**Synovial Fluid Biomarkers for the Prediction of Patient Outcome following Microfracture or Osteotomy**

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Objectives: The ability to predict which patients will improve following routine surgeries aimed at preventing the progression of osteoarthritis is needed to ensure patients can be stratified to receive the most appropriate treatment. This study aimed to investigate the potential of a panel of biomarkers for the prediction of clinical outcome following treatment with microfracture or osteotomy.

Methods: Proteins known to relate to OA severity, with predictive value in autologous cell implantation treatment or that had been identified in proteomic analyses (aggrecanase-1 (ADAMTS-4), cartilage oligomeric matrix protein (COMP), hyaluronic acid (HA), Lymphatic Vessel Endothelial Hyaluronan Receptor-1, matrix metalloproteinases-1 and -3, soluble CD14, S100 calcium binding protein A13 and 14-3-3 protein theta) were assessed in the synovial fluid (SF) of 19 and 13 patients prior to microfracture or osteotomy, respectively, using commercial immunoassay. Levels of COMP and HA were measured in the plasma of these patients. To find predictors of postoperative function multiple linear regression analyses were performed.

Results: Linear regression analyses demonstrated that a lower concentration of HA in pre-operative SF was predictive of improved knee function (higher Lysholm score) following microfracture surgery. Further, lower pre-operative activity of ADAMTS-4 in SF was a significant, independent predictor of higher post-operative Lysholm score (improved joint function) following osteotomy surgery.

Conclusion: This study is novel in identifying biomarkers with the potential to predict clinical outcome in patients treated with microfracture or osteotomy of the knee. Lower concentrations of HA and undetectable activity of ADAMTS-4 in the joint fluid of individuals with cartilage defects/early-OA may be used in algorithms to stratify patients to the most appropriate surgery.