Abstracts

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Summary:
LTTT is a suitable salvage procedure for any degree of fatty infiltration of teres minor, and should be strongly considered as an alternate procedure to latissimus dorsi tendon transfer in patients with high grade teres minor fatty infiltration.

Data:
Introduction: Surgical management of massive irreparable rotator cuff tears has increasingly used salvage procedures such as tendon transfers to preserve the glenohumeral articulation in young patients. Appropriate patient selection for tendon transfers is crucial to surgical success, yet there is a paucity of evidence investigating factors that lead to improved post-operative outcomes. Success of latissimus dorsi tendon transfer has been linked to a low level of fatty infiltration of the teres minor muscle belly. However, the effect of teres minor fatty infiltration has not been studied in newer surgical techniques such as the lower trapezius tendon transfer (LTTT). This study aims to correlate post-operative outcomes of LTTT in massive irreparable rotator cuff tears to the degree of fatty infiltration of teres minor. Materials & Methods: This is a prospective longitudinal observational study. All patients with massive rotator cuff tears undergoing arthroscopic assisted LTTT (as previously described) by a single fellowship trained upper extremity surgeon were screened. The research coordinator undertook the consenting process if the patient agreed to be approached for the study. For all consented patients, fatty infiltration of teres minor was graded using the Goutallier classification based on pre-operative MRI by two orthopaedic surgeons not involved in performing the surgery. Two groups were created based on teres minor fatty infiltration: Group A included Grades 0 and 1 (no or little fatty infiltration) and Group B included Grades 2 to 4 (moderate to severe fatty infiltration). Participants completed a demographic form, and the SANE score and a satisfaction questionnaire were completed at pre-, 12- and/or 24-months post-operative. At all study time points, range of motion and isometric strength of forward elevation, abduction, and external rotation (ER) were measured by a research athletic therapist blind to Goutallier grade. Lag sign test was performed. Between group comparisons were performed using independent t-tests assuming unequal variance and pre- vs post-operative comparisons were performed for each group using paired t-tests. Rate of external rotation (ER) lag sign was compared between groups using Fisher’s exact test. Significance was defined as p < 0.05. Results: Twenty-six patients met the study inclusion criteria, with 18 patients included in Group A and 8 in Group B. There were no differences between groups with respect to pre-operative SANE score, degrees of active forward elevation, and degrees of active ER. Eight of 18 patients (44.4 %) in Group A had an ER lag sign, compared to 5 of 8 patients (62.5%) in Group B, but this was not statistically significant (p = 0.672). Significant post-operative improvements in SANE score were found in both groups with no differences between groups. Pre-operative ER strength of the affected arm with the arm adducted was significantly different in Group A (3.9kg) versus Group B (0.58kg; p = 0.011; Figure 1). However, ER strength was similar post-operatively (p = 0.587). Discussion: Lower trapezius tendon transfer provides in-phase motor activity and anatomic line of pull to the infraspinatus and teres minor muscles. In our study, patients with any degree of fatty infiltration of teres minor benefited from LTTT and experienced improvement in patient reported outcomes. Patients with moderate to severe teres minor fatty infiltration (Group B) had lower baseline ER strength, but this difference was no longer evident post-operatively. Although overall patient numbers in this study are small given the rarity of this condition and procedure, these outcomes suggest that LTTT provides significant benefit to patients, independent of the degree of fatty infiltration to teres minor. This is in contrast to the latissimus dorsi tendon transfer, which is less successful in patients with moderate to severe teres minor fatty infiltration. Taken together, LTTT is a suitable salvage procedure for any degree of fatty infiltration of teres minor, and should be strongly considered as an alternate procedure to latissimus dorsi tendon transfer in patients with high grade teres minor fatty infiltration.

Category: Shoulder - Rotator Cuff

Effect of Polydeoxyribonucleotide on Tendon Healing and Fatty Degeneration in Arthroscopic Rotator Cuff Repair: A Randomized Controlled Trial

Abstract ID# 22462
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Summary:
PDRN may have possibility to improve tendon healing and decrease fatty degeneration after arthroscopic repair of rotator cuff tear associated with growth factor.

Data:
Introduction: Polydeoxyribonucleotide (PDRN) has been recently used as a tissue regeneration activator. This study was performed to explore the effects of PDRN on tendon healing and reversal of fatty degeneration in arthroscopic rotator cuff repair Materials and Methods: Sixty patients with rotator cuff tears who had undergone arthroscopic rotator cuff repair were enrolled in this single center, double-blinded randomized controlled trial study. Thirty patients were randomly allocated to group 1 and received PDRN injection to the repair site during the surgery. The other 30 patients were allocated to group 2 and underwent saline injection. In out-patient department, all the patients in the two groups were injected with the same materials to the repair site under ultrasound guidance at 2 weeks after surgery. The Visual analog scale (VAS) for pain, American Shoulder and Elbow Surgeon’s score (ASES), Constant score, range of motion and muscle power were checked at preoperatively and until postoperative 1 year. Follow-up MRI was checked at postoperative 6 month. The mean plasma levels of vascular endothelial growth factor (VEGF), fibroblast growth factor (FGF) and insulin-like growth factor (IGF) were checked until postoperative 6 months. Results: In the two groups, the overall functional outcomes improved after surgery. Group 1 showed a significant decreased VAS score at 16 weeks after surgery compared with that in groups 2 (P = 0.014). And group 1 showed a significant decreased fatty degeneration of supraspinatus and infraspinatus on follow-up MRI at 6 months after surgery (P = 0.028 and P = 0.030). On the follow-up MRI, group 2 showed higher retear rate than group 1, but this difference did not reach a statistical significance (G1: G2 = 4:8; P = 0.333). Group 1 showed a significantly higher mean plasma FGF level postoperative 1 hour and 6 weeks than group 2 (15.5±11.1; P = 0.008, 7.9±6.0; P = 0.001). Conclusion: PDRN may have possi- bility to improve tendon healing and decrease fatty degeneration after arthroscopic repair of rotator cuff tear associated with growth factor.

Category: Shoulder - Rotator Cuff

Photobiomodulation Home-Use Device Reduces Pain and Improves Quality of Life Post Arthroscopic Rotator Cuff Repair - A Double-Blind, Sham-Controlled, Randomized Clinical Trial

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Summary:
Self-applied photobiomodulation significantly accelerates reduction in pain and improvement in quality of life following rotator cuff arthroscopic repair.

Data:
Objective: The rehabilitation period following rotator cuff arthroscopic surgery (RCAS) is characterized with significant pain and reduced quality of life (QOL). The current study was designed to evaluate the efficacy of self-applied photobiomodulation (PBM), a non-ionizing, non-thermal red to near-infrared optical irradiation, during the first 6 months post-RCAS. Methods: This was a prospective, double-blind, sham-controlled, randomized, clinical trial (NCT04593342). Patients (n = 50, Age 55±7yo, Male:Female 29:21) that underwent primary RCAS were randomized to receive active (n = 22) or sham (n = 28) B-Cure Laser PBM devices (Erica Carmel, Haifa, Israel) and to self-apply the treatments (808nm, 15minutes, 16.5J/cm2) at home addinally to standard care. Outcomes
including shoulder function by the Constant-Murley Score (CMS); Subjective pain by visual analogue scale (VAS score=[0–none]-100[ intolerable], and QOL by SF-12, were collected before the surgery (Baseline) and at follow-ups 1-3-and-6 months’ post-RCAS (FU1, FU3, FU6, FU-6m). The %patients achieving minimal clinical important difference ((MCID) =15) and patient acceptable symptom state ((PASS) = 17) was calculated. Groups were compared by superiority 2-sample t-test and chi-square. Results: Baseline scores were not significantly different between groups. As expected, post-RCAS, the CMS improved over time and was similar for both groups. However, compared to sham, PBM significantly accelerated the reduction in subjective pain at 3 and 6 months (Change over baseline in VAS score, mean±SD, PBV vs Sham: FU3: 32±33- vs 16±27, p = 0.040; FU6: 41±36- vs 23±26, p = 0.038), with a significantly higher proportion of patients achieving MCID at 3 months (76% vs-48%, p= 0.027) and PASS at 6 months (48% vs-23%, p = 0.044). PBM also significantly improved the reported QOL at 6 months (physical component 68.8 vs 12.5- vs 0.48, p = 0.031; Mental component 8.5±9.1- vs 2.2± 12, p = 0.032). Discussion: Self-applied photobiomodulation was found to significantly accelerate reduction in pain and improvement in quality of life following rotator cuff arthroscopic surgery. These findings may indicate the usefulness of photobiomodulation for rehabilitation in other orthopedic surgeries. Sponsored by Erica Carmel Ltd.

Category: Shoulder - Rotator Cuff

Short-term Outcomes of an “All-in-One” Interpositional Scaffold Anchor Implant for Rotator Cuff Tendon Repair: A Prospective Multicenter Study

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Summary: The LTT showed significant improvement in active ROM and SSV and outperformed the LDT in these categories

Data: Introduction: The aim of this study is the analysis of a cohort of patients who have been treated due to a non-reparable postero-superior rotator cuff (RC) tear with an arthroscopic assisted lower trapezius transfer (LTT). This cohort will be compared to a cohort of patients having been treated for the same pathology with Latissimus dorsi Transfer (LDT). Biomechanical studies have shown a better abduction and external rotation moment arm for the LTT in comparison to the LDT. Therefore, the hypothesis of this study was that the LTT would provide better functional results in comparison to the LDT. Methods: Between 2013 and 2020 50 patients were treated with LDT and between 2018 and 2020 21 with LTT. For better comparability of the patient groups, a matched pairs analysis was carried out, in which 17 statistical pairs (34 patients: 30 males, 4 females; age (LDT): 55-6 years, age (aLTT): 55+-7 years) could be included. Matching criteria were same sex, age -+3 years, tear size according to Gbangman -+1, and retraction size according to Patte -+1. The LDT was performed in a double incision technique and the LTT was performed arthroscopically assisted using an autologous semitendinosus interposition transplant. Clinical evaluation was included passive and active ROM and Constant-Score (CS), DASH, WORC, SSV, ADLIER, OSS. Results: At final follow up of 43+-18 months (LDT) vs 18+-7 months (LTT) the CS improved in the LDT from 42 to 57 points (p<0.01) and in the LDT group from 48 to 63 points (p<0.01). Mean Flexion improved in the LDT group from 112 to 134 (n.s.) and mean abduction from 112 to 122 (n.s.); in the LTT group Flexion improved from 81 to 107 (p<0.01) and abduction from 112 to 156 (p<0.001). Mean external rotation improved in the LDT group from 19 to 29 (n.s.) and 29 to 44 for the LTT (p<0.05). Score results were: CS: 64 (LDT) vs 70 (LTT) (n.s.); DASH 19 (LDT) vs 12 (LTT) (n.s.); WORC 77 (LDT) vs 77 (LTT) (n.s.); SSV 75% (LDT) vs 77% (LTT) (n.s.); ADLIER 33 (LDT) vs 33 (LTT) (n.s.), and OSS 23 (LDT) vs 19 (aLTT) (n.s.). Conclusion: Improved score results and functional improvement was seen in both groups. The LTT showed significant improvement in active ROM and outperformed the LDT in these categories. However, longer follow up data and randomized controlled studies are necessary in order to further evaluate the clinical value of both methods.

Category: Shoulder - Rotator Cuff

Leukocyte-Poor Platelet Rich Plasma As An Adjuvant Of Arthroscopic Rotator Cuff Repairs Reduces Retears Rates But Does Not Improve Functional Outcomes A Double-Blind Randomized Controlled Trial

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