



Labral Reconstruction with Iliotibial Band Autograft and Semitendinosus Allograft Improves Hip Joint Contact Area and Contact Pressure: An In-Vitro Analysis

The Harvard community has made this article openly available. [Please share](#) how this access benefits you. Your story matters

Citation	Lee, Simon, Thomas H. Wuerz, Elizabeth Shewman, Francis McCormick, Michael Jonathan Salata, Marc J. Philippon, and Shane Jay Nho. 2015. "Labral Reconstruction with Iliotibial Band Autograft and Semitendinosus Allograft Improves Hip Joint Contact Area and Contact Pressure: An In-Vitro Analysis." <i>Orthopaedic Journal of Sports Medicine</i> 3 (7 suppl2): 2325967115S00086. doi:10.1177/2325967115S00086. http://dx.doi.org/10.1177/2325967115S00086 .
Published Version	doi:10.1177/2325967115S00086
Citable link	http://nrs.harvard.edu/urn-3:HUL.InstRepos:27662135
Terms of Use	This article was downloaded from Harvard University's DASH repository, and is made available under the terms and conditions applicable to Other Posted Material, as set forth at http://nrs.harvard.edu/urn-3:HUL.InstRepos:dash.current.terms-of-use#LAA

Labral Reconstruction with Iliotibial Band Autograft and Semitendinosus Allograft Improves Hip Joint Contact Area and Contact Pressure: An In-Vitro Analysis

Simon Lee, MPH¹, Thomas H. Wuerz, MD², Elizabeth Shewman, MS³, Francis McCormick, MD⁴, Michael Jonathan Salata, MD⁵, Marc J. Philippon, MD⁶, Shane Jay Nho, MD, MS¹

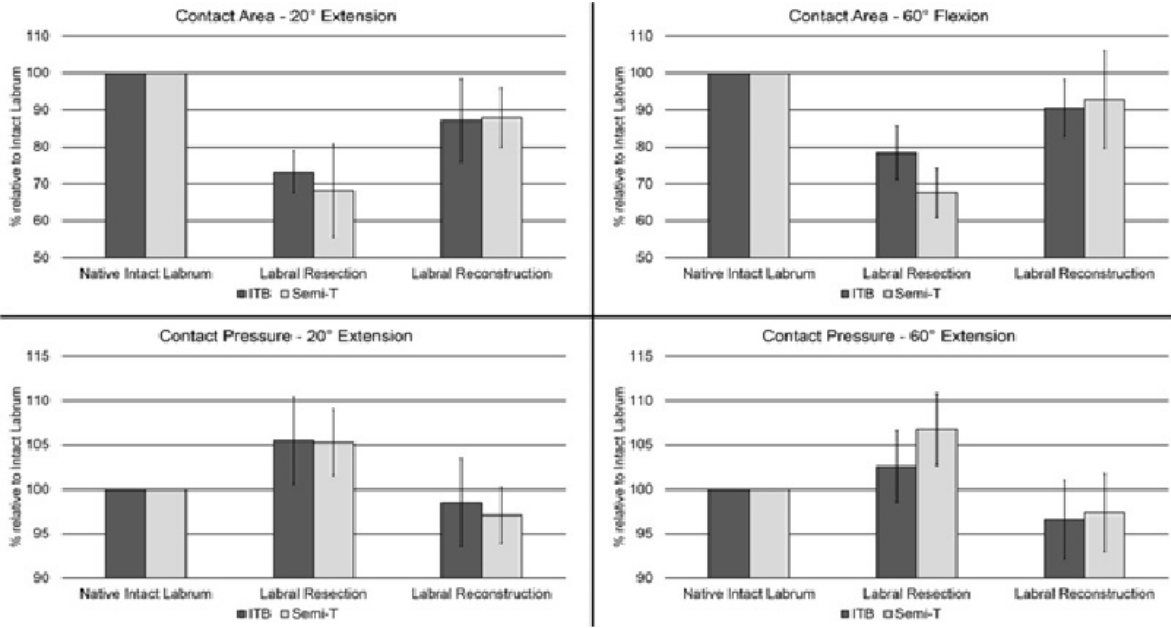
¹Rush University Medical Center, Chicago, IL, USA, ²Rush University Medical Center Program, Chicago, IL, USA, ³Rush Medical Center, Chicago, IL, USA, ⁴Harvard Medical School, Cambridge, MA, USA, ⁵University Hospitals Case Medical Center, Shaker Heights, OH, USA, ⁶Steadman Clinic, Vail, CO, USA.

Objectives: Labral reconstruction using iliotibial band (ITB) autograft and semitendinosus (Semi-T) allograft have recently been described in cases of labral deficiency. The current study seeks to understand the biomechanical effects of an intact labrum, segmental labral resection, and labral reconstruction on joint contact area, contact pressure, and peak force.

Methods: Ten fresh-frozen human cadaver hips were analyzed utilizing thin-film piezoresistive load sensors to measure contact area, contact pressure, and peak force 1) with the native intact labrum, 2) after segmental labral resection and 3) after graft labral reconstruction with either ITB autograft or Semi-T allograft. Each specimen was examined at 20° extension and 60° flexion. Statistical analysis was conducted through one-way ANOVA with post-hoc Games-Howell tests.

Results: For the ITB group, labral resection significantly decreased contact area (20°: 73.2%±5.38, $P=0.0010$; 60°: 78.5%±6.93, $P=0.0063$) and increased contact pressures (20°: 106.7%±4.15, $P=0.0387$; 60°: 103.9%±1.15, $P=0.0428$). ITB reconstruction improved contact area (20°: 87.2%±12.3, $P=0.0130$; 60°: 90.5%±8.81, $P=0.0079$) and contact pressures (20°: 98.5%±5.71, $P=0.0476$; 60°: 96.6%±1.13, $P=0.0056$) from the resected state. Contact pressure at 60° flexion was significantly lower compared to the native labrum ($P = 0.0420$). For the Semi-T group, labral resection significantly decreased contact area (20°: 68.1±12.57, $P=0.0002$; 60°: 67.5%±6.70, $P=0.0002$) and increased contact pressures (20°: 105.3%±3.73, $P=0.0304$; 60°: 106.8%±4.04, $P=0.0231$). Semi-T reconstruction improved contact area (20°: 87.9%±7.95, $P=0.0087$; 60°: 92.9%±13.2, $P=0.0014$) and contact pressures (20°: 97.1%±3.18, $P=0.0017$; 60°: 97.4%±4.39, $P=0.0027$) from the resected state. Comparative analysis demonstrated no statistically significant differences between either graft reconstruction in relation to contact area, contact pressure, or peak forces. (Figure 1).

Conclusion: Segmental anterosuperior labral resection results in significantly decreased contact area and increased contact pressures, while labral reconstruction partially restores time-zero acetabular contact areas and pressures as compared to the resected state. Although labral reconstruction improved the measured biomechanical properties as compared to the resected state, some of these properties remained significantly different compared to the native intact labrum.



The Orthopaedic Journal of Sports Medicine, 3(7)(suppl 2)
DOI: 10.1177/2325967115S00086
©The Author(s) 2015