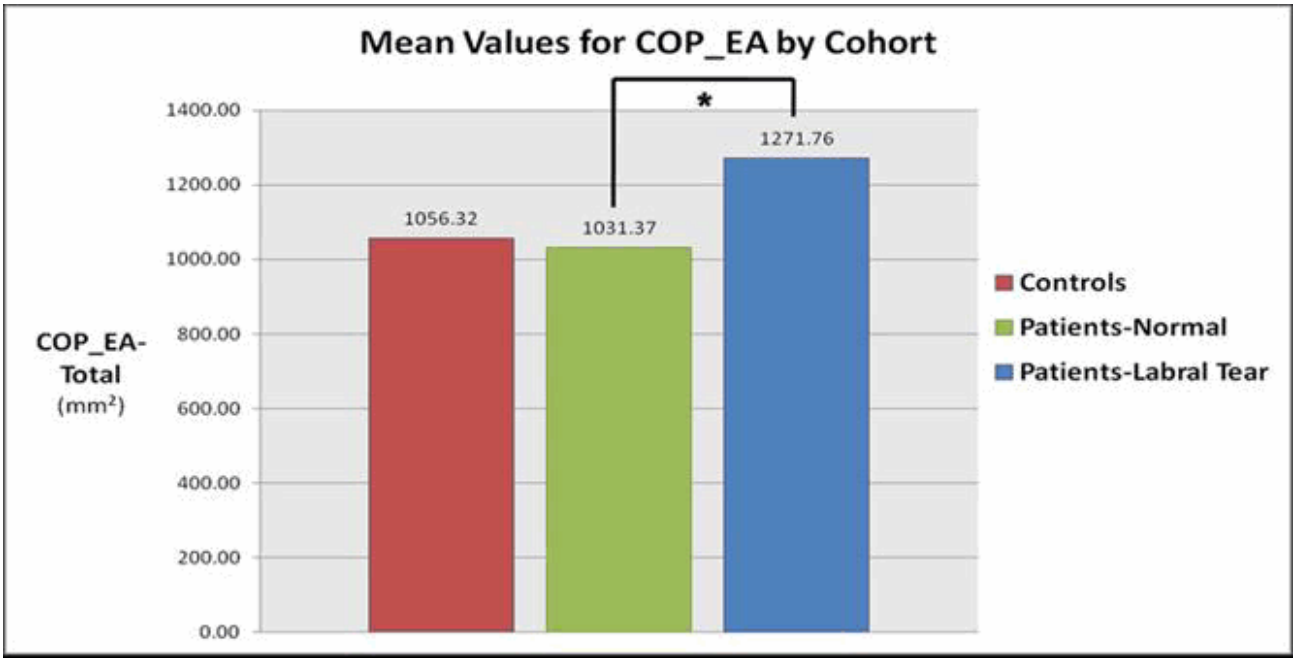
AOSSM 2010 Annual Meeting
Providence, Rhode Island USA
07/15/2010 07/18/2009
ID 9108

The American Orthopaedic Society for Sports Medicine

Title: Effect of Acetabular Labral Tears on Proprioceptive Parameters of the Human Hip Joint

Authors
Allston J Stubbs MD *(Wake Forest University, Winston-Salem, NC)*
David Holst BS *(Wake Forest University, Winston-Salem, NC)*
Benjamin L Long BS *(Winston-Salem State University, Winston-Salem, NC)*
Beth P Smith PhD *(Wake Forest University, Winston-Salem, NC)*
Martin L Tanaka PhD *(Wake Forest University, Winston-Salem, NC)*

Objectives: Acetabular labral tears are a cause of hip pain in athletes, negatively affecting daily activities and athletic performance. Due to limited diagnostic tests, arthroscopic hip surgery is often used to confirm hip labral tears. As surgery is invasive, improved non-invasive diagnostic tools for this condition are needed.1 We propose proprioceptive balance testing as a noninvasive and cost-effective method to assess patients with hip pain. This study is the first known scientific investigation into differences in balance between patients with hip labral cartilage tears and healthy controls. We hypothesized that patients with labral tears will have decreased hip joint proprioception, as quantified by established balance measurements.
Methods: Thirteen subjects 18 to 44 years old (8 healthy controls, 5 patients with labral tears) were recruited. Measures were taken to match age and weight between the cohorts. The initial testing side for each participant was randomized. The force plate measured Center of Pressure (COP) deviations for static single leg postural sway test, and these data were processed using MATLAB code. Measurements included the area of an ellipse that enveloped 95% of the data points (COP_EA, mm2). Increased values in COP_EA are associated with decreased balance and proprioception.
Results: The labral tear patient cohort had increased COP_EA (mean=1151.6 mm2) overall than did the control group (1056.3 mm2). When compared with the patients' pathologic side only, these differences were increased COP_EA = 1271.8 mm2. Figure 1 demonstrates the trend toward decreased balance seen in the patients' labral tear leg (blue) as compared to healthy controls (red) and patients' normal leg (green). Statistical significance (p=0.05) was reached between the COP_EA of patient normal leg (green) and patient labral tear leg (blue).



Conclusions: Based on our limited data set, two concepts can be drawn from our results. First, computer based balance analysis (a noninvasive test) can successfully differentiate normal subjects and symptomatic hip patients based on single leg balance. Second, patients with labral tears appear to have worse balance in the affected leg than the unaffected leg. In conclusion, we recommend consideration of proprioception balance testing as a noninvasive means to assess for hip labral tears in athletes.
Acknowledgements: Wake Forest University and Winston-Salem State University Human Performance and Biodynamics Laboratory
Wake Forest University Department of Orthopaedic Surgery
References:1. Burnett RS et al. "Clinical Presentation of Patients with Tears of the Acetabular Labrum". JBJS 2006; 88-A(7): 1448-57.