CartiMax Retention in a Cadaver Knee Model

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INTRODUCTION & BACKGROUND

CartiMax is a viable cryopreserved allograft putty with superior handling properties. This scaffold provides the foundation of matrix proteins, growth factors and adherent viable cells to facilitate articular cartilage repair of focal chondral defects. CartiMax consists of two components: Viable Cartilage Fibers and Cartilage Allograft Matrix (CAM). Viable cartilage fibers, contain viable chondrocytes within the cartilage matrix fibers and these fibers are cryopreserved to maintain optimal viability. CAM is lyophilized cartilage extracellular matrix that includes key endogenous growth factors and proteins. The purpose of this study was to determine the retention and implant integrity of the CartiMax putty in a chondral thickness defect under cyclic mechanical testing.

CHONDRAL LESION PREPARATION & CYCLIC MOTION

A cadaver knee was used for this mechanical testing study. Two types of chondral defects were examined and created using a mini-open surgical technique. First, a defect was created in the medial femoral condyle (MFC) and was approximately 12mm in diameter. CartiMax putty was prepared as per the package insert and the defect was filled so that it was flush with the adjacent cartilage (Figure 1). Fibrin glue was not used in this testing. The knee was then closed and was subjected to 500 cycles of 10–90° flexion-extension motion. At the end of the 500 cycles, the knee was cycled an additional five times under a manually applied load. Following cycling, the knee was opened up to evaluate the CartiMax sample (Figure 2).

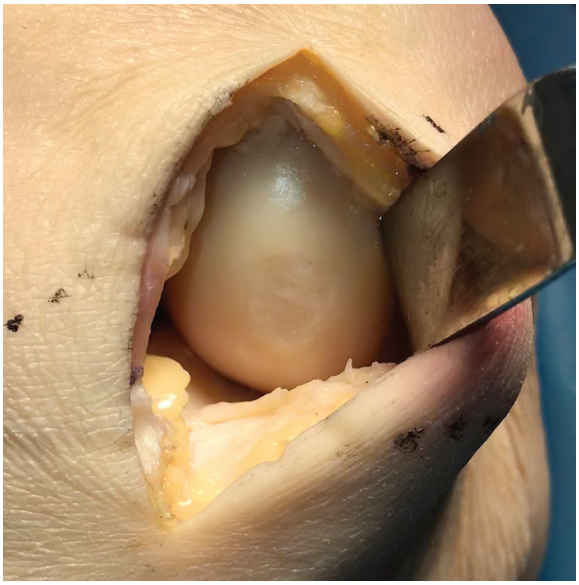

Figure 1. *CartiMax putty implanted in a MFC defect (pre-cycling)*

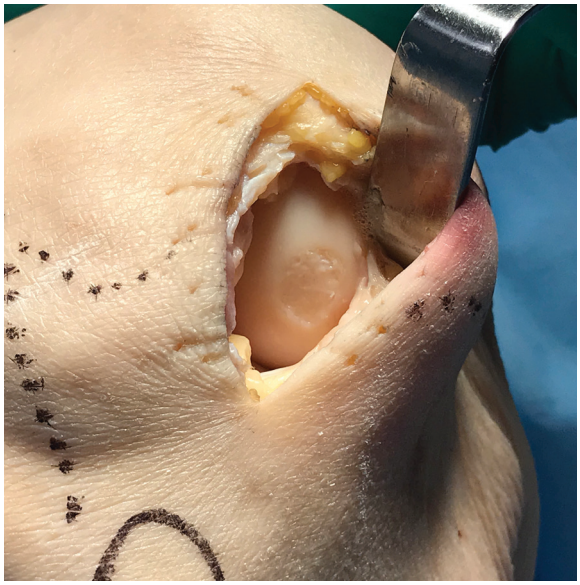

Figure 2. *CartiMax putty in a MFC defect (post-cycling)*

Another defect was created in the patella and was approximately 18mm x 12mm in size. CartiMax putty was prepared and the defect was filled so that it was flush with the adjacent cartilage (Figure 3). Fibrin glue was not used in this testing. The knee was then closed and subjected to 100 cycles of 10–90° flexion-extension motion. Following the 100 cycles, the knee was opened up to evaluate the CartiMax sample (Figure 4).

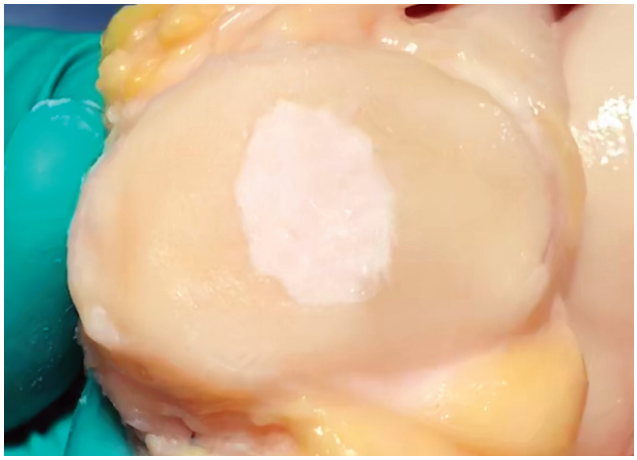

Figure 3. *CartiMax putty implanted in a patella defect (pre-cycling)*

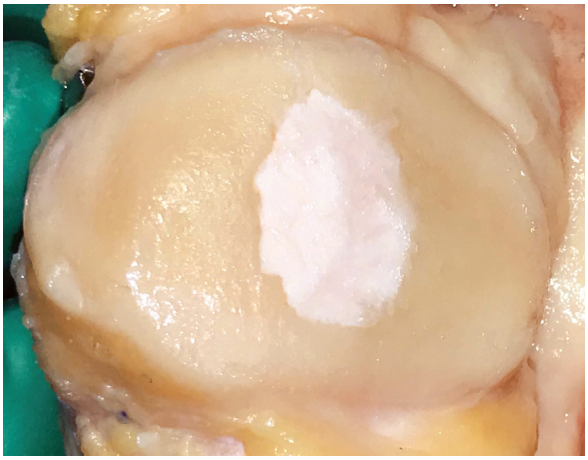

Figure 4. *CartiMax putty in a patella defect (post-cycling)*

DISCUSSION

The data generated in this study demonstrates that CartiMax is fully retained in various chondral defects after extensive cyclic testing, without the use of fibrin glue.