Human articular cartilage storage in cell culture medium: guidelines for storage of fresh osteochondral allografts


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Abstract: The viability of transplanted articular cartilage is one of the determinants of outcome following the transplantation of osteochondral allografts. Disappointing results from cryopreservation have led to the practice of fresh transplantation of articular segments, especially for posttraumatic defects. To date, no studies have demonstrated in vitro viability rates for refrigerated human cartilage awaiting transplantation. This study evaluates the effects of storage on the viability of human chondrocytes using cell culture medium. Human articular cartilage obtained from notchplasties was stored for up to 48 hours in cell culture medium. Radioactive 35S-sulfate uptake was determined at 0, 24, and 48 hours, as a measure of protein synthesis, and chondrocyte viability. Specimens were stored at 4 degrees C in culture medium. Results showed an average decrease in 35S-sulfate uptake of 0.8% at 24 hours and 6.4% at 48 hours, indicating a high level of chondrocyte viability after refrigeration. Because transplantation typically is performed within 24 hours of tissue harvest, it appears that nearly 100% of chondrocytes should survive fresh transplantation.