Neuroma as an unusual complication of transarticular lateral release and distal chevron metatarsal osteotomy for hallux valgus: A case report

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ABSTRACT

Compared to other lateral soft tissue release methods during hallux valgus surgery, the medial transarticular approach has the advantages of being reproducible, safe, and simple. However, a few reports have described the disadvantages of medial transarticular lateral soft tissue release, including only inadequate lateral soft tissue release. Herein, we report a case of intermetatarsal neuroma in the first web space after hallux valgus correction using distal chevron metatarsal osteotomy and medial transarticular lateral soft tissue release. This case report aimed to highlight the possibility of nerve damage due to medial transarticular lateral soft tissue release during hallux valgus correction surgery.

Case Presentation

A 56-year-old woman presented with complaints of bilateral bunion pain and hallux valgus deformity. She had moderate hallux valgus deformities, with hallux valgus angles (HVAs) of 30˚ and 25˚ on the right and left sides, respectively, and intermetatarsal angles (IMAs) of 15˚ and 13˚ on the right and left sides, respectively (Figure 1). Because the patient wanted to avoid scars, we performed DCMO with Akin osteotomy and transarticular lateral soft tissue release through a single medial incision (Figure 2). At 8 weeks after surgery, plain radiographs showed union at the osteotomy site and Kirschner wires were removed (Figure 3). The surgery was performed by the corresponding author of this report, who is an expert foot and ankle surgeon.

At 6 months after surgery, the patient presented with right foot pain and bunion recurrence. The right foot radiograph confirmed the recurrence with HVA and IMA of 15˚ and 5˚, respectively, and showed a widened first web space and subluxation of the metatarsophalangeal joint (Figure 4). As per the diagnostic criteria for recurrent hallux valgus, the HVA and IMA suggested mild disease. Therefore, open lateral soft tissue release was performed, which showed a 1.5 × 2 cm mass in the dorsal first web space (Figure 5). The mass had the appearance of a neuroma originating from the common digital nerve in the first web space. We excised the soft tissue mass (Figure 6) and sent it for pathological examination. After the removal of the soft tissue mass, the first web space was spontaneously narrowed. Additional procedures, such as corrective osteotomy or extensive adductor tenotomy, were not required. The tissue biopsy findings showed proliferated peripheral nerve bundles with myxoid change and Pacinian corpuscles, as well as fibrous tissue with myxoid change (Figure 7), which confirmed the suspicion of neuroma.

Two weeks after neuroma excision, the patient’s pain disappeared and right foot deformity improved.

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The patient was satisfied with the surgical outcome for 2 years after the neuroma excision surgery.

**Discussion**

During hallux valgus surgery, open lateral soft tissue release through the dorsal first web space provides greater soft tissue release than the medial transarticular approach. Most studies have reported good clinical outcomes after first metatarsal corrective osteotomy with open lateral soft tissue release. Potenza et al performed lateral capsular release through a medial incision by the manual distraction of the proximal phalanx and division of the lateral aspect of the capsule. In addition, adductor tenotomy was performed conventionally through a dorsal incision at the level of the first web space. Panchbhavi et al reported a new technique for first web space soft tissue release, involving an incision within the web fold to hide the scar. However, similar to our patient, many hallux valgus patients express a desire for minimal foot scarring. Regardless of the size or location, any additional incision at the dorsum of the first web space may not be cosmetically satisfactory. Moreover, the risk of AVN of the first metatarsal head should be considered when DCMO is combined with extensive open lateral soft tissue release. Lee et al reported that lateral soft tissue release using...
the dorsal first web space approach may not be necessary for mild or moderate hallux valgus deformities.\textsuperscript{15} Avoidance of lateral soft tissue release prevents complications such as decreased range of motion of the first metatarsophalangeal joint, cosmetic dissatisfaction with the additional scar, and neuritis of the dorsal or plantar lateral digital nerve. Neuritis of the dorsal or plantar lateral digital nerve occurred in 25 out of 74 feet (33%).\textsuperscript{15} Therefore, we suggest medial transarticular lateral soft tissue release in combination with DCMO to avoid complications of the open technique. However, insufficient lateral soft tissue release is a major concern, depending on the surgical technique. Transarticular lateral soft tissue release through a single medial incision is a reproducible, safe, and simple technique.\textsuperscript{16}

However, our patient developed postoperative intermetatarsal neuroma after medial transarticular lateral soft tissue release and complained of recurrent painful hallux valgus deformity, rather than neurological symptoms, such as a tingling sensation. Hence, we did not perform preoperative magnetic resonance imaging or neurological evaluation. The recurrent deformity was thought to result from insufficient soft tissue release, despite successful osteotomy. We planned to redo lateral soft tissue release through a new dorsal first web incision. However, the dorsal incision at the first web space and subsequent dissection revealed a large neuroma. After complete excision of the neuroma, the first web space narrowed, foot shape improved, and recurrent hallux valgus and the pain disappeared. The cause of neuroma may have been blunt dissection of the transarticular adductor tenotomy with lateral capsulotomy using a knife or iris scissors. The sawing procedure used during DCMO is another potential cause of neuroma, as the oscillating tip of the saw blade can damage the common digital nerve. The iatrogenic intermetatarsal neuroma caused pain and a medial shift of the first metatarsal, leading to recurrent hallux valgus deformity.

Conclusion

In conclusion, attention should be paid to potential neurological complications of medial transarticular lateral soft tissue release during hallux valgus surgery. Surgeons, even those with significant experience, should consider the possible adverse effects of surgical procedures.
Informed Consent: Informed consent was obtained from the patient for publication of this report and accompanying images.

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