Correction of Severely Deformed Hammertoe Attributable to Silastic Implant Failure with Use of Calcaneal Autograft

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Few studies exist investigating surgical hammertoe correction salvage procedures regarding poor outcomes secondary to silastic implant failure. We present a case of a patient who presented to our clinic with a grossly deformed digit after undergoing several silastic implant procedures. The patient wanted to salvage the toe and elected for surgical intervention. Surgical planning consisted of a V-Y skin plasty with interposition of calcaneal autograft. This allowed restoration of anatomic dimensions and function of the patient’s digit. We present this operative technique as a viable method of salvaging failed hammertoe correction procedures. (J Am Podiatr Med Assoc 105(1): 96-100, 2015)

Hammertoe deformity is a frequently treated pedal deformity in the podiatric clinical setting. Understanding the pathomechanics of hammertoe deformities has helped podiatric physicians in successfully treating this condition both conservatively and surgically. When surgical intervention is warranted in a particular case, there are multiple procedures in managing the condition. One particular method described in the literature is the use of silicone implants. There have been reports of low success rates and complications concerning these implants.1,2 We report the case of a patient who underwent five hammertoe correction procedures with the use of silicone implants. As a result, the patient developed a severely contracted and deformed digit, which she wanted to salvage if at all possible. The theory behind our treatment algorithm has been to use an autograft from the patient’s calcaneus to mimic the proximal phalanx of the deformed digit. This would allow restoration of dimensions of the digit, as well as restore function and decrease pain.

Mahan et al3 discussed a similar theory to treatment of flail digits due to over-aggressive arthroplasty. He proposed a surgical treatment modality by obtaining an autograft from the ipsilateral calcaneus and interposing it in the interphalangeal joint. He reported an 82% success rate in 13 patients (22 total procedures).3 There are no studies, however, that we are aware of regarding salvage of deformed digits secondary to failed silicone implant failure for hammertoe correction. We present this case to be added to the literature as a viable and alternative treatment method in managing patients with this clinical presentation.

Case Report

We present the case of a 70-year-old female who presented to the author’s clinic complaining of a shortened and painful right second digit. The patient had received care from a physician in 2005, where she underwent a bunionectomy and a second hammertoe correction procedure with Kirschner wire fixation. Postoperatively, her second digit became dorsally contracted and shortened. She subsequently underwent two additional surgeries, both of which used silicone implants, which resulted in increased shortening and contracture. The patient was then referred to another physician who attempted surgical correction twice more using silicone implants; both attempts failed.

After five surgical attempts, the patient presented to the author’s clinic seeking evaluation for possible salvage to the deformed digit (Figs. 1-3). Physical examination revealed a severely shortened and dorsally contractured right second digit with pain on range of motion. Weightbearing of the right foot exaggerated the second digit deformity, revealing its inability to purchase the ground. All measures, both conservative and surgical, were discussed in detail with the patient, and she elected to attempt surgical correction. Surgical planning consisted of V-Y skin plasty both dorsally and plantarly to the right
second digit with harvesting of cortical bone graft from the calcaneus and placement across the second metatarsophalangeal joint.

**Methods**

A dorsal 4-cm full-thickness V-plasty was performed from the medial and lateral aspects of the right second toe proximally over the second metatarsal shaft. Dissection was then continued down to the level of the second metatarsophalangeal joint. Inspection revealed a severely contracted joint with a tight extensor digitorum longus tendon. Therefore it was elected to perform a Z-plasty and dorsal capsulotomy, which resulted in reduction of the dorsal contracture deformity of the digit. The toe was then distracted distally to determine if the deformity could be restored to proper anatomic length. It was noted that the plantar skin was taut and it was decided to perform a second V-plasty. This allowed the toe to be distracted to normal length, which was measured to be 15 mm. Attention was then directed to the lateral aspect of the calcaneus, and using an osteochondral autograft transfer system (OATS) device, a 15-mm plug of bone was harvested and placed across the second metatarsophalangeal joint. The digit and autograft were fixated using a 0.45 Kirschner wire, which spanned the digit and was inserted into the second metatarsal head (Fig. 4).

**Results**

After the procedure, the patient was instructed to be nonweightbearing to the right foot. During follow-up appointments at the first postoperative week, moderate ecchymosis and vascular congestion in the digit were noted, which can be attributed to the risk
associated with lengthening such a significant contracture deformity. By extending the digit to 15 mm with the V-Y skin plasty and calcaneal autograft, this in essence placed additional traction to the vasculature of the digit. The patient was instructed to more frequently elevate the operative extremity. Sutures were removed 2 weeks after surgery with resolution of vascular congestion in the digit leading to only superficial sloughing of the skin of the digit. The Kirschner wire was maintained in the toe for a period of 6 weeks (Figs. 5-12). The patient expressed satisfaction with the outcome of the procedure at 12 months postoperatively and was pain free.

Discussion

Medical literature regarding digital salvage in surgical hammertoe correction failures is lacking, and this case provides a viable option in the management of such cases. By using a calcaneal autograft to mimic a phalanx, restoration of dimensions and function of the deformed digit was achieved in this case. The patient also was satisfied with the salvage procedure, both functionally and cosmetically. With a successful outcome 1 year postoperatively, this procedure appears to be an effective treatment option. From the observations we have provided herein, we propose this case be added to the literature as a digital salvage procedure in managing patients with these clinical presentations.

Conclusions

The goals of surgical hammertoe correction include reduction of pain and correction of deformity.4-7 Despite our knowledge of the pathomechanics of hammertoe deformities, complications can and do occur.
happen. There are few studies investigating salvage procedures to correct poor outcomes secondary to silastic implant failure. Studies have shown silastic implants to be ineffective for long-term correction of hammertoe deformities, resulting in various postoperative complications.¹,² We present this case as an effective procedure to correct poor surgical outcomes in hammertoe correction.

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Figure 7. Clinical photograph showing right foot in the dorsal view at postoperative week 2.

Figure 8. Clinical photograph showing right foot in the frontal plane view at postoperative week 2.

Figure 9. Anteroposterior radiograph of the right foot at postoperative week 2.

Figure 10. Clinical photograph showing the right foot in the dorsal view at postoperative month 6.
References


Figure 11. Clinical photograph showing the right foot in the plantar view at postoperative month 6.

Figure 12. Anteroposterior radiograph of the right foot at postoperative month 6.