Background: Arthroscopic rotator cuff repair (ARCR) is a useful surgical procedure for rotator cuff tears. However, clinical outcomes and shoulder muscle strength are impaired when retears occur after surgery. Recently, superior capsule reconstruction for reinforcement of arthroscopic rotator cuff repair (SCRR) has been introduced to prevent retear after ARCR for degenerated rotator cuff tears. However, it remains unclear how much shoulder muscle strength recover after SCRR. The objective of this study was to investigate the changes in shoulder muscle strength after SCRR in patients with reparable but degenerated rotator cuff tears.

Methods: We retrospectively studied twenty patients (mean age of 68.2 years) with degenerated rotator cuff tears (19 medium and one large tears, the Goutallier grade of the supraspinatus was 2–3) who underwent SCRR using an autograft of fascia lata. Shoulder muscle strength, Japanese Orthopaedic Association (JOA) score, and shoulder pain using Visual Analog Scale (VAS) were evaluated before and at the final follow-up (mean, 23.3 months; range, 12–62 months). Shoulder muscle strength in abduction (at full-can position and at 90 degrees of shoulder abduction position), external and internal rotation at side were measured using digital handheld dynamometer (microFET2; Hoggan Scientific). Muscle strength in the affected shoulder was calculated as a percentage of that in the asymptomatic contralateral shoulder. The postoperative cuff integrity was evaluated by magnetic resonance imaging or ultrasound. Results: In this study, all 20 patients had no retear at the final follow-up. All shoulder muscles strength significantly increased after SCRR (abduction strength at full-can position, 46% preoperatively to 87% in the affected shoulder was calculated as a percentage of that in the asymptomatic abduction position), external and internal rotation at side were measured using muscle strength in abduction (at full-can position and at 90 degrees of shoulder abduction position), external and internal rotation at side were measured using digital handheld dynamometer (microFET2; Hoggan Scientific).

In both transverse and longitudinal orientations. Correlations between tendon vascular signal and age were assessed for asymptomatic subjects using a Pearson’s correlation coefficient. Differences between asymptomatic, tear, and repair cohorts and between readers were compared using a two-way ANOVA statistical test with a Tukey post-hoc analysis. RESULTS: There was significantly greater vascular signal in the longitudinal direction of torn supraspinatus (p = 0.036, Figures 1 and 2) and biceps tendons (p = 0.002, Figure 1) compared to asymptomatic and post-operative tendons. There were no differences between groups when vascularity was measured in the transverse direction (pS = 0.728, biceps p = 0.264). Correlations could not be found between the age of asymptomatic participants and the vascular signal within the SSP (R = 0.1732, p = 0.5063) and LHB (R = −0.3594, p = 0.1566) in the longitudinal direction, nor in the transverse direction for the SSP (R = −0.2903, p = 0.2583) or LHB (R = 0.2498, p = 0.3335). DISCUSSION: There was minimal vascular signal within asymptomatic tendons. The vascular signal increased in individuals with unrepaird SSP tears. Approximately 4-8 months following SSP repair and biceps tenodesis, tendon vascularity was not significantly different from asymptomatic tendons. Overall, results suggest that ultrasound techniques that evaluate tendon microvasculature in the absence of contrast agents may represent a low-risk and reliable method to monitor rotator cuff tendons following injury and during recovery. Further investigation will examine if the increased vascularity in the torn state could be a potential target for medication to increase healing rates. SIGNIFICANCE/RELEVANCE: Ultrasound examination provides a low-risk method of examining microvascular changes seen in tendons after injury and during recovery. This study investigates the potential for utilization in future treatment and recovery monitoring.

Category: Shoulder - Rotator Cuff

Outcome Comparison Between Arthroscopic Repair Of Full-Thickness Rotator Cuff Tear In Workers’ Compensation And Non-Workers’ Compensation Patients: Special Counseling Is Required

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Summary:
WC patients are on average 8 years younger than non-WC patients but have lower clinical outcome scores at week 26 compared to non-WC patients. Paradoxically however, WC patients have better healing with inferior retear rates and therefore, it is speculated, a better long-term prognosis. This result is helpful in the counselling of these patients and the formation of rehabilitation plans.

Data:
Introduction: Rotator cuff tears (RCTs) are significantly more common in manual workers referred to as workers’ compensation patients (WC), especially those involved in repetitive overarm lifting compared to the general population. RCTs are therefore a burden on the health care system as well as the manual workers, who are cared for under the WC insurance. The purpose of this study was to compare the functional outcome and retear rate of arthroscopic repair of full-thickness rotator cuff tear (FTRCT) in WC compared to non-WC patients. Methods: A total of 301 patients with FTRCT were included. 243 non-WC patients and 58 WC patients that required an arthroscopic rotator cuff repair between 2012 and 2020 with completed serial ultrasound examinations at weeks 6, 12, and 26 post-operatively were included. The time point for examination of cuff integrity was six months, based on the rotator cuff repair healing studies. Functional clinical scores were assessed by Constant score, Western Ontario Rotator Cuff Index (WORC), and Oxford score. Details were retrieved from the Socrates Orthopaedic Outcomes Software database. Surgical procedures were performed by the same experienced senior surgeon (MH). All patients had undergone an arthroscopic suture bridge repair technique. Results: Statistically, a significant difference was observed between the mean age of patients. 63 years ± 8.28 for the non-WC group and 55 years ± 7.52 for the WC group (p=0.001). No differences in the grade of tendinopathy were observed between both groups. Clinical outcomes were significantly improved at week 26 of all three scores (p<0.05) compared to preoperative scores in both groups. WC patients have statistically significant inferior Total Oxford Scores and WORC Total score preoperatively, at week 12 and at week 26 compared with non-WC patients (p<0.05). No differences between preoperatively Constant Scores were observed between both groups. Although subjective Constant score was statistically significantly lower in the WC group (15.69 ± 7.5 vs 18.51 ± 6.5 p<0.05). The Constant score at week 26 reflected statistically significantly improved scores at week 26 compared to week 6.

Category: Shoulder - Rotator Cuff

Ultrasound Detects Increased Vascularity Following Rotator Cuff Tears Compared to Asymptomatic and Repaired Rotator Cuff Tendons

Abstract ID: 22835
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Summary:
Ultrasound examination provides a low-risk method of examining microvascular changes seen in tendons after injury and during recovery. This study investigates the potential for utilization in future treatment and recovery monitoring.

Data:
INTRODUCTION: Tears to the rotator cuff tendons are among the most common clinical tendon complications in the aging population [1]. Tendons are dense, highly organized, and relatively avascular tissues; however, tendon structural integrity and vascularity decrease with age and may be related to increased injury risk with age [1-3]. Further, tendon vascularity may change in the presence of tendon pathology consistent with acute inflammatory and healing processes such as in response to rotator cuff tears [4,5]. The aim of this study is to examine the microvascular nature of the supraspinatus tendon (SSP) and long head of the biceps tendon (LHBT) using an ultrasound technique for superf microvascular imaging (SMI) in asymptomatic, torn, and repaired rotator cuff tendons. METHODS: This prospective study was approved by the institutional IRB and included 18 volunteers with asymptomatic shoulders (55 ± 18 yr BMI 22.6 ± 3.0 kg/m2, 7 males), 6 with an unrepairt rotator cuff tear involving the SSP (64 ± 3 yr, BMI 24.6 ± 4.1 kg/m2, 5 males, mean 28 months since tear), and 6 who had undergone a rotator cuff repair and biceps tenodesis surgery at least 4 months prior (57 ± 10 yr, BMI 25.5 ± 1.5 kg/m2, 5 males, mean 7 months since repair). An ultrasound examination was performed using an Aploio i800 system and an 11RL5LX linear array transducer (PLI-1205B9S/PS, Canon Medical Systems, Inc.). Two orthopedic surgeons with 6 years of experience with musculoskeletal ultrasonography measured microvasculature in the SSP and proximal LHBT with the SMI mode. The area of the vascular signal (cm2) within the tendons was recorded.