

A Viable Osteochondral Allograft for Articular Cartilage Replacement of

1st Metatarsal Head – A Case Report

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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, patellas, trochleas, and tibial plateaus (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.

Figure 1: Pre-op Clinical



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 biotenodesis screws through dorsal holes to prevent suture pull out. A mini-monorail 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 shoe gear immediately following ex-fix removal.

Case Study Continued

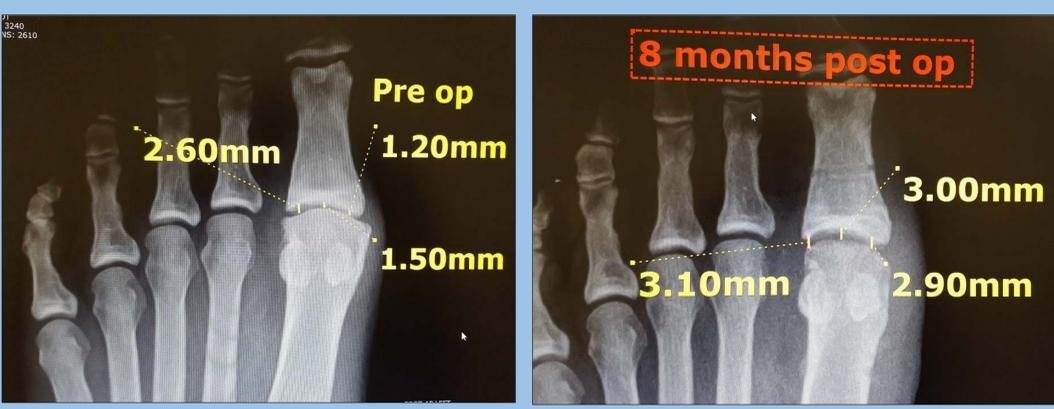
Figure 2 a,b & c: inter-post op clinical images



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.

Figure 3a & b: DP Radiographs pre/post-op respectively



Results Continued

Figure 4a & b: Lateral Radiographs pre/post-op respectively



Clinically, excellent results are seen post-operatively as demonstrated by reduction in the VAS scale. For pain intensity, the scale is most commonly anchored by “no pain” (score of 0) and “pain as bad as it could be” or “worst imaginable pain” (score of 100). Our case report saw a pre-op VAS 78, with 1 month post-operative VAS 25, and 3 months post operative VAS 5. Continued, excellent patient satisfaction is observed for total of 10 months follow-up to date. Patient returned to full activity with minimal pain and no recurrence of joint space narrowing.

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

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