Restoring Joint Spacing and Function in Lateral Midfoot Arthritis Using a Decellularized Dermal Allograft

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Surgical Summary

Clinical Presentation:

- A 62-year-old female presented with persistent pain and functional disability due to progressive arthritis of the left 4th and 5th tarsometatarsal joints (TMTJ), following prior arthrodesis of the 2nd and 3rd TMTJ. Asymptomatic non-union of the 3rd TMTJ was confirmed after complete relief was obtained following diagnostic injection into the 4th and 5th TMTJs. Conservative treatment attempts ultimately failed.
- Diagnosis: primary osteoarthritis of the left 4th and 5th TMTJs.
- Based on assessment, the decision was made to perform interpositional arthroplasty of the 4th and 5th TMTJs.
- One DermaPure®, a decellularized dermal allograft (7 cm x 10 cm) was used for interposition.

Intraoperative Findings (in the OR, DermaPure® application):

- A dorsal approach was utilized.
- Severe degenerative joint disease (DJD) to both joints was confirmed (Figure 1).
- A burr was utilized to decompress the joints, followed by interposition of a 7 cm x 10 cm DermaPure® decellularized dermal allograft, Kirschner wire fixation, and closure of the dorsal capsule (Figure 2).
- No intraoperative complications were documented.

Surgical Procedure:

- Under general anesthesia, the patient was positioned in a supine position.
- A tourniquet was applied, followed by antibiotic administration per SCIP guidelines.
- The left lower foot was scrubbed, prepped and draped in a sterile fashion. Local anaesthesia was administered to ensure adequate pain control throughout the procedure. Fluoroscopy was utilized for intraoperative guidance. Hemostasis was achieved using a calf tourniquet following manual exsanguination.
- An incision was made over the left 4th and 5th TMTJs. Care was taken to avoid branches of the sural nerve and dorsal capsule was preserved after longitudinal incision for later closure. Severe DJD was observed. A burr was used to decompress the joints and create a space for graft interposition (Figure 1).

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dCELL technology

Figure 1. Left foot with incision over the left 4th and 5th TMTJs.

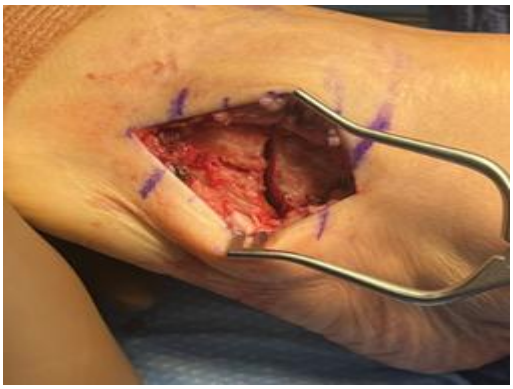
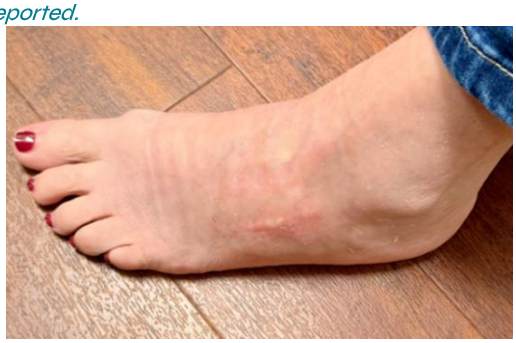


Figure 2. Placement of DermaPure® graft between the joints.

Figure 3. Week six post-op: the incision healed well. No complications related to the DermaPure® graft reported.



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- A dermal allograft (7 cm x 10 cm) was placed between the joints. The graft was carefully shaped to ensure a proper fit, avoiding excess bulk. K-wires were placed to maintain graft interposition during the immediate postoperative period, and the dorsal capsule was carefully closed to mitigate the risk of subluxation (Figure 2).
- The area was irrigated using low concentration chlorhexidine 0.05% in sterile saline, and the incision was closed in layers. A posterior splint was applied.
- Topical vancomycin combined with a hyaluronic acid alginate carrier was injected to reduce the risk of infection and support healing.
- The patient tolerated the procedure well and was discharged home in stable condition with instructions for non-weight bearing and follow-up care.

Post-Operative Notes:

- The postoperative recovery was uncomplicated, and pain levels were low.
- The postoperative weightbearing protocol was as follows:
    - Week 1-4; non-weight-bearing in a splint/cast. K-wire removal was performed at week 4.
    - Week 4-8; protected weight bearing in a walking boot.
    - Week 8; weightbearing as tolerated in a regular shoe.
    - Week 12; no issue with weightbearing, patient wears regular shoes without difficulty.
- No soft tissue or infectious complications were recorded. The incision healed without issue (Figure 3).
- Week 12 post-op: patient was doing well with no reported issues.

The final post-operative X-ray (Figure 6) showing the integrity of DermaPure® between the joints.

Figure 4. Pre-op X-ray image.

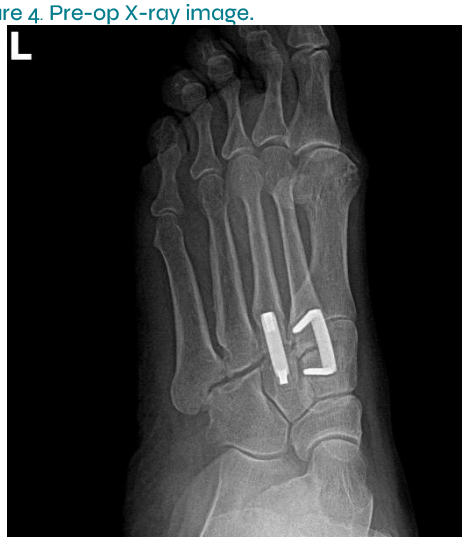


Figure 5. X-ray image taken at week 6 postoperatively.

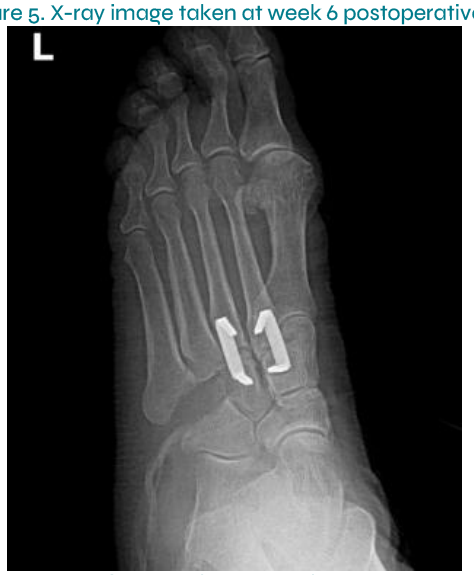
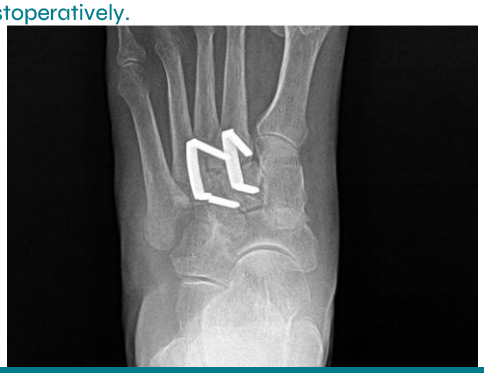


Figure 6. X-ray image taken at week 12 postoperatively.



Surgeon Perspective:

"DermaPure® served well as an interpositional graft, without the inherent limitations associated with use of peroneus brevis or peroneus tertius."