

Mesh Implant Arthroplasty for Treatment of Basilar Joint Arthritis

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Background

In searching for the best outcome for advanced stage thumb basilar joint osteoarthritis (OA), multiple surgical approaches have been explored.

Aim

This study assesses the initial results of a new surgical approach utilizing a biodegradable polycaprolactone-based mesh implant as a spacer following a trapezium and base metacarpal resurfacing osteotomy.

Methods

Using a prospective convenience design, the study assessed 15 patients between the ages of 42 and 66. The patients were suffering from OA limited to the carpometacarpal (CMC) joint of the thumb that was nonresponsive to conservative treatment over a 4 to 6 month period. Data included hand and thumb x-rays, posterior anterior, oblique, lateral and basil joint stress views, along with DASH/VAS scores and Range of Motion (ROM).

The surgical technique utilized a capsule approach (Eaton), with a biodegradable polycaprolactone mesh spacer. The capsule was divided as a metacarpal based tongue flap exposing the CMC joint. An osteotome and rasp resurfaced the joint, creating a parallel space. The mesh T-shaped spacer was inserted, affixed to the metacarpal or trapezium, depending on quality of bone stock, and secured with a suture anchor. Intraoperative imaging confirmed results. The capsule was closed and the metacarpophalangeal (MP) joint was assessed for laxity. Following 4-week immobilization, postoperative follow-up was performed - 10 days, 4, 6, 8, 12 and 24 weeks.

Results/Statistics

Mean data normalized as percentage change from pre to postoperative measures and compared to the uninvolved side revealed significant improvement of 39% for Disability Assessment for Shoulder/Hand (DASH), $p=0.0194(54.17 \pm 24$ preoperative; 32.96 ± 25 postoperative) and 54% improvement in Visual Analogue Scale for Pain (VAS), $p=0.0212(8.51 \pm 2.6$ preoperative; 3.38 ± 2.5 postoperative). Total Active Motion(TAM) in the involved thumb increased by 9% postoperative and was 96% of values in the uninvolved thumb. Tripod Pinch strength was 68% of uninvolved side preoperatively and improved to 81% postoperatively. Grip strength improved by 22% postoperatively and was 77% of values in the uninvolved thumb.

Conclusion

Mean values and early results reflected improvement, indicating that this approach could be considered for CMC basilar joint OA.

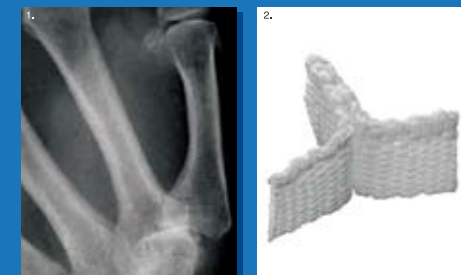
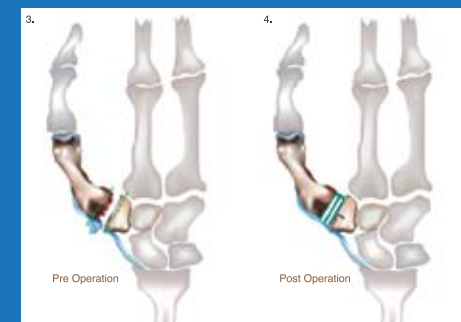


Figure 1 - X-ray of an arthritic CMC joint of the thumb.

Figure 2 - New biodegradable polycaprolactone T-shaped mesh spacer.



Figures 3 and 4 - Preoperative and postoperative views of the CMC joint undergoing Mesh Implant Arthroplasty.



Figures 5 and 6 - Postoperative x-rays of the mesh spacer in place following CMC Arthroplasty for the treatment of CMC basilar joint osteoarthritis.