Statement of Purpose
The purpose of this study is to describe a technique for the correction of flail toe using autogenous bone graft from the first metatarsal.

Literature Review
Lesser digital deformities are one of the most common problems affecting the foot. The hammertoe deformity occurs most frequently in the second toe. The most common procedures for surgical correction are arthroplasty, arthrodesis and implant arthroplasty. The arthroplasty destabilizes the digit. Pinning of the digit after arthroplasty does not provide long term stability. A consequence of destabilization with excessive bone resection is a flail toe. One surgical procedure to address the flail toe is autogenous bone graft interpositional arthrodesis. The graft for this procedure is commonly taken from the ipsilateral calcaneus. We report this procedure with one surgical procedure to prevent a second surgical site when work is indicated in the first metatarsal without a distal metatarsal osteotomy.

Case Study Continued
Attention is then directed to the first metatarsal where the typical bunion dissection is performed to expose the head of the first metatarsal. In this case, a McBride bunionectomy with lateral release is performed. A marking pen is then used to outline the size of the desired graft on the dorsal aspect of the first metatarsal (Figure 1). The graft is then harvested using a sagittal bone saw with care being taken not to violate the plantar cortex. A osteotome is used to pry the graft upward. The defect left in the first metatarsal is then packed with demineralized bone matrix putty. The graft is then laid between the middle and proximal phalanges with the cortical surface dorsally (Figure 2). A 0.045 inch Kirschner wire is advanced from the proximal portion of the graft through the middle and distal phalanges then retrograded back through the proximal phalanx and across the metatarsal-phalangeal joint. Comparison of pre and post operative photographs show restoration of length with stability of the digit (Figure 3). Comparison of pre and post operative X-Rays (Figure 4).

Analysis and Discussion
A review of failed foot surgery performed by Kilmartin found that lesser digital surgery carries a high risk for recurrence and dissatisfaction. Excessive bone resection resulting in flail toe is a complication which leaves the digit shortened and unstable. Procedures to address the flail toe include syndactilization to an adjacent toe, transposition of an osteocutaneous flap, implant arthroplasty, and free autologous bone graft arthrodesis. Syndactilization will potentially stabilize the toe; however, it does not address excessive shortening. In addition, the cosmetic appearance remains poor post-operatively. Koshima et al described an osteocutaneous flap from the lateral one-third hallux to the second digit. This technique is both technically difficult and isolated to correction in the second digit only. Implant arthroplasty is a reasonable option if there is bone stock to properly support the intraarticular device. Unfortunately, there is often extensive bone loss from the previous surgery. Free autologous bone graft arthrodesis has shown to be an effective treatment to both stabilize the digit and restore length. Koshima et al. Koshima et al.

References