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Comparison of Basal and Cytokine Stimulated Metabolism of the Hamstring Tendon

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INTRODUCTION: Anterior cruciate ligament (ACL) tears are a common problem in the United States, affecting over 100,000 people in the United States every year. One option for ACL reconstruction after ACL tear is to use a graft obtained from the patient's Hamstring tendon (HT) to replace the torn ACL. However, it is not clear how the HT responds to the inflammatory environment of the injured knee. Therefore, this study was designed to identify the metabolic responses of the HT to pro-inflammatory stimulation. It was hypothesized that the HT would significantly increase the production of pro-inflammatory and pro-degradative biomarkers in response to cytokine treatment.

METHODS: With IRB approval, HT normally discarded after surgery were collected from 11 patients undergoing ACL reconstruction. Two 4mm explants were created from the HT of each patient, and cultured with or without 10ng/ml rhIL-1β for 3 days. After culture, media was collected for biomarker analysis. Biomarker concentration was standardized to tissue weight. Significant differences between groups were determined using a Mann-Whitey Rank Sum test with significance set at $p<0.05$.

RESULTS: HT explants significantly increased the production of pro-inflammatory (IL-6, MIP-1α, and PGE2), anti-inflammatory (IL-10), but not degradative (MMP or TIMP) biomarkers with cytokine stimulation.

CONCLUSION: Overall, cytokine stimulation appears to increase the inflammatory, but not degradative, metabolic pathways in the HT used for ACL reconstruction. Future studies will compare the HT cytokine response to other common graft tissues, such as Patellar Tendon and Quaternary Tendon.