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Upper extremity

Arthroscopy, Volume 37, Issue 02, p 450-456

Does an “Off-Track” Hill-Sachs Lesion That Is Misclassified as “Non-Engaging” Affect Outcomes From Bankart Repair Alone Compared With Bankart Repair Combined With Remplissage?

Lee, Y.-J., Kim, C., Kim, S.-J., Yoon, T.-H., Cho, J.-Y., & Chun, Y.-M.

https://doi.org/10.1016/j.arthro.2020.09.037

Purpose
To determine how intraoperative assessment (engagement test) may affect recurrent dislocation rate and to compare the clinical outcomes, recurrence rates, and presence of on-/off-track conditions between cases that received arthroscopic Bankart repair alone (nonengaged Hill-Sachs lesion) and Bankart repair with remplissage (engaged Hill-Sachs lesion).

Methods
We retrospectively reviewed 213 patients who underwent arthroscopic Bankart repair alone (186 patients with nonengaging lesions, group A) or with remplissage (27 patients with engaging lesion, group B) for recurrent anterior shoulder instability with <25% glenoid bone defect. The presence of an engaging Hill-Sachs lesion was determined during arthroscopic evaluation. On-track or off-track lesions were assessed retrospectively from preoperative 3-dimensional (3D) computed tomography (CT).

Results
Mean glenoid bone defect was 13.7% in group A and 20.7% in group B ($P < .001$). Off-track lesions were identified in 8.1% (15/186) and 100% (27/27) in group B. At the final follow-up (minimum 2 years; mean follow-up periods after surgery of 50.1 months in group A and 47.7 months in group B), there were no significant differences in shoulder functional scores and recurrence rates between groups, despite improvement after surgery. In the off-track lesion (group A-1: nonengaging but off-track lesion), recurrence instability occurred in 9 patients (60%, 9/15). Also, comparing group A-1 and group B, we noted significant differences in shoulder functional scores and recurrence rates ($P < .001$).

Conclusion
Of 186 patients, 8.1% with nonengaging Hill-Sachs lesions during direct arthroscopic examination under anesthesia actually demonstrated off-track lesions on preoperative 3D CT scans retrospectively, with 60% experiencing recurrent instability. Intraoperative manual assessment for Hill-Sachs engagement was inferior to 3D CT scan in establishing the presence of off-track defects.

Level of evidence
III, retrospective comparative study

BACK

Patient Factors Associated With Clinical Failure Following Arthroscopic Superior Capsular Reconstruction

Gilat, R., Haunschild, E. D., Williams, B. T., Fu, M. C., Garrigues, G. E., Romeo, A., … Cole, B. J.

https://doi.org/10.1016/j.arthro.2020.09.038

Purpose
To identify demographic, clinical, and radiographic factors associated with failure after superior capsular reconstruction (SCR).

Methods
Prospectively collected data were analyzed from patients who underwent SCR using a decellularized dermal allograft for an irreparable rotator cuff tear. Demographic characteristics, radiographic findings, concomitant procedures, and patient-reported outcomes (PROs) were recorded. Failure was defined by ≥1 of the following criteria: (1) conversion to reverse total shoulder arthroplasty (RTSA), (2) a decrease in 1-year postoperative shoulder-specific PROs compared with preoperative scores, or (3) patient reports at final follow-up that the shoulder was in a worse condition than before surgery. Preoperative variables were compared between patients meeting the criteria for clinical failure and those who did not.

Results
Fifty-four patients (mean age 56.3 ± 5.8 years, range 45 to 70) who underwent SCR, with minimum 1-year follow-up, were included in the analysis. Mean follow-up after surgery was 24 months (range 12 to 53). Eleven patients (20.4%) met criteria for clinical failure. Of the 11, 8 reported decreased American Shoulder and Elbow Surgeons (ASES) or Constant scores or indicated that the operative shoulder was in a worse condition than before surgery. Three patients underwent RTSA in the 6 to 12 months after SCR. Female sex and the presence of a subscapularis tear were associated with failure (P = .023 and P = .029, respectively). A trend toward greater body mass index (BMI), lower preoperative forward flexion, and lower preoperative acromiohumeral distance (AHD) was found in patients with clinical failure (P = .075, P = .088, and P = .081, respectively). No other variable included in the analysis was significantly associated with failure.

Conclusion
The proportions of female patients and those with subscapularis tear were greater among patients with clinical failure after SCR. Greater BMI, lower preoperative forward flexion, and lower preoperative AHD trended toward association with clinical failure of SCR.

Level of Evidence
4, case series.

BACK

The Shoulder Trans-pectoralis Arthroscopic Portal Is a Safe Approach to the Arthroscopic Latarjet Procedure: A Cadaveric Analysis

Dunn, A. S. M., Petterson, S. C., & Plancher, K. D.

https://doi.org/10.1016/j.arthro.2020.09.044

Purpose
To assess the proximity of neurovascular structures in a layered approach during medial portal placement and determine standardized measurements for establishing a portal medial to the coracoid used in arthroscopic Latarjet-type procedures.

Methods
Twelve shoulders (6 right and 6 left) in 6 fresh frozen cadaveric torsos were mounted in the modified beach-chair position. A standard posterior portal and 3 anterior portals—central, lateral, and medial—were used. A long spinal needle was placed along the path of the medial portal to the lateral tip of the coracoid, superficial to the conjoined tendon and pectoralis minor. A second long spinal needle was directed toward the medial base of the coracoid, penetrating the pectoralis minor. Superficial and deep plane dissections were performed, and distances to surrounding neurovascular structures were recorded.

Results
In the superficial plane, the cephalic vein and lateral pectoral nerve were located a mean distance (± standard deviation) of 4.6 ± 1.9 mm and 9.4 ± 2.6 mm from the spinal needle, respectively. In the deep plane, the axillary nerve was 24.9 ± 7.4 mm from the needle; the lateral cord of the brachial plexus, 25.5 ± 8.1 mm; the axillary artery, 34.1 ± 6.0 mm; and the musculocutaneous nerve, 42.2 ± 9.2 mm. The portal was consistently established 45.0 to 50.0 mm distal and 30.0 to 35.0 mm medial to the coracoid, which was a minimum distance of 10 mm to the lateral pectoral nerve.

Conclusions
In a cadaveric model, the creation of a medial trans–pectoralis major portal used in the arthroscopic Bankart-Bristow-Latarjet procedure can avoid compromise of vital neurovascular structures, alleviating concerns of creating a portal medial to the coracoid. Portal placement 45.0 to 50.0 mm distal and 30.0 to 35.0 mm medial to the palpable tip of the coracoid process may be a safe approach to perform the arthroscopic Bankart-Bristow-Latarjet procedure.

Clinical Relevance
Creation of a portal medial to the level of the coracoid may pose a risk to neurovascular structures. This cadaveric study establishes a working zone for medial trans-pectoralis portal placement, which avoids vital neurovascular structures, and provides standardized measurements for establishing this portal for use in the arthroscopic Bankart-Bristow-Latarjet procedure.

BACK

Superior Capsular Reconstruction Using Dermal Allograft Is a Safe and Effective Treatment for Massive Irreparable Rotator Cuff Tears: 2-Year Clinical Outcomes

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https://doi.org/10.1016/j.arthro.2020.10.014

Purpose
To evaluate functional, symptomatic, and diagnostic imaging outcomes after arthroscopic superior capsular reconstruction (SCR) using dermal allograft in patients with massive irreparable rotator cuff tears.

Methods
From 2015 to 2017, this multicenter study retrospectively evaluated patients undergoing arthroscopic SCR for treatment of symptomatic massive rotator cuff tears. Study criteria included the presence of a massive irreparable rotator cuff tear with retraction to the glenoid without diffuse bipolar cartilage loss, Grade 4 or 5 Hamada classification, and subscapularis pathology that could not be addressed. All SCR procedures were performed with neutral abduction of the arm at the time of implantation. Outcome measures included visual analog pain scale (VAS) score, the American Shoulder and Elbow Surgeons (ASES) score, Single Assessment Numeric Evaluation (SANE) score, and active forward elevation (FE) through 2 years postoperatively. Imaging analyses included radiographs, ultrasound, and magnetic resonance imaging at 6 months and 1 year.

Results
Fourteen patients met all study criteria including required follow-up. There were statistically significant improvements in VAS pain (3.3-0.6, $P = .001$), ASES (55.0-86.5, $P < .0001$), SANE (33.1-71.5, $P < .0001$), and active FE (128-172, $P = .0005$) with mean follow-up of 2.1 years. Twelve patients (86%) met the minimum clinically important difference in VAS pain, ASES, and SANE. Thirteen grafts (93%) had ultrasonographic evidence for vascularity by 1 year postoperatively. There were 2 graft complications (14%) with one (7%) requiring revision to reverse total shoulder arthroplasty.

Conclusions
Arthroscopic SCR using dermal allograft can be a safe and effective treatment option for patients with massive irreparable rotator cuff tears with statistically significant improvements in VAS pain, ASES, SANE, and active FE at 2-years postoperatively, with 93% of grafts demonstrating vascularity at 1-year postoperatively. Neutral abduction of the arm at the time of implantation resulted in positive clinical outcomes and may decrease graft failure rate.

Level of Evidence
Level IV, case series.

BACK

Clinical Outcomes of Arthroscopic Suprascapular Nerve Decompression for Suprascapular Neuropathy

Philip-C. Nolte, MD, MA, Thomas E. Woolson, BS, Bryant P. Elrick, MSc., AnnaKatharina Tross, MD, Marilee P. Horan, MPH, Jonathan A. Godin, MD, MBA, Peter J. Millett, MD, MSc

https://doi.org/10.1016/j.arthro.2020.10.020

Purpose
To report clinical outcomes following arthroscopic suprascapular nerve (SSN) decompression for suprascapular neuropathy at the suprascapular and/or spinoglenoid notch in the absence of major concomitant pathology.

Methods
We retrospectively reviewed prospectively collected data of 19 patients who underwent SSN release at the suprascapular and/or spinoglenoid notch between April 2006 and August 2017 with ≥2 years of follow-up. Patients who underwent concomitant rotator cuff or labral repairs or had severe osteoarthritis were excluded. Pre- and postoperative strength and patient-reported outcomes were collected, including the American Shoulder and Elbow Surgeons (ASES), Single Assessment Numerical Evaluation (SANE), Quick Disabilities of the Arm, Shoulder, and Hand (QuickDASH), 12-item Short Form (SF-12), and satisfaction. Complications and revisions were recorded.

Results
At a mean final follow-up of 4.8 years, pre- to postoperative ASES (64.9 ± 18.7 versus 83.5 ± 23.1; P = .018), QuickDASH (28.7 ± 17.2 versus 12.7 ± 17.1; P = .028), SANE (64.3 ± 16.4 versus 80.8 ± 22.3; P = .034), and SF-12 PCS (41.1 ± 10.8 versus 52.3 ± 5.8; P = .007) scores all significantly improved. Median strength for external rotation improved significantly (4 [range 2 to 5] versus 5 [range 3 to 5]; P = .014). There was no statistically significant improvement in median strength for abduction (4 [range 3 to 5] versus 5 [5]; P = .059). Median postoperative satisfaction was 9 (range 1 to 10), with 8 patients (50%) rating satisfaction ≥9. No complications were observed, and no patients went on to revision surgery.

Conclusion
Arthroscopic SSN decompression for suprascapular neuropathy at the suprascapular and/or spinoglenoid notch in the absence of major concomitant glenohumeral pathology results in good functional outcomes with significant improvements from before to after surgery.

Level of Evidence
IV, therapeutic case series.

BACK

Arthroscopic Bankart Repair With Remplissage in Comparison to Bone Block Augmentation for Anterior Shoulder Instability With Bipolar Bone Loss: A Systematic Review

Gouveia, K., Abidi, S. K., Shamshoon, S., Gohal, C., Madden, K., Degen, R. M., … Khan, M.

https://doi.org/10.1016/j.arthro.2020.08.033

Purpose
The purpose of this systematic review is to examine the rates of postoperative recurrence of instability, functional outcomes, and complications after treatment with bone augmentation procedures or arthroscopic Bankart repair with remplissage for recurrent anterior shoulder instability in the setting of subcritical glenoid bone loss.

Methods
EMBASE, PubMed, and MEDLINE were searched from database inception until June 2019 for articles examining either bone block augmentation to the glenoid or Bankart repair with remplissage (BRR) in the setting of subcritical glenoid bone loss. Search and data extraction were performed by 2 reviewers independently and in duplicate. A separate analysis was done for comparative studies.

Results
Overall, 145 studies were identified, including 4 comparative studies. Across all studies, postoperative recurrence rates ranged from 0% to 42.8% for bone block augmentation and 0% to 15% for Bankart repair with remplissage. In comparative studies reporting subcritical glenoid bone loss, rates were 5.7% to 11.6% in the Latarjet group and 0% to 13.3% in the Bankart repair with remplissage group. However, in all studies reporting 10% to 15% mean glenoid bone loss, there was an increased rate of recurrent instability with arthroscopic soft tissue repair (6.1% to 13.2%) in comparison with bony augmentation (0% to 8.2%). Lastly, complication rates ranged from 0% to 66.7% for the bone block group and 0% to 2.3% for arthroscopic Bankart repair with remplissage.

Conclusion
Both bone block augmentation and Bankart repair with remplissage are effective treatment options for recurrent anterior shoulder instability in patients with bipolar bone loss but subcritical glenoid bone loss. Both have comparable functional outcomes, albeit bone block procedures carry an increased risk of complications. Arthroscopic BRR may be associated with a higher failure rate for preoperative glenoid bone loss >10%. Therefore, it may represent a stabilization procedure best suited for cases of recurrent anterior instability with glenoid bone loss <10% and the presence of a significant, off-track Hill-Sachs lesion.

Level of Evidence
Level IV, systematic review of Level II-IV studies.

BACK

Superior Capsular Reconstruction: A Systematic Review of Surgical Techniques and Clinical Outcomes

Gao, I., Sochacki, K. R., Freehill, M. T., Sherman, S. L., & Abrams, G. D.

https://doi.org/10.1016/j.arthro.2020.09.016

Purpose
To evaluate surgical techniques and clinical outcomes of arthroscopic superior capsular reconstruction (SCR) for the treatment of massive irreparable rotator cuff tears.

Methods
A systematic review was registered with PROSPERO and performed using PRISMA (Preferred Reporting Items for Systematic Reviews and Meta-analyses) guidelines. The PubMed, Scopus, and Cochrane databases were searched. Studies investigating SCR with reported surgical techniques were included. Animal studies, cadaveric studies, review studies, and letters to the editor were excluded. The technical aspects of the surgical techniques for SCR were analyzed in each article, which included graft type, glenoid fixation method, greater tuberosity fixation method, graft passage technique, suture management, margin convergence, concomitant procedures, and postoperative rehabilitation protocol. Clinical outcomes, when available, were also analyzed.

Results
We screened 365 articles, of which 29 described surgical techniques for SCR. According to the Modified Coleman Methodology Score, 24 articles were rated as poor (score < 55), 4 were rated as fair (score between 55 and 69), and 1 was rated as good (score between 70 and 84), with an average score of 25.8 ± 20.9. The most commonly performed technique for SCR used the following: an acellular dermal allograft, 2 biocomposite suture anchors for glenoid fixation, transosseous-equivalent double-row suture anchor fixation for greater tuberosity fixation with 2 biocomposite medial-row anchors and 2 biocomposite lateral-row anchors, the double-pulley technique combined with an arthroscopic grasper and/or pull suture to pass the graft into the shoulder, the performance of both anterior and posterior margin convergence, and a native rotator cuff repair when possible. Only 8 studies reported clinical outcomes, and they showed that SCR provides significant improvement in patient-reported outcomes, significant improvement in shoulder range of motion, variable graft failure rates, low complication rates, and variable reoperation rates. There were no studies comparing outcomes among the various surgical techniques.

Conclusions
Many surgical techniques exist for arthroscopic SCR. However, no superior technique was shown because there were no studies comparing clinical outcomes among these various techniques.

Level of Evidence
Level V, systematic review of Level III, IV, and V studies.

BACK

A Systematic Review of Arthroscopic Versus Open Debridement of the Arthritic Elbow`

Reid White, C. H., Ravi, V., Watson, J., Badhrinarayanan, S., & Phadnis, J.

https://doi.org/10.1016/j.arthro.2020.09.005

Purpose
To systematically review the available data with regard to clinical and functional outcomes of arthroscopic and open debridement for elbow arthritis to determine the complication rate with transition to arthroscopic surgery.

Methods
Using the Preferred Reporting Items for Systematic Reviews and Meta Analyses protocol, a systematic review was performed including studies reporting clinical and functional outcomes following open or arthroscopic debridement of elbow arthritis. The primary outcome measures analyzed were functional outcome (Mayo Elbow Performance Score), range of motion, and complication rate. Data were extracted for the whole group and then compared between the techniques using ranges and forest plots.

Results
In total, 39 level IV and 3 level III studies with 1097 elbows were eligible for inclusion; 684 elbows were treated using an open technique and 413 using an arthroscopic technique. Regarding functional outcome scores, mean Mayo Elbow Performance Score improved significantly with comparable magnitude of improvement in both groups (arthroscopic group: range 28-34, open group: range 25-31). Regarding range of motion, mean flexion–extension arc improved significantly in both groups (arthroscopic group: range 8-26°, open group: range 13-49°). The open group had a lower preoperative flexion–extension arc (range 63-96) in comparison with the arthroscopic group (range 84-119). The overall incidence of complications was 5.7% (range 0%-19%) in the arthroscopic group and 6.1% (range 0%-25%) in the open group. The most common complication type was neurologic, with an incidence of 2.1% (range 0%-8%) in the arthroscopic group and 1.9% (range 0%-12%) in the open group. The deep infection rate was 0.7% (range 0%-10%) in the open group with no reported incidence in the arthroscopic group.

Conclusions
This systematic review demonstrated good mid-term functional outcomes following debridement arthroplasty of the arthritic elbow. There was no increase in complications with an arthroscopic technique confirming its safety and efficacy.

Level of Evidence
IV, Systematic Review of Level III and IV articles.

BACK

Journal of Shoulder and Elbow Surgery (JSES), Volume 30, issue 02, pages 250 – 257

Multimodal oral analgesia strategy after ambulatory arthroscopic shoulder surgery: case series using adaptive therapeutic approaches by sequential analysis.

Garnaud, B., Mares, O., L'hermite, J., et al.

DOI: https://doi.org/10.1016/j.jse.2020.08.040

Background
Pain control and quality of recovery (QoR) at home remains a challenge after ambulatory shoulder arthroscopy. This study aims to assess the QoR and pain relief using a sequential implementation strategy for rescue analgesic drugs.

Methods
After institutional review board approval, patients (>18 years, American Society of Anesthesiology [ASA] score 1-3 stable) scheduled for ambulatory surgery under general anesthesia with a single-shot interscalene nerve block were enrolled. After discharge, patients received standard information regarding the postoperative recovery and care consisting of a multimodal analgesic regime (acetaminophen and ketoprofen for 5 days). The first 48 postoperative hours allowed us to compare 3 different rescue drug regimes with a control group, in sequential order: tramadol (control group), tramadol + nefopam, immediate-release oxycodone (IR), and extended-release oxycodone (ER). The primary endpoint was the QoR 40 score at 48 hours after surgery. Secondary endpoints were pain relief and adverse events over a 7-day period. An intention-to-treat statistical analysis was performed with sequential analysis (as an interim analysis) every 20 patients. Results were recorded as medians and interquartiles (25-75).

Results
We analyzed 109 patients with similar characteristics among groups. The QoR 40 scores were similar for the tramadol group (168 [161-172]), the tramadol + nefopam group (161 [151-173], P = .09), and the IR group (164 [153-169], P = .17), but higher for the ER group (176 [167-181], P = .03). Concerning adverse events, drugs were interrupted more frequently in the tramadol + nefopam group (36 %). In the ER group, a higher quality of postoperative relief was attained in the domains of pain and sleep.

Conclusion
The present study shows that a combination of IR and ER oxycodone over a short period of time (<48 hours) is associated with a better QoR at home after ambulatory shoulder surgery.

Level of evidence
Level II, Prospective Cohort Design, Treatment Study

BACK

Short-term outcomes of arthroscopic partial repair vs. latissimus dorsi tendon transfer in patients with massive and partially repairable rotator cuff tears.

Baverel, L.P., Bonnevialle, N., Joudet, T., et al.

DOI: https://doi.org/10.1016/j.jse.2020.06.002

Background
There is limited evidence on clinical outcomes of arthroscopic partial repair (APR) and latissimus dorsi tendon transfer (LDTT) for posterosuperior massive rotator cuff tears (mRCTs). We aimed to compare clinical outcomes of APR and LDTT for partially repairable posterosuperior mRCTs and to determine whether outcomes differ among tears that involve the teres minor.

Methods
We retrieved the records of 112 consecutive patients with mRCTs deemed partially repairable due to fatty infiltration (FI) stage ≥3 in one or more rotator cuff muscles. Of the tears, 12 involved the subscapularis, 32 were managed conservatively, 14 were treated by reverse shoulder arthroplasty, and 7 were treated by stand-alone biceps tenotomy. Of the remaining 47 shoulders, 26 underwent APR and 21 underwent LDTT. At a minimum of 12 months, we recorded complications, active forward elevation, external rotation, the Constant-Murley score, American Shoulder and Elbow Surgeons (ASES) score, Subjective Shoulder Value (SSV), and Simple Shoulder Test (SST) score.

Results
No significant differences between the APR and LDTT groups were found in terms of follow-up (23.4 ± 3.5 months vs. 22.1 ± 4.1 months, $P = .242$), Constant-Murley score (64.8 ± 13.7 vs. 58.9 ± 20.0, $P = .622$), ASES score (78.3 ± 19.3 vs. 74.4 ± 14.5, $P = .128$), active forward elevation (158.1° ± 19.4° vs. 142.8° ± 49.1°, $P = .698$), or external rotation (33.3° ± 17.4° vs. 32.2° ± 20.9°, $P = .752$). By contrast, the APR group had a higher SSV (73.3 ± 17.5 vs. 59.5 ± 20.0, $P = .010$), and SST score (8.3 ± 2.4 vs. 6.4 ± 3.0, $P = .024$). Univariable analysis revealed that advanced FI of the teres minor compromised Constant-Murley scores (β = –25.8, $P = .001$) and tended to compromise ASES scores (β = –15.2, $P = .062$). Multivariable analysis corroborated that advanced FI of the teres minor compromised Constant-Murley scores (β = –26.9, $P = .001$) and tended to compromise ASES scores (β = –16.5, $P = .058$).

Conclusion
Both APR and LDTT granted similar early clinical outcomes for partially repairable posterosuperior mRCTs, regardless whether the teres minor was intact or torn. Advanced FI of the teres minor was the only independent factor associated with outcomes, as it significantly compromised Constant-Murley scores and tended to compromise ASES scores.

Level of evidence
Level III, Retrospective Cohort Comparison, Treatment Study

BACK

Cost comparison of arthroscopic rotator cuff repair with arthroscopic vs. open biceps tenodesis.

DeFroda, S.F., Li, L., Milner, J., et al.

DOI: https://doi.org/10.1016/j.jse.2020.05.031

Purpose
To use a nationwide database to determine differences in cost between patients who underwent arthroscopic rotator cuff tear with open vs. arthroscopic biceps tenodesis (BT).

Methods
The 2014 State Ambulatory Surgical and Services Databases from 6 US states was utilized. All cases with CPT codes 29827 (arthroscopic rotator cuff repair [RCR]) and either 23430 (tenodesis of long tendon of biceps) or 29828 (arthroscopic BT) were selected. Cases that included both 23430 and 29828 were excluded, as were those missing demographic data. Generalized linear models were used to model costs based on the surgical and patient variables that were significant in the initial bivariate analysis ($P < .05$).

Results
A total of 3635 RCR and BT cases were identified. There were 2847 (78.3%) with arthroscopic BT and 788 (21.7%) with open BT. Patients undergoing arthroscopic BT were 3.1 years older than patients undergoing open BT ($P < .001$). For arthroscopic BT, 39.2% of the cases were women compared with 22.6% of the open cases ($P < .001$). For operative variables, arthroscopic BT required 9 fewer minutes in the OR than open cases ($P = .002$). Concomitant distal clavicle resection was performed in 35.5% of arthroscopic BT cases compared with 29.8% of open cases ($P = .004$). While controlling for other significant factors, open BT was associated with $5542 lower costs than arthroscopic BT in the setting of RCR ($P < .001$). In either case, concomitant subacromial decompression added $10,669 ($P < .001$), and distal clavicle resection added $3210 ($P < .001$). High-volume surgical facilities were associated with $4107 lower costs ($P < .001$).

Conclusions
In a large series of patients undergoing arthroscopic RCR with open vs. arthroscopic BT, open BT was associated with $5542 lower costs than arthroscopic. Given that both techniques have been shown to be similarly effective in long-term follow-up, surgeons should be aware of opportunities for cost saving, particularly with the advent of bundled surgical reimbursements.

Level of evidence
Level IV

BACK

BACK

How can we define clinically important improvement in pain scores after biceps tenodesis?

Lu, Y., Beletsky, A., Chahla, J., et al.

DOI: https://doi.org/10.1016/j.jse.2020.05.038

Background
Patient postoperative pain is an important consideration following biceps tenodesis. The visual analog scale (VAS) for pain is one of the most commonly used measures for perioperative pain assessment. Currently, there is limited understanding of clinically significant improvement in VAS pain.

Purpose
To define the substantial clinical benefit (SCB), patient acceptable symptomatic state (PASS), and minimal clinically important difference (MCID) for the VAS pain score in patients undergoing open subpectoral (OSPBT) or arthroscopic suprapectoral biceps tenodesis (ASPBT) at 1 year from surgery; and to identify preoperative predictors of achieving each outcome end point.

Methods
Data from consecutive patients who underwent isolated biceps tenodesis between January 2014 and March 2017 were collected and analyzed. Baseline data and postoperative patient-reported outcome (PRO) scores were recorded at 1 year postoperatively. In order to quantify the clinical significance of outcome achievement for the VAS pain score, the MCID, PASS, and SCB were calculated.

Results
A total of 165 patients were included in the final analysis. The VAS pain score threshold for achieving MCID was defined as a decrease of 12.9 (0-100). PASS was defined as achieving a 2-year postoperative score of 27.4 points (0-100), and SCB was defined as a decrease of 25.1 (0-100) at 1-year follow-up. The rates of achieving MCID, PASS, and SCB were 73.3%, 52.8%, and 45.9%, respectively. Multivariate regression analysis demonstrated that ASPBT ($P = .01$) and a lower preoperative Constant-Murley score were predictive of achieving the MCID ($P = .01$). In contrast, a lower preoperative score on the SF-12 Physical Component Summary ($P = .01$) and a higher score on the preoperative American Shoulder and Elbow Surgeons Standardized Shoulder Assessment Form ($P < .001$) were predictive of achieving the SCB and PASS, respectively. Preoperative duration of symptoms >6 months was predictive of a reduced likelihood to achieve PASS.

Conclusion
This study identified scores for VAS pain that can be used to define clinically significant outcome after biceps tenodesis. Specifically, a decrease in pain score of 12.9 was a clinically important improvement in VAS pain, whereas a decrease of 25.1 represented the upper threshold of VAS pain improvement. Additionally, there were both modifiable and nonmodifiable factors that predicted achieving clinically significant levels of postoperative pain improvement.

Level of evidence
Basic Science Study

BACK

American Journal of Sports Medicine (AJSM), Volume 49, Issue 02, pp. 321–331

Effects of 12 Weeks of Progressive Early Active Exercise Therapy After Surgical Rotator Cuff Repair: 12 Weeks and 1-Year Results From the CUT-N-MOVE Randomized Controlled Trial

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Background: Traumatic full-thickness rotator cuff tears are typically managed surgically, followed by rehabilitation, but the load progression to reach an optimal clinical outcome during postoperative rehabilitation is unknown.

Purpose: To evaluate whether there was a superior effect of 12 weeks of progressive active exercise therapy on shoulder function, pain, and quality of life compared with usual care.

Study Design: Randomized controlled trial; Level of evidence, 1.

Methods: Patients with surgically repaired traumatic full-thickness rotator cuff tears were recruited from 2 orthopaedic departments and randomized to progressive active exercise therapy (PR) or limited passive exercise therapy (UC [usual care]). The primary outcome was the change in the Western Ontario Rotator Cuff Index (WORC) score between groups from before surgery to 12 weeks after surgery. Secondary outcomes included changes in the Disabilities of the Arm, Shoulder and Hand (DASH) questionnaire score, pain, range of motion, and strength. Adverse events were registered during the intervention period.

Results: A total of 82 patients were randomized to the PR (n = 41) or UC (n = 41) group. All 82 patients (100%) participated in the 12-week assessment and 79 in the 1-year follow-up. At 12 weeks, there was no significant difference between the groups in the change in the WORC score from baseline adjusted for age, sex, and center (physical symptoms: P = .834; sports and recreation: P = .723; work: P = .541; lifestyle: P = .508; emotions: P = .568). Additionally, there was no between-group difference for the secondary outcomes including the WORC score at 1 year and the DASH score, pain, range of motion, and strength at 12 weeks and 1 year. Both groups showed significant improvements over time in all outcomes. In total, there were 13 retears (16%) at 1-year follow-up: 6 in the PR group and 7 in the UC group.

Conclusion: PR did not result in superior patient-reported and objective outcomes compared with UC at either short- or long-term follow-up (12 weeks and 1 year).

BACK

Arthroscopic Side-to-Side Repair of Massive Rotator Cuff Tears Maintains Adequate Functional Improvement at 12 to 14 Years' Follow-up

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First Published February 1, 2021; pp. 298–304

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Background: Rotator cuff tears are common shoulder injuries that often cause pain and loss of function. Nonanatomic side-to-side techniques facilitate repair by minimizing tensions within tendons to improve healing and optimize the thickness of sutured tissues.

Purpose/Hypothesis: The purpose was to evaluate long-term clinical and radiographic outcomes of arthroscopic side-to-side repair of massive rotator cuff tears (mRCTs). The hypothesis was that, at a minimum follow-up of 12 years, arthroscopic side-to-side repair maintains clinically important improvements.

Study Design: Case series; Level of evidence, 4.

Methods: The authors reviewed records of all patients who underwent arthroscopic repair of mRCTs over 2 consecutive years. A total of 30 adult patients met the eligibility criteria and underwent side-to-side repair. Patients were evaluated clinically using the Constant score (CS) and ultrasound to assess retears at 3 timepoints after surgery: 2 to 4 years, 5 to 7 years, and 12 to 14 years.

Results: At first follow-up (3.2 ± 0.5 years), all 30 patients had clinical and ultrasound assessment, which revealed 13 retears (43%). At second follow-up (6.2 ± 0.5 years), all 30 patients had clinical and ultrasound assessment, which revealed 2 new retears (total 50%). At final follow-up (13.0 ± 0.7 years), only 21 patients had clinical assessment (1 died and 8 could not be reached), and only 19 patients had ultrasound assessment, which revealed 6 new retears (total 79%). Both absolute CS and age-/sex-adjusted CS improved significantly from baseline values at first follow-up (73.5 and 96.6, respectively), and remained stable at second follow-up (69.0 and 91.9, respectively), and final follow-up (64.4 and 87.0, respectively). Compared to shoulders with intact repairs, those with retears tended to have lower absolute CS at all follow-up visits, although differences were not statistically significant.

Conclusion: Patients with mRCTs maintain satisfactory clinical scores at 12 to 14 years after arthroscopic side-to-side repair despite a high incidence of retears. Repair is a safe and effective treatment for mRCTs, providing a less invasive and less complex alternative to reverse shoulder arthroplasty and tendon transfer procedures

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Background:
Postoperative pain after arthroscopic rotator cuff repair (RCR) is difficult to predict and manage. The experience of pain is thought to be influenced by a range of different factors. Determining which patient factors contribute to the pain may help us to better understand and manage it.

BACK

Purpose:
To evaluate the preoperative patient characteristics that may be predictive of, and correlated with, postoperative pain after arthroscopic RCR.

Study Design:
Cohort study; Level of evidence, 3.

Methods:
The study evaluated 2172 patients who underwent an arthroscopic RCR between February 2004 and December 2015. Pain frequency and severity were measured preoperatively and at 6 weeks after surgery using a modified L'Insalata questionnaire with Likert scales. This 6-week time point was chosen as previous studies have shown patients rank this time point as high in terms of pain after RCR. Logistic regression analysis was conducted to examine the relationship between postoperative pain scores and preoperative pain scores, age, sex, tear size, strength, level of sporting and work activity, and work-related injury status.

Results:
The severity of preoperative pain at night ($r = 0.33$; $P < .001$), preoperative pain at rest ($r = 0.32$; $P < .001$), and frequency of extreme pain ($r = 0.31$; $P < .001$) were the strongest independent associations with the frequency of pain at 6 weeks postoperatively. Other associations with postoperative pain frequency included reduced liftoff strength ($r = -0.21$; $P < .001$), work-related injury status ($P < .001$), younger age ($P = .001$), and female sex ($P = .04$). Tear size was inversely related with pain severity ($R2 = 0.85$). The severity of preoperative pain had the strongest independent association with the severity of postoperative pain at 6 weeks after surgery ($r = 0.35$; $P < .001$). Other associations with postoperative pain severity included increased patient-ranked preoperative stiffness ($P < .001$), a poorer impression of one's shoulder ($P < .001$), reduced level of sporting activity ($P < .001$), and work-related injury status ($P < .001$).

Conclusion:
Multiple risk factors have been identified for postoperative pain after RCR, the strongest of which is preoperative pain. However, of note, the magnitude of the correlations between preoperative severity and frequency of pain and postoperative severity and frequency of pain were found to be weak to moderate ($r = 0.30$-0.35). This suggests that while preoperative pain and its severity are associated with postoperative pain, other factors are likely involved in predicting pain. Smaller tear size, younger age, female sex, and work-related injuries were also associated with postoperative pain at 6 weeks after surgery.
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BACK

Lower Extremity

Arthroscopy, Volume 37, Issue 02, P 554-563

Treatment of Labral Calcification in the Setting of Femoroacetabular Impingement Syndrome With Arthroscopic Calcification Excision, Labral Repair, and Osteoplasty Improves Outcomes

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https://doi.org/10.1016/j.arthro.2020.10.033

Purpose
To describe the diagnosis and 2-year outcomes of arthroscopic treatment for labral calcification in the setting of femoroacetabular impingement syndrome (FAIS).

Methods
A retrospective analysis was performed from a prospectively collected database of patients with FAIS undergoing hip arthroscopy. Patients with FAIS with labral calcification were differentiated radiographically from patients with other paralabral radiopaque densities such as os acetabuli, acetabular rim fractures, and labral ossification. Patients with FAIS with labral calcification were treated with arthroscopic calcification excision, labral repair, and osteoplasty and matched by age, sex, and body mass index with a cohort of patients with FAIS without labral calcifications who underwent labral repair and osteoplasty. Pre- and 2 years postoperatively, patients completed patient-reported outcome (PRO) scores including the modified Harris Hip Score, Hip disability and Osteoarthritis Outcome Score (HOOS), 12-item Short-Form survey, and visual analog scale.

Results
In total, 40 hips (21 male, 19 female) with FAIS and labral calcification were included (age 36.8 ± 8.1, body mass index, 25.9 ± 4.5). Patients with FAIS with labral calcification demonstrated similar significant PRO score improvements compared with a matched cohort of patients with FAIS without labral calcification at 2 years after surgery (visual analog scale: (–)2.3 ± 0.4, (–)2.7 ± 0.5, modified Harris Hip Score: 16.1 ± 2.6, 17.1 ± 3.2; HOOS symptoms: 21.9 ± 3.7, 18.6 ± 3.6; HOOS pain: 22.1 ± 3.0, 25.0 ± 3.5; HOOS activities of daily living: 20.2 ± 2.8, 23.8 ± 3.3; HOOS sport: 35.6 ± 5.0, 35.6 ± 4.1; HOOS quality of life: 36.9 ± 4.5, 37.5 ± 4.4; 12-item Short-Form survey physical component summary: 15.5 ± 2.3, 20.1 ± 2.1, respectively). Both cohorts achieved minimal clinically important differences at equivalent rates (60%-82.5%) for all PRO scores.

Conclusions
Patients with labral calcification in the setting of FAIS can be effectively treated with arthroscopic calcification excision, labral repair, and osteoplasty. These patients demonstrate significant improvements in patient-reported outcomes and achievement of minimal clinically important differences at 2 years similar to patients undergoing arthroscopic treatment for FAIS without labral calcification.

Level of Evidence
Level III, matched cohort study.

BACK

Five-Strand Versus Four-Strand Hamstring Autografts in Anterior Cruciate Ligament Reconstruction—A Prospective Randomized Controlled Study

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https://doi.org/10.1016/j.arthro.2020.08.012

Purpose
To compare the clinical outcomes of the routine use of 5-strand hamstring grafts (where possible) with those of 4-strand grafts in primary anterior cruciate ligament (ACL) reconstruction.

Methods
A total of 64 patients were enrolled in a prospective randomized controlled study comparing the use of 5-strand and 4-strand semitendinosus–gracilis autografts in single bundle ACL reconstruction (n = 32 in each group). Four participants in each group were lost to follow-up and were excluded from the outcome analysis. The outcomes of 28 patients in the 5-strand group and 28 patients in the 4-strand group were analyzed. The diameters of all grafts were measured intraoperatively. Patients were assessed postoperatively at 2 years with objective assessments (anterior knee laxity using the KT-2000 arthrometer, Lachman test, pivot-shift test, hop test) and patient-reported outcome scores (Lysholm knee score, Knee Injury and Osteoarthritis Outcome Score, International Knee Documentation Committee subjective knee score, SF-36 physical and mental components, Tegner activity scale). Postoperative graft ruptures were also noted.

Results
There were improvements in all outcome measures postoperatively regardless of the number of graft strands. When we compared the study and control groups, there were no significant differences in all subjective and objective outcome measures except the Knee Injury and Osteoarthritis Outcome Score symptoms score (5-strand group 93.3 ± 9.2 vs 4-strand group 86.2 ± 14.7, P = .04). The KT-2000 side-to-side difference was 2.79 ± 2.11 mm in the 5-strand group and 2.54 ± 1.75 mm in the 4-strand group (P = .63). The 5-strand study group had 2 graft ruptures at 1 year, whereas the 4-strand control group had one partial graft rupture at 6 months.

Conclusions
At 2-year follow-up, the routine use of the 5-strand hamstring tendon autograft was not superior to that of the quadrupled or 4-strand graft in primary ACL reconstruction.

Level of Evidence
Level I, prospective randomized controlled trial.

BACK

Hamstring Autograft Anterior Cruciate Ligament Reconstruction Using an All-Inside Technique With and Without Independent Suture Tape Reinforcement

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https://doi.org/10.1016/j.arthro.2020.09.002

Purpose
To compare the (1) rates of complications and reoperations, (2) rate of anterior cruciate ligament (ACL) graft failure, and (3) patient-reported outcomes (PROs) among patients after hamstring autograft ACL reconstruction (ACLR) with and without independent suture tape reinforcement at a minimum 2-year clinical follow-up.

Methods
We performed a 1:2 matched-cohort comparison of patients who underwent hamstring autograft ACLR with and without independent suture tape reinforcement between July 2011 and July 2017. Patients were matched according to age, sex, body mass index, preinjury Tegner activity score, and concomitant meniscal injury. Medical records were reviewed for demographic characteristics, additional injuries, and concomitant procedures. PRO scores (including Tegner activity, Lysholm, and International Knee Documentation Committee scores) and physical examination findings were collected both preoperatively and at a minimum of 2 years postoperatively.

Results
Overall, 108 patients who underwent ACLR were included: 36 patients (mean age, 25.3 years; range, 13-44 years) with independent suture tape reinforcement and 72 patients (mean age, 24.9 years; range, 13-54 years) without suture tape reinforcement. Overall, 5 of 36 suture tape patients (14%) and 10 of 72 control patients (14%) underwent reoperations. At an average follow-up of 26.1 months in the suture tape cohort and 31.3 months in the control cohort, 1 patient in the suture tape cohort and 4 patients in the control cohort experienced graft failure. There were no statistically significant differences between the suture tape and control groups regarding return-to-sport rate (89% and 88%, respectively), postoperative International Knee Documentation Committee score (94.4 and 93.8, respectively), and postoperative Lysholm score (95.6 and 94, respectively). There was a statistically significant difference between the suture tape and control groups in postoperative Tegner activity score, at 7.1 (95% confidence interval, 6.5-7.6) and 6.4 (95% confidence interval, 6.2-6.6), respectively (P = .026).

Conclusions
ACLR with hamstring autograft and independent suture tape reinforcement was performed safely with low rates of complications, graft failure, and reoperations with similar PROs, function, and return-to-sport rates when compared with hamstring autograft ACLR without suture tape reinforcement at a minimum 2-year follow-up.

Level of Evidence
Level III, retrospective comparative study.

BACK

The Effect of Combined Anterolateral and Anterior Cruciate Ligament Reconstruction on Reducing Pivot Shift Rate and Clinical Outcomes: A Meta-analysis

Xu, C., Chen, J., Cho, E., & Zhao, J.

https://doi.org/10.1016/j.arthro.2020.10.017

Purpose
To determine whether combined anterior cruciate ligament reconstruction (ACLR) and anterolateral ligament reconstruction (ALLR) result in better knee rotatory stability and postoperative clinical outcomes than ACLR alone.

Methods
A computer literature search was conducted of Medline (1982 to April 2020), Embase (1982 to April 2020), OVID (1982 to April 2020), and the Cochrane Library (1982 to April 2020) to screen all therapeutic trials on combined ACLR and ALLR versus isolated ACLR. Only level of evidence I and II clinical studies were included. The outcome measures included (1) objective knee stability examination such as anterior drawer test, Lachman test, KT-arthrometer measurement, and pivot shift test; (2) patient-reported outcomes such as International Knee Documentation Committee (IKDC), Tegner activity score, and Lysholm score; (3) return to play; and (4) graft rupture rate. Data were extracted, pooled, and analyzed to compare the 2 groups.

Results
A total of 890 studies were screened, and 884 were excluded. Six clinical trials with 828 subjects were included in the final meta-analysis. In comparison to patients received combined ACLR and ALLR, patients who received isolated ACLR had a significantly lower negative pivot shift test rate (odds ratio [OR] 0.46, 95% confidence interval [CI] 0.23 to 0.92, I2 = 0%, P = .03, 95% prediction interval [PrI] 1.00 to 2.26), Lysholm score (mean difference –2.79, 95 % CI –4.68 to –0.91, I2 = 77 %, P = .004, 95% PrI –10.81 to 5.42), Tegner score (mean difference –0.57, 95% CI –1.12 to –0.02, I2 = 90 %, P = .04, 95% PrI –3.12 to 1.93).

Conclusions
Combined ALLR and ACLR could effectively augment knee rotatory stability by reducing pivot shift rate and moderately improve patients' clinical outcomes. However, the effect of ALLR on overall graft rupture rate cannot be confirmed.

Level of evidence
II, meta-analysis of level I and II studies.

BACK

Knee Surgery, Sports Traumatology, Arthroscopy, February 2021, volume 29, issue 2, pages: 352-357

Meniscoplasty leads to good mid-term to long-term outcomes for children and adolescents with discoid lateral meniscus.

Ng, Y.H., Tan, S.H.S., Lim, A.K.S. *et al.*

DOI: https://doi-org.eur.idm.oclc.org/10.1007/s00167-020-05929-2

Purpose
To date, there have been limited studies reporting the mid- to long-term outcomes of meniscoplasties for discoid lateral meniscus. The current study aims to evaluate the mid- to long-term outcomes of arthroscopic meniscoplasty for discoid lateral meniscus in children and adolescents.

Methods
In the study, all patients under the age of 21 years who had undergone arthroscopic meniscoplasty with or without meniscal repair or partial meniscectomy for symptomatic lateral discoid meniscus were included. All patients were then followed up for a minimum of 5 years (median 84 months; range 68–110 months). The Lysholm scores and Ikeuchi scores were collected pre-operatively and at final follow-up and were compared.

Results
A total of 24 knees were included in the study. The median duration of follow-up was 84.0 months (range 68–110 months). The Lysholm score improved from 53 (range 11–95) pre-operatively to 100.0 (range 60–100) at final follow-up ($p < 0.001$). Based on the Ikeuchi score pre-operatively, 15 knees were rated as poor (62.5%), 7 knees were rated as fair (29.2%), and 2 knees were rated as good (8.4%). The Ikeuchi score improved significantly at the final follow-up, such that 1 knee was rated as good (4.2%) and 23 knees were rated as excellent (95.8%) ($p < 0.001$). When analysing the effect of concomitant meniscal repair or partial meniscectomy on the outcomes at final follow-up, there was no apparent difference in the improvement in Lysholm score or Ikeuchi score when comparing between patients who had meniscoplasty alone and patients who had concomitant meniscal repair, as well as when comparing between patients who had meniscoplasty alone and patients who had concomitant partial meniscectomy.

Conclusion
Meniscoplasty leads to good mid-term to long-term outcomes for children and adolescents with discoid lateral meniscus. Concomitant procedures such as meniscal repair or partial meniscectomy do not improve or worsen the mid- to long-term outcomes in these patients.

Level of evidence
IV.

BACK

The sagittal cutting plane affects evaluation of the femoral bone tunnel position on three-dimensional computed tomography after anterior cruciate ligament reconstruction.

Miyaji, N., Araki, D., Hoshino, Y. *et al.*

DOI: https://doi-org.eur.idm.oclc.org/10.1007/s00167-020-05963-0

Purpose
To investigate how the femoral sagittal cutting plane affects evaluation of the bone tunnel position after anterior cruciate ligament (ACL) reconstruction using the quadrant method in three-dimensional computed tomography (CT) imaging.

Methods
Thirty patients who underwent primary anatomic double-bundle ACL reconstruction and CT 2 weeks after surgery were enrolled. Three sagittal cutting planes with respect to the condylar axis were created using the CT images: at the top of the intercondylar notch (C-plane), 5% medial (M-plane), and 5% lateral (L-plane). The center of the bone tunnel position regarding depth and height of the anteromedial (AMB) and posterolateral bundle (PLB) were quantitatively evaluated using the quadrant method on the three different planes.

Results
The mean depths of AMB and PLB were 27.4 ± 4.4% and 39.7 ± 5.1%, 27.0 ± 4.2% and 37.6 ± 4.9%, and 27.4 ± 4.5% and 38.5 ± 6.0%, at the M, C and L planes, respectively. The mean heights of AMB and PLB were 30.8 ± 6.3% and 56.2 ± 5.6%, 30.4 ± 6.2% and 56.6 ± 5.6%, and 25.4 ± 7.0% and 52.9 ± 6.9% at the M, C, and L planes, respectively. Both AMB and PLB bone tunnels were evaluated as higher positions in the L-plane than the C-plane ($p < 0.01$, $p = 0.02$, respectively) and M-plane ($p < 0.01$, $p = 0.04$, respectively), but there were no significant differences between the C-plane and M-plane (n.s.). There was no significant difference in the anteroposterior direction for all planes.

Conclusion
In evaluations of the bone tunnel position with the quadrant method using three-dimensional CT, the bone tunnel position depends on the femoral sagittal cutting plane. A consistent evaluation method should be used when evaluating the bone tunnel position after ACL reconstruction to enable correct evaluation clinically.

Level of evidence
Case–control study, Level III.

BACK

Hamstring grafts for anterior cruciate ligament reconstruction show better magnetic resonance features when tibial insertion is preserved.

Grassi, A., Casali, M., Macchiarola, L. *et al.*

DOI: https://doi-org.eur.idm.oclc.org/10.1007/s00167-020-05948-z

Purpose
Comparing the MRI features of the grafts between a group of patients treated with an over-the-top anterior cruciate ligament reconstruction technique that preserves the hamstring attachment and a control group with a classical reconstruction technique.

Methods
Patients were assigned to a standard reconstruction technique or an Over-the-top plus lateral plasty technique. All patients underwent preoperative, 4-months and 18-months MRI; together with a clinical evaluation with KOOS and KT1000 laxity assessment. MRI study involved different parameters: the “Graft” was evaluated with the continuity, Howell Grading system, presence of liquid and signal noise quotient. The “Tibial Tunnel” was evaluated with the signal noise quotient, presence of edema or liquid and tunnel widening. All points assigned to each parameter formed a composite score ranging from 0–10. Tunnel and graft positioning were evaluated.

Results
At 18-month 20 MRIs (10 each group) were available, demographics were not significantly different between groups. The non-detached group showed significantly less liquid within the graft at 4-months ($p = 0.008$) and 18-months ($p = 0.028$), the tunnel was significantly smaller ($p < 0.05$) and less enlarged at both follow-ups ($p < 0.05$), signal noise quotient of the intra-tunnel graft was lower at 18-months ($p < 0.05$). The total score of the non-detached group saw a significant improvement at 4-months ($p = 0.006$) that remained stable at 18-months (n.s.).

Conclusions
Hamstring grafts, which tibial insertions were preserved, showed better MRI features at 4-and 18-months follow-up, especially in terms of liquid effusion, tunnel enlargement and signal noise quotient.

Level of evidence
IV.

BACK

American Journal of Sports Medicine (AJSM), Volume 49, Issue 02, P 364–373

Single-Stage Revision Anterior Cruciate Ligament Reconstruction: Experience With 91 Patients (40 Elite Athletes) Using an Algorithm

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https://doi.org/10.1177/0363546520976633

Background: The increased prevalence of anterior cruciate ligament (ACL) reconstruction has led to an increased need for revision ACL reconstructions. Despite the growing body of literature indicating that single-stage revision ACL reconstruction can yield good outcomes, there is a lack of data for determining when and how to safely perform a single-stage revision.

Purpose: To assess the outcomes, graft failure rates, and return-to-play rates of a decision-making algorithm for single-stage revision ACL reconstruction.

Study Design: Case series; Level of evidence, 4.

Methods: We reviewed a consecutive series of revision ACL reconstructions performed by the senior author between September 2009 and July 2016 with minimum 2-year follow-up. All patients were assessed, and decision making was undertaken according to the algorithm. Outcomes measured were further surgery, graft rerupture, re-revision, Tegner score, and Knee injury and Osteoarthritis Outcome Score (KOOS). For the elite athlete population, return-to-play time, duration, and level of play after surgery as compared with preinjury were also determined.

Results: During this period, 93 procedures were performed in 92 patients (40 elite athletes). Two 2-stage procedures were undertaken, leaving 91 single-stage procedures (91 patients) to form the basis for further study. At a mean 4.3 years (SD, 2.2 years) after surgery, there had been 2 re-revisions (2.2%) and 2 further instances of graft failure that had not been re-revised (total graft failure rate, 4.4%). There were 17 subsequent procedures, including 6 arthroscopic partial meniscectomies, 5 removals of prominent implants, and 1 total knee arthroplasty. The mean Tegner score was 8.02 before graft rerupture and 7.1 at follow-up. At follow-up, the mean KOOS outcomes were 79.3 for Symptoms, 88.0 for Pain, 94.2 for Activities of Daily Living, 73.6 for Sport, and 68.9 for Quality of Life. Of 40 elite athletes, 35 returned to play at a mean 11.2 months (SD, 3.6 months) after surgery.

Conclusion: Single-stage revision ACL reconstructions can be performed reliably in the majority of patients, with good clinical outcomes, low rerupture rates, and high-return-to play rates, even in the elite athlete population.

BACK

Functional, Magnetic Resonance Imaging, and Second-Look Arthroscopic Outcomes After Pullout Repair for Avulsion Tears of the Posterior Lateral Meniscus Root

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https://doi.org/10.1177/0363546520976635

Background: Little data exist in the literature regarding second-look arthroscopic outcomes after pullout repair for avulsion tears of the posterior lateral meniscus root.

Purpose: To (1) assess the functional, magnetic resonance imaging (MRI), and second-look arthroscopic outcomes after pullout repair for avulsion tears of the posterior lateral meniscus root; (2) determine which demographic and clinical factors influenced healing of the repaired posterior lateral meniscus root; and (3) compare outcomes between different meniscal healing status groups.

Study Design: Case series; Level of evidence, 4.

Methods: A total of 31 patients underwent pullout repair for avulsion tears of the posterior lateral meniscus root and had a minimum 2-year follow-up. Functional outcomes were assessed using patient-reported scores (Lysholm, Tegner, and International Knee Documentation Committee [IKDC] scores). Lateral meniscal extrusion, cartilage degeneration of the lateral compartment, and healing of the repaired posterior lateral meniscus root were assessed via MRI. The healing status was also assessed using second-look arthroscopic surgery, and the patients were divided into different healing status groups.

Results: The postoperative patient-reported scores improved significantly compared with the preoperative values ($P = .001$). Lateral meniscal extrusion was reduced significantly from 3.37 ± 0.82 mm preoperatively to 0.63 ± 0.80 mm at final follow-up ($P = .001$). The grade of cartilage degeneration of the lateral compartment progressed from 0.69 ± 0.67 preoperatively to 0.95 ± 0.83 at final follow-up ($P = .213$). MRI scans showed complete healing in 28 patients (90.3%) and partial healing in 3 patients (9.7%). Second-look arthroscopic surgery showed stable healing in 18 of 23 patients (78.3%) and lax healing in 5 of 23 patients (21.7%). Patients with stable healing had significantly higher Lysholm and IKDC scores, more reduction of meniscal extrusion, and less progression of cartilage degeneration than did patients with lax healing ($P < .05$). Concomitant anterior cruciate ligament reconstruction was found to significantly positively influence healing of the repaired posterior lateral meniscus root ($P = .047$).

Conclusion: Pullout repair for avulsion tears of the posterior lateral meniscus root yielded significantly improved patient-reported scores, reduced meniscal extrusion, and a satisfactory healing rate at final follow-up. Patients with stable healing had significantly better functional and MRI outcomes than did patients with lax healing.

BACK

Development of a Predictive Algorithm for Symptomatic Hip Abductor Tears in Patients Undergoing Primary Hip Arthroscopy

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https://doi.org/10.1177/0363546520980461

Background: Patients presenting with lateral hip pain may pose a difficult diagnostic challenge, as pain can be due to various causes.

Purpose/Hypothesis: The purpose was to identify risk factors and predictors for symptomatic hip abductor tears in a cohort of patients undergoing primary hip arthroscopy for femoroacetabular impingement syndrome. We hypothesized that body mass index (BMI), female sex, age, and presence of chondral damage would be significant predictors of hip abductor pathologies.

Study Design: Cohort study (diagnosis); Level of evidence, 3.

Methods: Data were prospectively collected and retrospectively reviewed. Patients were included if they underwent primary hip arthroscopy between March 2009 and December 2019. Patients with Tönnis grade >1, previous hip conditions, incomplete radiographic data, or open procedures were excluded. All demographic variables, intraoperative measurements, and radiographic measurements were assessed using a bivariate analysis. A stepwise logistic regression was used to determine predictive variables.

Results: In total, 255 hips with a hip abductor tear that underwent hip arthroscopy and 2106 hips without a tear that underwent hip arthroscopy were included. The stepwise logistic regression successfully created a predictive model using age, sex, BMI, lateral joint space, and alpha angle as variables. The efficiency of the predictive model was 90.7%, with an area under the curve of 0.894. The odds of having a hip abductor tear were 7.41 times higher in females (odds ratio [OR], 7.41; 95% CI, 4.61-11.9). Each additional year of age was associated with a 13.7% (OR, 1.137; 95% CI, 1.12-1.16) increase in the odds of having a tear. Similarly, with each 1-unit increase in BMI, the odds of having a tear increased by 3.4% (OR, 1.034; 95% CI, 1.01-1.06).

Conclusion: This study successfully created a predictive model that identified female sex (OR, 7.41), increasing age (OR, 1.137 for each year), and increased BMI (OR, 1.034 for each unit of BMI) as significant independent predictors of the presence of hip abductor tears in patients undergoing hip arthroscopy for femoroacetabular impingement syndrome. This model can be used in support of physical examination and imaging suggestive of hip abductor pathology to preoperatively identify the probability of a symptomatic hip abductor tear in these patients.
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