Paper #1 * POSTOPERATIVE RECOVERY COMPARISONS OF LATISSIMUS DORSI TRANSFER TO LOWER TRAPEZIUS TRANSFER FOR THE TREATMENT OF MASSIVE ROTATOR CUFF TEARS

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Background: Massive irreparable posterosuperior rotator cuff tears pose a challenging problem and the optimal treatment remains controversial. In younger patients with external rotation lag signs, dynamic reconstruction using a tendon transfer is preferred. Open Latissimus dorsi (LD) tendon transfer has demonstrated excellent long-term outcomes while arthroscopic techniques have demonstrated reliable short-term outcomes. In recent years, arthroscopic lower trapezius (LT) tendon transfer has been described but no clinical outcomes have been reported to date. The purpose of this study is to compare the early post-operative recovery following open and arthroscopic LD transfer to arthroscopic LT tendon transfer for patients with massive irreparable posterosuperior rotator cuff pathology.

Methods: A multicenter retrospective analysis comparing the post-operative recovery outcomes after either an open or arthroscopic LD transfer and arthroscopic LT transfers by one of two high volume, fellowship trained surgeons was performed. Patients were included who had a minimum of 6 months follow-up. Preoperative and postoperative (2 weeks, 6 weeks, 3 months, 6 months, 1 year and 2 year) time points were evaluated. Outcomes measures included Visual Analog Pain Scale (VAS), American Shoulder and Elbow Surgeons (ASES) Shoulder Function Score, ASES Shoulder Index Score and SANE Score. Overall, 12 patients underwent open LD transfer (9 male, 3 female), 16 underwent arthroscopic LD transfer (13 male, 3 female) and 8 underwent an arthroscopic LT transfer (5 male, 3 female). The mean age for open LD, arthroscopic LD, and arthroscopic LT was 56.5, 56.9, and 53.3, respectively. The mean duration of follow-up for open LD, arthroscopic LD, and arthroscopic LT was 17.7, 7.9, and 11.3 months, respectively. The overall duration of follow-up was 12 months.

Results: The postoperative recovery curves are displayed in Figure 1. Arthroscopic LD and LT transfers had significantly improved post-operative forward flexion ($p<0.04$) and external rotation ($p<0.0001$) while open LD transfer had significantly improved external rotation ($p=0.0034$). Arthroscopic LD and LT transfers had significantly reduced pain scores starting at 6 months ($p=0.03$ $p=0.05$) with open LD starting at one year ($p=0.008$) when compared to pre-operative measurements. Arthroscopic LD and LT transfers improved ASES Shoulder Function scores starting at one year ($p<0.03$). Arthroscopic LD, open LD, and arthroscopic LT had significantly improved SANE scores at 1 year ($p<0.01$). In comparing the post-operative outcomes, arthroscopic LT demonstrated significantly improved ASES shoulder index and VAS while arthroscopic LD transfer had improved ASES shoulder index compared to Open LD at 1 year ($p<0.03$). There was a total of 4 (11.4%) complications. These included an infection for *P. acnes* and an axillary nerve injury for arthroscopic LD transfers as well as a complex regional pain syndrome and a post-surgical adhesive capsulitis for open LD transfers.

Conclusions: Open latissimus dorsi, arthroscopic latissimus dorsi and arthroscopic lower trapezius transfer all provided significant improvement in pain and function at short-term follow-up. Arthroscopic LT tendon transfer provided earlier improvements in pain and sustained improvements in function when compared to open LD transfer and equivalence when compared to arthroscopic LD transfer. While this study is limited in its sample size it demonstrates promising early outcomes and safety for lower trapezius transfer. Further comparative studies are needed to evaluate the optimal conditions for using each of these treatments in the management of massive rotator cuff pathology.

Paper #2 OUTCOME OF ARTHROSCOPICALLY ASSISTED LOWER TRAPEZIUS TRANSFER TO RECONSTRUCT MASSIVE IRREPARABLE POSTERIOR-SUPERIOR ROTATOR CUFF TEARS

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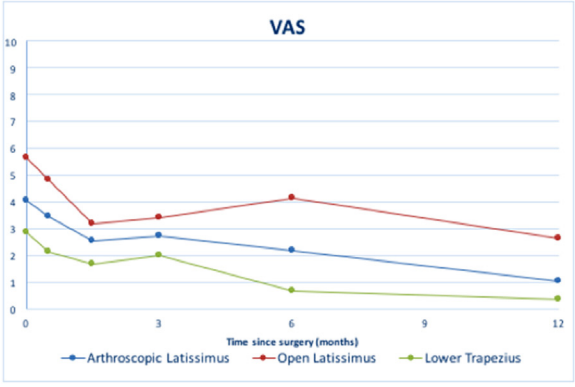
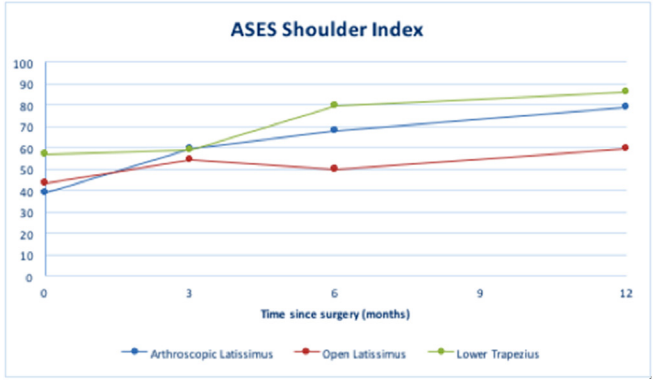
Background: Reasonable outcomes has been reported with indirect open lower trapezius transfer extended with an Achilles





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tendon allograft to reconstruct irreparable posterior-superior rotator cuff tears. Techniques have been developed to perform this procedure arthroscopically. However, the outcome of arthroscopically assisted lower trapezius transfer is largely unknown. The purpose of this study is to report the outcome of arthroscopically assisted lower trapezius transfer to reconstruct irreparable posterior-superior rotator cuff tear.

Methods: Forty-one consecutive patients with irreparable posterior-superior rotator cuff tears who underwent an arthroscopically assisted transfer of the lower trapezius transfer were included in this study. There was an associated repairable tear of the subscapularis tendon in 25 shoulders. The average age of the patients was 52 (range, 37-71) years and average follow-up was 13 months (range, 6-17 months). Nineteen patients had true pseudoparalysis of the shoulder on preoperative examination. Outcome measures included visual pain analogue score (VAS), range of motion (ROM), subjective shoulder value (SSV), and Disabilities of the Arm, Shoulder and Hand (DASH) score.

Results: Thirty-seven patients had significant improvement of all outcome scores: VAS, SSV and DASH. At most recent follow-up, range of motion averaged: 133° flexion, 95° abduction, and 47° external rotation. Outcome was not affected by the presence of a subscapularis tear. However, three patients who had preoperative arthritic changes of the shoulder, 2 with Hamada 2 and one Hamada 3, had persistent pain and limited range of motion of the shoulder after surgery, and 2 of them underwent reverse shoulder arthroplasty. One patient had significant improvement of pain but with no improvement of motion, and elected not to have further surgery. Two additional patients had a traumatic rupture of the transfer as result of fall (at 5 and 8 months post op). One underwent revision arthroscopic repair and did well after surgery, and the other had good pain relief but recurrent weakness and limited range of motion, and elected not to have a revision surgery.

Conclusions: Arthroscopic assisted lower trapezius transfer may lead to a good outcome in patients with massive irreparable posterior-superior rotator cuff tears, including patients with pseudoparalysis. The presence of an associated reparable subscapularis tear did not affect the outcome. However, the presence of radiographic degenerative changes did lead to a worse outcome and the need for revision to reverse shoulder arthroplasty.

Paper #3 * LATARJET PROCEDURE VERSUS ILIAC-CREST BONE GRAFT TRANSFER FOR TREATMENT OF ANTERIOR SHOULDER INSTABILITY WITH GLENOID BONE LOSS: A PROSPECTIVE RANDOMIZED TRIAL

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Introduction: The Latarjet and iliac-crest bone graft transfer (ICBGT) procedure are competing treatment options for anterior shoulder instability with glenoid bone loss. Despite the fact that several clinical, radiological, and biomechanical studies have shown both the advantages and disadvantages for either technique no prospective randomized clincial outcome trials are currently available. Goal of this study was to compare the clincial and radiological outcome of the Latarjet and the ICBGT procedure by means of a prospective randomized trial. The hypothesis of this study was that the Latarjet and ICBGT procedure for treatment of anterior shoulder instability with glenoid bone loss provide the same clinical and radiological outcome.

Methods: In a bi-centric prospective randomized study 60 patients with anterior shoulder instability and glenoid bone loss were included and randomly allocated with a 1:1 ratio to either an open Latarjet or open ICBGT procedure. Surgeries were performed by two experienced surgeons at each center with experience in both techniques. Exclusion criteria were unwillingness to participate in the randomization process, pre-existing ipsilateral shoulder pathology, previous ipsilateral shoulder surgery except open or arthroscopic Bankart repair, previous infection, neuro-muscular disease, lack of compliance, problems with attending the regular follow-ups, and chronic alcohol or drug abuse. Clinical evaluation was completed before surgery as well as 6, 12, and 24 months after surgery including the Western Ontario Shoulder Instability Index (WOSI; main outcome measurement), Rowe Score, Subjective Shoulder Value (SSV), pain level, satisfaction level, work and sports impairment as well as assessment of instability, range of motion and strength. Additionally, adverse events were prospectively recorded. Radiographic evaluation included preoperative, postoperative, and follow-up CT scans with 3D reconstruction used for longitudinal evaluation of the changes of glenoid diameter, area, depth, and version as well as the glenoid track. The final follow-up rate was 90.0%. Power analysis and online trial registration were accomplished prior to the beginning of the study and approval of the local ethical committees was obtained.

Results: The WOSI, Rowe Score, SSV, satisfaction level, pain level, work and sports impairment showed no significant difference between both groups ($p>0.05$). Range of motion showed no significant difference except for significantly diminished internal rotation in the Latarjet group at every follow-up time-point ($p<0.05$). Strength in abduction, internal rotation, and external rotation showed no significant difference between both groups ($p>0.05$). No dislocation was recorded after either type of surgery within the monitored time period. Two patients in the ICBGT and one patient in the Latarjet group experienced a single postoperative traumatic subluxation event. Complications in the ICBGT group included eight paresthesias and two cases of superficial wound infection at the donor site, as well as one graft fracture one year after surgery due to a bycicle fall with subsequent graft re-union and without residual subjective or objective instability. Complications in the Latarjet group included one pseudoarthrosis of the graft without clinical consequence, one case of screw irritation requiring revision surgery, and one case of postoperative hematoma. The CT scan analysis revealed a larger glenoid augmentation effect of the ICBGT which, however, was attenuated at follow-up due to bony remodeling.

Conclusion: The Latarjet and ICBGT procedure for treatment of anterior shoulder instability with glenoid bone loss showed no difference in the clinical and radiological outcome except for a significantly worse internal rotation capacity in the Latarjet group and frequently noted donor site sensory disturbances in the ICBGT group.

*Indicates paper nominated for the Neer Award

Paper #4 CLINICAL AND RADIOLOGICAL OUTCOMES AFTER ARTHROSCOPIC BANKART REPAIR USING THE ALL-SUTURE ANCHORS: COMPARISON WITH THE BIODEGRADABLE SUTURE ANCHORS

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Purpose: An all-suture anchor has been introduced to make it possible to place anchors with a smaller diameter, which allows to preserve more glenoid bone. Moreover, due to the softness of all-suture anchor, the curved guide for predrilling and anchor insertion is available and allowing the surgeons to maintain acceptable angle of