Comparison of Methods for Whole Elbow Osteochondral Allograft Preservation

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Introduction

Articular cartilage disorders of the elbow are common. As such, OCA transplantation merits consideration as an option for surgical treatment of cartilage disorders of the elbow. However, for many of the common elbow disorders requiring surgery, complete resurfacing of the joint using bipolar grafts may be necessary to fully address the articular pathology and restore functionally integrity to the joint. Therefore, this study was designed to determine if chondrocyte viability could be maintained at desired levels in elbow OCAs that were stored *en bloc*. Maintaining the minimum essential chondrocyte viability in whole elbow OCAs using an AATB and FDA compliant preservation protocol for at least 28 days is a critical step in optimizing methods for functional joint restoration in this large and growing population of patients. It was hypothesized that ankle OCAs stored using two novel preservation protocols would maintain minimum essential chondrocyte viability (>70% of Day 0 viable chondrocyte density) for 28 days of storage in a preclinical canine model.

Methods

All procedures were performed with ACUC approval. Elbow joints were harvested from canines euthanatized for reasons unrelated to this research and were randomly assigned to either the day 0 control (n=5), storage protocol A at 4°C (n=5), or storage protocol B at 25°C (n=5). Media was changed every 7 days, and on day 28 the cartilage tissue was then assessed for cell viability. Viable chondrocyte density (VCD) was determined by counting the number of viable cells per image and dividing it by the area of the cartilage tissue. Additionally, the %Day-0 VCD was determined for each OCA using the mean Day-0 VCD as the denominator. Significant differences among groups were determined using One-way ANOVA with significance set at $p<0.05$.

Results

Assays and data analysis for this study will be presented on the poster.