Coracoid Impingement: A Prospective Cohort Study on the Association between Coracohumeral Interval Narrowing and Anterior Shoulder Pathologies (SS-09) Peter J. Millett, MD, MSc, Sepp Braun, MD, Marilee P. Horan, BS, and Tiffany L. Tello, BA

Introduction: Pathology of the rotator interval (RI) can be an important, although often overlooked cause of shoulder pain. A narrowed coracohumeral interval can lead to subcoracoid impingement and pain. The purpose of this study is to determine whether the width of the coracohumeral interval (CHI) on routine MRI is related to pathologies of the rotator interval (RI).

Methods: Surgical data was collected prospectively for consecutive patients who underwent arthroscopic shoulder surgery. CHI was measured on axial and oblique sagittal preoperative routine MRI studies of 94 (26 males, 68 females, average age 48.4 years) patients. 26 patients had previous surgery.

Results: The average coracohumeral distance was 11.3 mm (range 3.8 - 19.2, SD 3.7). CHI decreased with age (r=0.205;p=0.47). There was no association among CHI, gender or previous surgery (p>0.05). Pathologies of the RI (defined as long head of the biceps tendon (LHB), subscapularis or biceps pulley) were closely related to narrowing of the CHI. There was a highly significant difference in patients with RI pathologies (10.2 mm) versus without (12.3 mm) (p=0.006). Patients with a biceps pulley tear had highly significant narrower CHI compared to shoulders with no tear (9.5 vs. 11.9; p=0.003). Narrowing of the CHI is also highly significant related to rotator cuff tears including subscapularis and supraspinatus tendon (p=0.008). A complete rotator cuff tear had a smaller CHI (9.6) compared to partial tears (11.2) or no tears (12.3) or. However, patients with rotator cuff tears were older than those without. The CHI was highly significant smaller in patients with pathologies of the LHB (10.4 mm) versus no LHB pathology (12.4 mm)(p=0.009).

Conclusions: This study shows that subcoracoid space narrowing is closely related to pathologies of the RI and rotator cuff. The CHI varies across different shoulder pathologies. The CHI narrows as patients get older, and is reduced in patients with biceps pulley tears and rotator cuff tears. This supports the findings that coracoid impingement can cause lesions of the LHB, the biceps pulley and is a possible cause for rotator cuff tears. The importance of the CHI for these pathologies might have been underestimated as such in the past. The threshold at which to perform a coracoidplasty is still yet to be defined. However we recommend assessment of the CHI in all patients with RI pathologies and coracoidplasty in appropriate clinical situations.

TNF-alpha Blockade Improves Early Tendon-to-Bone Healing in a Rat Rotator Cuff Repair Model (SS-10) Lawrence V. Gulotta, MD, David Kovacevic, MD, Frank A. Cordasco, MD, and Scott A. Rodeo, MD

Summary: TNF-alpha blockade can improve the histology and biomechanical strength of a rotator cuff repair at early timepoints in a rat model.

Introduction: Rotator cuff tendons heal to bone with a fibrous scar tissue interface that is mechanically weaker than the native insertion site. This makes surgical repairs prone to failure. The presence of an inflammatory response is responsible for the formation of this scar tissue. This is a major mediator of inflammation and is upregulated in the subacromial bursa of patients with rotator cuff tears. However, the role of TNF-alpha (the primary mediator of inflammation in rotator cuff tears) in rotator cuff healing has not been explored.

Methods: To assess the role of TNF-alpha in rotator cuff healing, a rat rotator cuff repair model was used. Rotator cuff tears were created using a modified free tendon-to-bone repair model in the rat. The repair was repaired using a standard suture technique and then fixed with a suture anchor. The rats were randomly assigned to one of two groups: control (no TNF-alpha blockade) or TNF-alpha blockade (treated with TNF-alpha neutralizing antibody). The rats were euthanized 7 days post-surgery, and the repaired tendons were harvested for analysis.

Results: The results showed that the TNF-alpha blockade group had significantly better tendon-to-bone healing than the control group. The TNF-alpha blockade group had a higher histological score for tendon-to-bone healing and a higher biomechanical strength of the repair. The results also showed that the TNF-alpha blockade group had a lower inflammatory response in the repair site, as evidenced by a lower expression of TNF-alpha in the repair site.

Conclusions: These results suggest that TNF-alpha blockade can improve the histological and biomechanical strength of a rotator cuff repair at early timepoints. This suggests that TNF-alpha blockade may be a useful strategy for improving the healing of rotator cuff tears.