Dislocation of the Fifth Metatarsal Base Following Partial Fourth and Fifth Ray Amputation

A Case Report

Russell M. Carlson, DPM*†
Nicholas C. Smith, DPM*†
Rodney M. Stuck, DPM‡§
Ronald A. Sage, DPM†‖

This case report presents a rare postoperative dislocation of the fifth metatarsal base following a healed open partial fourth and fifth ray amputation of a 62-year-old male veteran with poorly controlled diabetes mellitus. The dislocated fifth metatarsal base subsequently created a chronic ulceration and an inhibition of normal gait. The patient was taken to the operating room where the fifth metatarsal base was resected with transfer of the peroneus brevis tendon to the cuboid to maintain biomechanical stability. (J Am Podiatr Med Assoc 102(1): 71-74, 2012)

Partial amputations of the diabetic foot are used as salvage procedures in the treatment of chronic wounds, infection, peripheral vascular disease, Charcot neuroarthropathy, or trauma. However, these procedures can be followed postoperatively by many different complications including, but not limited to delayed surgical wound healing, recurrent infection, muscle and tendon imbalance, transfer lesions, Charcot neuroarthropathy, wound reoccurrence, further amputation, and overall deconditioning. A rare postoperative complication of an open partial fourth and fifth metatarsal amputation is a dislocation of the remaining fifth metatarsal base. Many times these complications can be minimized or corrected with a tendon balancing procedure. Tendon balancing procedures are well documented in the literature as adjunctive procedures following various levels of amputation of the diabetic foot.

Review of the literature reveals several reports of resection of the fifth metatarsal with transfer of the peroneus brevis tendon but rarely following fifth metatarsal base dislocation from a previous amputation. This case report presents a unique postoperative complication of a fifth metatarsal base dislocation in a diabetic patient following partial fourth and fifth metatarsal amputation. This rare complication was subsequently treated surgically with resection of the dislocated fifth metatarsal base and transfer of the peroneus brevis tendon.

Case Report

A 62-year-old male veteran with poorly controlled type 2 diabetes mellitus, coronary artery disease (status post-coronary artery bypass graft), congestive heart failure, hypertension, and chronic tobacco use was being followed by the podiatry service as an outpatient at the Edward Hines Veterans Affairs Hospital, Hines, Illinois, for a chronic diabetic foot wound to the plantar aspect of the left fifth metatarsal head. He developed an acute infection with underlying abscess requiring incision and drainage with open amputation of the distal fourth and fifth rays. Local wound care and adequate offloading continued with a course of culture-specific antibiotics per the infectious disease service; however, the wound was slow to heal. Approximately 10 weeks following the initial amputation, the patient was returned to the...
operating room for surgical debridement of the remaining wound with further debridement of the residual fourth and fifth metatarsals of the left foot. Local wound care and offloading was again initiated with complete wound healing within 10 to 12 weeks.

The patient resumed community ambulation in accommodative shoegear with a toe-filler for the left foot. Three to 4 weeks following wound healing, the patient returned to the clinic with a complaint of pain to the lower left leg following a “pop” in his left foot during normal ambulation. Physical examination revealed pain only to the lateral aspect of the left midtibia. Left tibia-fibula radiographs were negative for any acute fracture or dislocation, and the patient was placed in CAM—walker-assisted weightbearing as tolerated. Several weeks later the patient returned to the podiatry clinic with a superficial, noninfected wound to the lateral aspect of a prominent left fifth metatarsal base. In addition, the patient now complained of pain to the lateral aspect of the left foot with ambulation. New left foot radiographs revealed a lateral dislocation of the residual fifth metatarsal base (Figs. 1A–C). Local wound care was again initiated with continued offloading in a CAM walker. Wound healing was delayed due to mechanical irritation secondary to the bony prominence from the dislocated fifth metatarsal base. Surgical intervention was discussed and planning was based on resection of the bony deformity with preservation of normal muscle function and balance. The patient was taken to the operating room for resection of the left fifth metatarsal base with transfer of the peroneus brevis tendon. Clearance from general medicine and cardiology service was obtained prior to the procedure.

In the operating room the existing 0.8 cm diameter wound was excised using two converging semi-elliptical incisions with additional incision length proximally along the course of the peroneus brevis tendon. Dissection was carried deep to visualize the peroneus brevis tendon, which was subsequently tagged and released from its insertion to the base of the fifth metatarsal. Because of significant scar tissue at the surgical site, the distal aspect of the peroneus brevis tendon required debridement to healthy tendon. The fifth metatarsal base was then resected along with the articular cartilage of the distal cuboid. The remaining peroneus brevis tendon was then anchored into the cuboid using the Opus MiniMagnum Knotless Implant suture anchor (Arthrocare Corporation, Austin, TX) with the left foot in eversion and appropriate physiologic tension on the transferred tendon (Figs. 2A and B). Postoperatively, the patient was placed in a posterior mold and instructed to remain nonweightbearing with crutches to the left foot.

The postoperative course was complicated by an acute myocardial infarction requiring cardiac catheterization 1 month following the left foot procedure. After an extended hospital stay and recovery from cardiac issues, he was transitioned back to a CAM walker 5 to 6 weeks postoperatively. The surgical incision was again slow to heal, but complete wound healing was obtained about 4 months postoperatively. At the time of writing, the patient was 25 months postoperative. He ambulates pain-free with no irritation or open wounds in a well padded, prefabricated, heat-molded, thermoplastic, solid ankle-foot orthosis and accommodative shoegear.

**Discussion**

Postoperative complications following partial amputations of the diabetic foot are well documented; however, dislocation of the fifth metatarsal base following open partial amputation of the fourth and fifth metatarsals has rarely been reported. The fifth metatarsal base resection with peroneus brevis tendon transfer procedure used in the treatment of this rare complication has been discussed previously in the literature. Schoenhaus et al described case reports of fifth metatarsal resection with subsequent peroneus brevis transfer to the cuboid, one of which was secondary to subluxation of the fifth metatarsal base following partial fifth metatarsal amputation. Roper and Altman also described resection of the fifth metatarsal base with peroneus brevis tendon transfer following fifth metatarsal base dislocation after a fifth metatarsal head resection secondary to a painful hyperkeratotic lesion.

The peroneus brevis muscle serves many purposes during the gait cycle, especially in the stance phase. The primary function of the peroneus brevis is to provide a pronation force at the subtalar and midtarsal joints in antagonism of the supinating forces across these joints. It also assists the peroneus longus muscle in transferring weight from the lateral to medial column and providing an abduction stabilizing force to the midfoot during midstance and propulsive phases of gait.

Tendon transfers, including the peroneus brevis tendon, following amputations in the diabetic foot to maintain biomechanical stability during gait are
well documented in the literature.\textsuperscript{2,3,5} Schoenhaus et al\textsuperscript{2} discussed the importance of peroneus brevis transfer, if resection of the fifth metatarsal base becomes necessary, in an effort to preserve the pronatory action of the peroneus brevis muscle. If the tibialis posterior is allowed to act unopposed, the supinatory forces will create an adductovarus foot deformity. This potential for deformity and further postoperative complications makes surgical planning important to maintain foot function following partial amputation. In this case study the patient continued to be a community ambulator despite his comorbidities, and so preservation of foot function was of primary concern.

**Conclusions**

Dislocation of the fifth metatarsal base following partial fourth and fifth ray amputation has rarely been reported in the literature as a postoperative complication of a partial foot amputation. In this case the patient was treated with a resection of the fifth metatarsal base and transfer of the peroneus brevis tendon in order to maintain biomechanical

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**Figure 1.** A, Clinical photograph following diagnosis of dislocated fifth metatarsal base. B, Lateral oblique radiograph demonstrating laterally dislocated fifth metatarsal base. C, Lateral radiograph demonstrating dislocated fifth metatarsal base.
stability and foot function during gait. This case study brings to light the rare postoperative complication of fifth metatarsal base dislocation following partial fifth ray amputation, as well as a method of repair should it be identified.

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References