A Viable Osteochondral Allograft for Articular Cartilage Replacement of 1st Metatarsal Head – A Case Report

Travis R Weber, DPM 1, Phillip Wrotslavsky, DPM, FACFAS 2

1. Scripps Mercy/Kaiser San Diego Podiatry Residency, PGY1
2. Scripps Mercy Hospital, Advanced Foot and Ankle Center of San Diego

Purpose/Literature Review

Cryopreserved, viable, osteochondral allograft (CVOCA) has been proven to retain viable chondrocytes, chondrogenic growth factors, and extracellular matrix proteins within a natural laminar architecture of cartilage (1), and has proven to be an effective choice for articular cartilage repair for lesions involving lateral and medial femoral condyles, patellae, trochleas, and tibial plates (2), as well as talar domes (3-4). However, to date, no article has presented findings involving use of CVOCA of the 1st metatarsal phalangeal joint. Currently, a variety of different joint destructive procedures, as well as joint preserving procedures, have been described and proven for the treatment of 1st metatarsal phalangeal joint articular cartilage damage; yet, each have their own indications, complications, and limitations (5-6) leaving the door open for exploration of other surgical options. The purpose of this case is to present a novel treatment option, namely utilization of CVOCA in a joint preserving procedure, for end stage 1st metatarsal phalangeal joint cartilage damage.

Case Study

A case is presented of a 50-year-old female with significant, progressing pain and limited range of motion of 1st metatarsal phalangeal joint.

Cartilage was completely denuded off the 1st metatarsal head, and replaced with CVOCA. It was secured using crossing fiberwire suture passed from plantar lateral to dorsal medial and plantar medial to dorsal lateral through crossing drill holes in the neck of the first metatarsal; two more sutures from dorsal medial to plantar lateral and dorsal lateral to plantar medial were passed through the same drill holes, with all sutures tightened and secured with two 3.2 biotenedosis screws through dorsal holes to prevent suture pull out. A mini-monoral external fixator was applied for one month, providing traction across 1st metatarsal phalangeal joint while the graft was allowed to incorporate. Patient was full weight bearing immediately and returned to normal shoegear immediately following ex-fix removal.

Results

Radiographic results show increased 1st metatarsal joint space from 2.60mm, 1.50mm, and 1.20mm from lateral to medial on DP view preoperatively, to 3.10mm, 3.00mm, and 2.90mm respectively on DP view 8 months postoperatively. On lateral radiographs, 1st metatarsal joint space increased from 1.80mm to 3.47mm 8 months postoperatively.

Discussion

This case study details our technique and use of cryopreserved, viable osteochondral allograft as a complete 1st metatarsal head cartilage replacement, addressing significant pain in 1st metatarsal phalangeal joint in a joint preserving procedure with radiographically and clinically good results. This points to use of CVOCA as a viable, surgical option for 1st metatarsal phalangeal joint cartilage damage in the future.

References