itself, and its impact on post-operative outcomes. We hypothesize that cuff thickness will be associated with clinical outcomes after arthroscopic rotator cuff repair in patients with full-thickness rotator cuff tears, especially in the elderly (aged > 65 years). Methods We prospectively recruited all patients aged 65 years and above who underwent arthroscopic repair of small to medium full-thickness rotator cuff tears at our institution. These patients were followed up for a minimum of 2 years post-operatively. Basic biodata, as well as Visual Analog Scale (VAS) for pain, Constant-Murley Score (CMS), UCLA Shoulder Score (USS), and Oxford Shoulder Score (OSS) at 3 different time points (pre-operatively, 1 year post-operatively, and 2 year post-operatively) were collected. Cuff thickness was measured by independent blinded radiologist on pre-operative ultrasonographic images. Repeated measures ANOVA was performed to determine differences in clinical scores between each time period.

Multiple linear regression was used to examine the effect of tendon thickness, as well as other variables such as age and gender, on VAS, CMS, USS, and OSS at 2 years post-operatively. Results A total of 42 patients with minimum 2 year follow up were included in this study. There were 12 male and 30 female patients, and the cohort had a mean age of 74 (4) years. Mean tendon thickness measured was 5.3 (1.7) mm, and mean tear size was 1.5 (0.7) cm. Regression analysis revealed that tendon thickness had no effect on VAS, CMS, UCLA, and OSS scores at 2 years post-operatively. All clinical scores (VAS, CMS, USS, and OSS) improved significantly at 1 year post-operatively (p < 0.05) when compared to pre-operative values, and all improvement in scores met the minimum clinically important difference (MCID) established in previous studies. While these scores continued to improve from 1 to 2 years post-operatively, the differences detected were no longer statistically significant (p > 0.05).

Discussion Arthroscopic cuff repairs result in excellent clinical outcomes for small to medium sized tears in elderly patients aged 65 and above, with clinically important improvements in VAS, CMS, UCLA and OSS scores seen at 1 year post-operatively. Contrary to our hypothesis, tendon thickness did not appear to have any effect on clinical outcomes at 2 years post-operatively. However, post-operative sonographic evaluation may shed further light on whether cuff thickness plays a role in tendon healing and retear rates, which are known to have poor correlation with clinical outcomes as well.

Category: Shoulder - Rotator Cuff

Arthroscopic Single-Stage Capsular Release and Rotator Cuff Repair for Cuff Tears With Concomitant Stiffness. A Comparative Analysis of Functional and Radiological Outcomes

Abstract ID# 22914

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Summary:

Single-STAGE ARTHROSCOPIC REPAIR AND CAPSULAR RELEASE FOR ROTATOR CUFF TEARS WITH STIFFNESS RESULTS IN A GOOD CLINICAL AND RADIOLOGICAL OUTCOME WITH COMPARABLE RETEARS IN BOTH GROUPS

Data:
Introduction There has been limited literature comparing the outcomes of concomitant treatment of rotator cuff tears with stiffness using a single-stage operative procedure. Our study aimed to analyse the functional outcomes & retear rates after a single-stage arthroscopic capsular release (ACR) & cuff repair for patients with cuff tear & stiffness by conducting a matched cohort analysis with cuff repairs without stiffness. Materials and Methods Patients who presented with full-thickness rotator cuff tears & concomitant stiffness were included in the study (Group I(n = 19)). Clinical assessment was done in terms of range of motion (ROM), Visual analogue score (VAS), Constant score & American Shoulder Elbow Surgeons (ASES) scores. Group I was compared to a matched cohort of patients undergoing cuff repair without stiffness during the same study period (Group II(n = 38)). MRI analysis was done at one year postoperatively to assess healing of the cuff. Results: 19/41 patients in group I with a mean follow-up of 27.3±14.2 months were compared to 38/420 in group II patients at a mean follow-up of 35±8.1 months. All parameters improved significantly postoperatively & were comparable in both groups though recovery was slower in Group I. We had 3/19(15.8%) & 8/41(21%) retears in Group I & II respectively, however this difference was not statistically significant. Conclusion: Single-stage arthroscopic repair and capsular release for rotator cuff tears with stiffness results in a good clinical and radiological outcome. Retear rates are comparable to cuff tears without stiffness.

Category: Shoulder - Rotator Cuff

Does Allogenous Dermal Scaffold Augmentation Improve Rotator Cuff Healing and Clinical Outcomes in Large to Massive Rotator Cuff Tear? A Retrospective Case-Controlled Study With Arthroscopic Partial Repair On Clinical and Radiologic Evaluation

Abstract ID# 23035

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Summary:
In large to massive rotator cuff tears, arthroscopic partial repair with allogenous dermal scaffold augmentation yielded superior tendon thickness and increased acromio-humeral distance postoperatively compared to partial repair only.

Data:
Background: Treatment of large to massive rotator cuff tears is challenging and has led to use of scaffold augmentation for better healing. Although poor tendon quality and vascularity are known for failure of rotator cuff healing, biological and mechanical repair with allogenous augmentation has shown a promising outcome as a viable treatment option Objectives: We hypothesized that incorporation of allogenous dermal scaffold augmentation in addition to large to massive rotator cuff repair would result in improved clinical outcomes and mechanical strength supported by radiologic evidence of superior tendon integrity and less postoperative retears. Study Design & Methods: The study was composed of a total of 55 patients with large to massive rotator cuff tears. The patients were divided into two groups; Group A (28 patients) underwent arthroscopic partial repair, and Group B (27 patients) had allogenous dermal scaffold graft augmentation after partial repair. Clinical assessment included University of California-Los Angeles, Constant-Murley score, and visual analogue scale at preoperative, postoperative 3rd, 6th, and 12th month periods. Radiologic assessment, including magnetic resonance imaging, was performed preoperatively and postoperatively to assess repaired tendon integrity, based on Sugaya classification. Results: The mean follow-up period for Group A and B were 14.5 months and 16.3 months, respectively. In both groups, all clinical functional scores improved at the final follow-up. Postoperative magnetic resonance imaging revealed 4 retears and 2 retears in group A and B, respectively, and superior postoperative repaired tendon thickness in Group B to Group A with statistical significance (p-value 0.00). In addition, acromio-humeral distance was significantly improved postoperatively in both groups, from 7.25 mm to 9.44 mm in Group A and from 7.41 mm to 10.99 mm in Group B, but the group B showed superior improvement in acromio-humeral distance than group A. (p-value 0.05)

Conclusions: In large to massive rotator cuff tears, arthroscopic partial repair with allogenous dermal scaffold augmentation yielded superior tendon thickness and increased acromio-humeral distance postoperatively compared to partial repair only.

Category: Shoulder - Rotator Cuff

Effect Of Bone Marrow Aspirate Concentrate With Different Carriers For The Regeneration Of Tendon In A Chronic Rotator Cuff Tear Model Of Rabbit

Abstract ID# 23036

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Summary:
BMAC with two different carriers could effectively achieve the multi-lineage differentiations and gene expressions, compared to those without carrier, at the early phase. However, the combination of BMAC and atelocollagen finally had more superior tendon-to-bone healing effects in a RCT model of rabbit.

Data:
Background: Even though bone marrow aspirate concentrates (BMAC) was investigated to promote tendon-to-bone healing in animal and human study, it is still debatable whether stem/progenitor cells could maintain the biological stability without any carrier environment. This study was designed to evaluate the effect of bone marrow aspirate concentrate with different carriers for the
regeneration of tendon in a chronic rotator cuff tear (RCT) model of rabbit. Method: In vitro, the cellular properties as well as the expression profiles of growth factors of BMAC were analyzed. The multi-lineage differentiation potential of BMAC with different carriers (atelocollagen and poly-deoxyribonucleotide) was also assayed. In vivo, sixty-four rabbits were randomly allocated 4 groups (n = 16 each). To create the chronic RCT model, we induced complete supraspinatus tendon tears in both shoulders, and left them untreated for 6 weeks. All transected tendons were repaired in a transannular manner with saline injection in group A, only BMAC injection in group B, BMAC + poly-deoxyribonucleotide (PDRN) injection in group C, and BMAC + atelocollagen injection in group D. Genetic analysis was performed at 4 weeks after repair (8 rabbits per group), and the biomechanical analysis was performed at 12 weeks after repair (8 rabbits per group). Results: In vivo, the successful multi-lineage differentiations of BMACs were achieved under the both PDRN and atelocollagen ended, forming multiphase tissues with tendon and cartilage-like regions, and there were no differentiation differences between two carrier environments. In vivo, groups with carriers (group C and D) showed higher collagen type Iα1, and there were no differentiation differences between two carrier environments.

**Methods:** In vitro, the cellular properties as well as the expression profiles of growth factors of BMAC were analyzed. The multi-lineage differentiation potential of BMAC with different carriers (atelocollagen and poly-deoxyribonucleotide) was also assayed. In vivo, sixty-four rabbits were randomly allocated 4 groups (n = 90? [60.0–155.0] vs. 150? [95.0–170.0]; p < 0.001) at 4 weeks after repair. Conclusion: BMAC with two different carriers could effectively achieve the multi-lineage differentiations and genetic expressions, compared to those without carrier, at the early phase. However, the combination of BMAC and atelocollagen finally had more superior tendon-to-bone healing effects in a RCT model of rabbit.

Category: Shoulder - Rotator Cuff

**Superior Capsular Reconstruction Using An Acellular Dermal Xeno- Or Allograft for the Treatment of Irreparable Posterosuperior Rotator Cuff Tears: Clinical and Radiographic Outcome at Minimum 2-Year Follow-Up**

Abstract ID# 23248
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Summary: Superior capsular reconstruction leads to an improvement of pain and shoulder function in a cohort with irreparable posterosuperior rotator cuff tears.

Data: Purpose: The purpose of this study was to evaluate the clinical and radiological outcome following superior capsular reconstruction (SCR) as a salvage procedure for patients with irreparable posterosuperior rotator cuff tears. It was hypothesized that SCR would lead to a significant reduction in pain and improvement of shoulder function, but that a low rate of graft integration would be observed. Material and Methods: Patients with irreparable posterosuperior rotator cuff tears, who underwent SCR with an allograft (acellular dermal patch) or xenograft (porcine xenograft) between the 05/2018 and 03/2020, were eligible for participation. Pre- and minimum 24 months postoperatively, patient-reported outcome measures (PROMs; American Shoulder and Elbow Society Score (ASES); Subjective Shoulder Value (SSV); Visual Analog Scale [VAS] for pain) and shoulder range of motion were evaluated. Additionally, isometric abduction, flexion, and external rotation strength was tested postoperatively using an isokinetic dynamometer and compared to the contralateral side. Lastly, magnetic resonance imaging was performed to evaluate graft integration. The pre- to postoperative change in PROMs and side-to-side difference in ROM as well as isometric strength were tested for statistical significance. Results: In total, 21 patients (mean age 52.6 ± 9.4 years; 59.1% male) were included in the study. In 12 cases (54.5%) an allograft and in 9 cases (45.5%) a xenograft was used. At follow-up (33.6 ± 7.1 months), a significant improvement of the ASES Score (38.0 [interquartile range 21.5-59.0] vs. 70.0 [62.5-95.0]; p < 0.001) and the SSV (70 [50-80] vs. 95 [77.5-100]; p < 0.004) as well as a significant reduction in pain (VAS for pain 6 [4.0-8.5] vs. 1 [0.0-2.0]; p < 0.001) were reported. Patients’ abduction (80? [45.0-100.0] vs. 145.07 [100.0-165.0]; p = 0.004) and flexion (90? [60.0-155.0] vs. 150? [95.0-170.0]; p = 0.017) ROM significantly improved, whereas external rotation ROM did not change significantly (p = 0.775).

Category: Shoulder - Rotator Cuff

**The Change in Shoulder Muscle Strength After Superior Capsule Reconstruction for Reinforcement of Arthroscopic Rotator Cuff Repair**

Abstract ID# 22447
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Summary: Superior capsule reconstruction for reinforcement prevents postoperative retear of the repaired rotator cuff tendon and improves shoulder muscle strength.

Data: