

Surgical Resection of Bilateral Coalition of the Third and Fourth Metatarsals: A Case Report



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ARTICLE INFO

Level of Clinical Evidence: 4

Keywords:
congenital
intermetatarsal
osseous
surgery
synostosis

ABSTRACT

An intermetatarsal coalition is an uncommon pathologic entity, previously reported in published studies as being primarily unilateral, most commonly between the first and second metatarsals and less so between the third and fourth metatarsals. We report an unusual case of a bilateral coalition of the third and fourth metatarsals in a 43-year-old male who presented with nonspecific dorsolateral foot pain. Conservative therapy initially failed, and resolution of pain was noted bilaterally after coalition resection.

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A coalition is defined as an abnormal osseous, cartilaginous, or fibrous union between 2 bones. Usually seen in the hindfoot, tarsal coalitions account for most symptomatic coalitions in the foot and have been a well-documented pathologic entity, typically observed in the pediatric population (1). Coalitions in the forefoot have been reported far less than have their hindfoot counterparts, constituting an uncommon pathologic entity, especially between 2 metatarsals. Because the condition is so rare, an intermetatarsal coalition could be overlooked in an adult patient with nonspecific or metatarsalgia-type pain. Previous case studies have demonstrated a scarcity in the published data regarding intermetatarsal coalitions, usually located between the first and second metatarsals or fourth and fifth metatarsals (2–8). To the best of our knowledge, we report the first case of surgical excision of bilateral coalitions localized to the proximal portion of the third intermetatarsal space.

Case Report

A 43-year-old male presented to the office of the senior author (A.R.G.) in July 2012 with a complaint of bilateral, nonspecific dorsolateral forefoot pain. The patient related that pain had been present for several years with recent worsening, especially with prolonged ambulation. He reported in his history of his present illness that “my feet do not flex well,” and he complained of stiffness

bilaterally. Despite the presence of bilateral pain, the right foot was more symptomatic. He related no history of trauma. His medical history was significant for morbid obesity (body mass index 42.4 kg/m²), diabetes mellitus with some neuritic symptoms, venous insufficiency with lower extremity edema, coronary artery disease with a history of coronary artery bypass grafting, dyslipidemia, and hypertension. All conditions were being managed appropriately with oral medications from the patient's primary care provider.

On physical examination, his pulses were weakly palpable secondary to foot and ankle edema. Protective sensation was diminished with monofilament testing, although sharp sensation was intact. Pain on palpation was noted to the dorsal foot at the level of the lesser metatarsal bases. Dorsal to plantar pressure and sagittal plane motion was applied to the third and fourth metatarsal heads (“piano keystroke” test) and elicited pain to the respective metatarsal base region. The radiographic examination showed osseous hypertrophy and bridging between the bases of the third and fourth metatarsals bilaterally (Figs. 1 and 2), which coincided with the patient's subjective symptoms. An intermetatarsal coalition with subsequent restriction of motion and osteoarthritis was diagnosed.

The patient was conservatively treated with compression therapy for his edema and was placed in custom-molded orthotics. The patient did report some pain relief; however, ultimately, after 1 year, his symptoms had not resolved. Thus, a computed tomography (CT) scan was ordered to further assess the coalition in preparation for possible surgical resection. The CT scan with additional 3-dimensional reconstruction (Figs. 3 and 4) revealed extensive periosteal new bone formation along the opposing aspects of the third and fourth metatarsal bases, possibly representing an underlying functional synostosis. The possibility of a fibrous or cartilaginous coalition could not be excluded. Moderate osteoarthritis was also visualized in the adjacent

Financial Disclosure: None reported.

Conflict of Interest: None reported.

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Fig. 1. Preoperative view of lateral oblique coalition in the left foot.

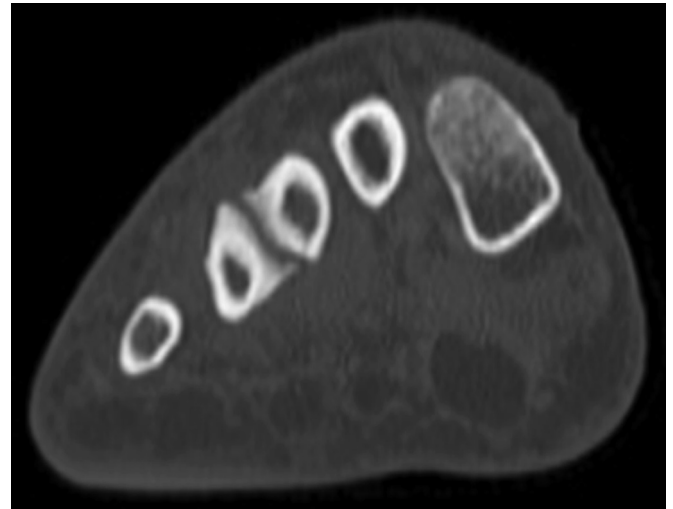


Fig. 3. Computed tomography scan of the left foot demonstrating partial osseous coalition.

joints, most likely secondary to adaptive changes from the coalition. We discussed surgical excision of the coalition bilaterally because of the continued symptoms, and the patient elected to proceed with surgery initially for the more symptomatic right foot on February 4, 2014.

Operative Technique

The procedure was performed with the patient under general anesthesia and placed supine, using a thigh tourniquet for hemostasis. A linear incision was created on the dorsal aspect of the foot overlying

the third intermetatarsal space. Incision placement was planned before tourniquet inflation using intraoperative fluoroscopy to mark the margins of the coalition. With neurovascular and tendinous structures retracted, dissection was continued down through the periosteum to identify the coalition. The coalition was noted to extend throughout the entire proximal intermetatarsal space from medially to laterally (Fig. 5). A freer elevator was used to palpate the plantar extension of the coalition, which seemed to extend to the plantar cortices of the metatarsals. The coalition seemed to be a primary osseous one intraoperatively. The coalition was resected in attempt to regain the normal contour of the metatarsals using a sagittal saw and reciprocating rasp (Fig. 6). The excised tissue was sent for pathologic examination for the histologic diagnosis. Bone wax was applied to the excision sites on the third and fourth metatarsals. No muscular interposition was performed. An immediate increased range of



Fig. 2. Preoperative view of lateral oblique coalition in the right foot.



Fig. 4. Three-dimensional reconstruction of the right foot coalition.

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