomography scan of the left foot showing the synostosis.

the extensor digitorum longus tendon, was created under visual control using a needle. A longitudinal subcutaneous dissection by Halsted forceps was undertaken, because it does not jeopardize the extensor digitorum longus and third peroneus tendons or the intermediate dorsal cutaneous nerve (Fig. 4).

Surgery proceeded downward toward the tarsal sinus using a motorized knife to create a work chamber around the coalition, which was then completely isolated and removed using a motorized burr (Fig. 5). Resection edge cauterization and fulguration were performed. Complete resection was checked by visualization of the inferior side of the talonavicular joint and calcaneocuboid joint, looking for total absence of the coalition and a calcaneonavicular joint space of ≥ 1 cm (Fig. 6), using a palpation hook as a landmark. The joint range of motion was evaluated at the end of surgery with flexion-extension and varus-valgus maneuvers.

The surgical approaches were closed using sutures in the skin. Early postoperative active and passive foot mobilization was initiated, followed by gradual resumption of weightbearing according to pain tolerance, under physiotherapy guidance. Radiographs were taken to confirm the adequacy of the bone resection. Postoperatively, active



Fig. 4. Localization of the 2 arthroscopic portals.

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