forming SCR or patch procedure, thought the two scores were signi
cific ISP stage 3 or 4 may be risky for occurrence of large retear after per-
3 or 4, respectively). Conclusions Operative treatment of shoulders with preop-
erative ISP stage 3 or 4 may be risky for occurrence of large retear after per-

Category: Shoulder - Rotator Cuff

Analysis of Cellular Senescence in Human Arthroscopic Rotator Cuff Repairs

Abstract ID# 21603
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Summary:
Senescent cells accumulate in aging rotator tears and may contribute to and may impair the healing potential of the rotator cuff with advancing age.

Data:
Purpose: To quantify cellular senescence in supraspinatus tendon and sub-
acromial bursa of humans with rotator cuff tears. To investigate the in vitro ef-
cicacy of Dasatinib + Quercetin (D+Q) to eliminate senescent cells and alter markers of tenogenic differentiation. Method: Tendon and bursa were harvested from patients undergoing arthroscopic rotator cuff repairs. In part 1, cellular senescence was quantified utilizing immunohistochemistry and gene expression for senescent cell markers (p16 & p21) and the senescence-associated secretory phenotype (SASP) (IL-6, IL-8, MMP-3, MCP-1). Multiple markers were used due to a lack of specific markers for senescent cells. The amount of senescence was compared between patients <60 and ≥60 years old. In part 2, an in vitro culture model of rotator cuff tears was treated with D+Q or control. The ability of D+Q to kill senescent cells and alter markers of tenogenic differentiation was assessed by gene expression. Results: Part 1 demonstrated an age-dependent significant increase in the relative expression of p21, IL-6, and IL-8 in tendon, and p21, p16, IL-6, IL-8, and MMP-3 in bursa (p<0.05). A significant increase was seen in immunohistochemical staining of bursa p21 (p=0.028). Part 2 demonstrated that D+Q significantly decreased senescent markers in tendon (p21, IL-6, and IL-8) and bursa (p21 and IL-8) (p<0.05). ELISA analysis demonstrated decreased release of the SASP (IL-6, MMP-3, MCP-1; p=0.002, p=0.024, p=0.001, respectively). Both tendon (p=0.022) and bursa (p=0.027) treated with D+Q significantly increased the expression of type I collagen. Conclusions: While there was an age-dependent increase in markers of cellular senescence, this relationship was not consistently seen across all markers and tissues. D+Q demonstrated moderate efficacy in decreasing senescence in these tissues and increasing type I collagen expression. Clinical Relevance: Cellular senescence contributes to diseases of aging and may impair the healing potential of the rotator cuff with advancing age.

Category: Shoulder - Rotator Cuff

A Biomechanical Evaluation of the Efficacy Of Suture Tape Augmentation for Subscapularis Tear Repair

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Summary:
Augmentation of subscapularis with two inverted mattress suture tapes significantly increases the strength of the repair.

Data:
Background: Repair of the subscapularis tendon following anatomic total shoulder arthroplasty (rTSA) is important to restore the function of the shoulder. Failure of a subscapularis repair construct can result in difficulty with internal rotation and an increased likelihood of dislocation. While suture tape has been demonstrated to be an efficacious augment for tendonous repairs elsewhere in the body, it has not been investigated as a technique for augmenting sub-
scapularis peel repairs. The purpose of this study is to determine the biome-
chanical efficacy of suture tape augmentation for the repair of a subscapularis peel. Methods: Twelve human cadaveric shoulders underwent a subscapularis peel. Specimens were randomly split into two groups; one which underwent repair using three Mason-Allen sutures (control) and one which underwent the repair with augmentation using two suture tapes placed in an inverted mattress fashion and secured to the proximal humerus using a suture anchor (augment). Shoulders underwent biomechanical testing to compare repair displacement with cyclic loading, load at ultimate failure, and construct stiffness. Results: There were no significant differences in displacement across cyclic loading between the two repair groups at the superior (p>0.07), middle (p=0.47), or inferior (p=0.77) portions of the subscapularis tendon. Load to failure was significantly greater in the augment group (585.1N ± 81.8) than in the control group (358.5N ± 97.4; p<0.001). Stiffness was also greater in the augment group (71.8N/mm ± 13.7) when compared with the control group (48.7N/mm ± 5.7; p<0.001). Conclusions: Subscapularis peel repair with augmentation via two inverted mattress suture tapes secured with an anchor in the proximal humerus conferred significantly greater load at ultimate failure and construct stiffness when compared to a traditional repair using three Mason-Allen sutures.

Category: Shoulder - Rotator Cuff

Bridging Reconstruction For Large-To-Massive Rotator Cuff Tears Has A Low Rate Of Cuff Arthropathy Progression At A Minimum Five-Year Follow-Up

Abstract ID# 22515
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Summary:
At a minimum 5-year with a mean follow-up of 7.3 years, bridging reconstruction showed 98% survivorship rate with a low rate of conversion to rTSA and a low progression of cuff.

Data:
Background: Rotator cuff tears cause pain, muscle weakness, and difficulty with overhead activity. While smaller tears are easier to repair, large-to-massive cuff tears (>3 cm in size) are considered irreparable. For patients with large-to-
massive cuff tears, surgical options include maximal repair, superior capsular reconstruction, bridging reconstruction, tendon transfers and reverse total shoulder arthroplasty (rTSA). Bridging reconstruction was developed to improve outcomes and to avoid the morbidity associated with other technique. Bridging reconstruction, also known as graft interposition, has been shown to be a superior outcome as compared to maximal repair with better patient-reported outcomes at two-years post-operatively as recently demonstrated in a randomized controlled trial. These positive results are maintained at five years, however the mid-term changes in progression of rotator cuff arthropathy and conversion to rTSA have not been assessed. Purpose: To assess the progression of rotator cuff arthropathy in bridging reconstruction patients at a five-year follow-up. Methods: Forty-four patients who underwent bridging reconstruction between 2012 and 2017 for large-to-massive rotator cuff tears were included. All patients had a minimum five-year follow-up. Data collected included de-
mographics, pre- and post-operative Western Ontario Rotator Cuff (WORC) Index, conversion to rTSA, and X-ray readings (including acromiohumeral dis-
tance as measured on anterior-posterior pre/post-operative radiographs) and Hamada grades for rotator cuff arthropathy). Furthermore, a sub-group analysis was performed on post-operative MRIs for graft status. Results: The mean age at