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BACK

Upper extremity

Arthroscopy, Volume 40, Issue 9

Primary Arthroscopic Repair for Massive Rotator Cuff Tears Results in Good Shoulder Function, Low Pain, and Satisfactory Outcomes at 2-Year Minimum Follow-Up

J. Rosenblum, R. Madi

DOI: 10.1016/j.arthro.2024.02.026

Purpose: To evaluate outcomes of patients who underwent primary arthroscopic repair for massive rotator cuff tears (MRCTs).

Methods: Patients with MRCTs (full-thickness tear of 2 or more tendons or full-thickness tear ≥5 cm) who underwent arthroscopic repair with a minimum follow-up of 2 years were retrospectively reviewed (n = 51). All patients had preoperative magnetic resonance imaging used to characterize pattern of tear, degree of fatty degeneration (Goutallier classification), and degree of rotator cuff arthropathy (Hamada classification). Outcomes were determined by American Shoulder and Elbow Surgeons (ASES) scores and Penn Shoulder Scores (PSS).

Results: A total of 51 patients with a minimum 2.3-year follow-up (mean, 5.4 years; range, 2.3-9.7 years) were included in this study. Mean ASES score was 46.1 ± 7.8 (95% CI, 43.9-48.3) for pain and 39.4 ± 12.1 (95% CI, 36.0-42.8) for function. Total ASES score averaged 85.5 ± 18.4 (95% CI, 80.4-90.7). PSS had a mean pain score of 26.8 ± 4.4 (95% CI, 25.4-28.1), a mean satisfaction score of 7.9 ± 2.9 (95% CI, 7.0-8.2), and a mean function score of 48.5 ± 13.5 (95% CI, 44.7-52.3). Total PSS averaged 83.2 ± 19.6 (95% CI, 77.7-87.7). No correlation was found between Goutallier grade and ASES/PSS scores or between Hamada grade and ASES/PSS scores. Three patients underwent reoperation after primary arthroscopic repair of an MRCT (5.9%).

Conclusion: Patients with MRCTs who undergo primary arthroscopic repair have postoperative outcome scores indicative of good shoulder function, low pain, and high satisfaction. The rate of reoperation for individuals who underwent primary arthroscopic repair with MRCTs was low at 6%.

Level of Evidence: Level IV, retrospective case series.

BACK

Suture Contamination During Arthroscopic Rotator Cuff Repair Is Associated With Significantly Higher Retear Rates in Magnetic Resonance Imaging: A Matched-Pair Analysis

C.-K. Hong, K.-L. Hsu

DOI: 10.1016/j.arthro.2024.02.019

Purpose: To evaluate the correlation between suture contamination and rotator cuff tendon retear after arthroscopic rotator cuff repair.

Methods: Patients undergoing primary arthroscopic rotator cuff repair from April 1, 2020, to September 30, 2022, were enrolled. Those younger than 18 years, with a history of shoulder surgeries or shoulder infection episodes, or who declined participation were excluded. A 5-cm section of the first-cut suture, originating from the anchor eyelet ends, in each rotator cuff repair surgery was subjected to bacteria culture and polymerase chain reaction analysis. Patients with positive culture findings were matched 1:1 to those with negative culture reports based on age, sex, tear size as well as involved tendons, preoperative fatty infiltration grade (Goutallier grade), and preoperative muscle atrophy grade (Warner score). Postoperative rotator cuff tendon retear assessments were conducted at the 6-month mark using the Sugaya classification via magnetic resonance imaging. The Wilcoxon signed-rank test was used for matched-pair comparisons between the groups.

Results: A total of 141 patients (60 men and 81 women) with a mean age of 61.0 ± 8 years were finally enrolled. Twenty-six patients (18 men and 8 women) had a positive culture, while 115 patients (42 men and 73 women) had a negative culture. After the propensity score matching process, 24 culture-negative patients (16 men and 8 women) were selected as the culture-negative group. Age, fatty infiltration grade, and muscle atrophy grade were not significantly different between matched groups. The retear grade in the culture-positive group was significantly higher than that in the culture-negative group (P = .020) under the matched-pair comparison. *Cutibacterium acnes* was the most prevalent bacterial species responsible for suture contamination.

Conclusion: The matched-pair analysis revealed that the presence of bacterial contamination on sutures was associated with a higher risk of retear on magnetic resonance imaging following arthroscopic rotator cuff repair.

Level of Evidence: Level III, retrospective cohort study.

BACK

High Rates of Union Following Arthroscopic Treatment of Scaphoid Non-Union: A Systematic Review

M. Burnier, C. Bouteille

DOI: 10.1016/j.arthro.2024.01.028

Purpose: To synthesize and analyze the existing literature and report on the outcomes of arthroscopic surgery for the treatment of scaphoid non-union (SNU).

Methods: This systematic review conforms to the Preferred Reporting Items for Systematic Reviews and Meta-Analysis guidelines. The authors conducted a search using Medline and Embase databases. Studies that reported outcomes on arthroscopic nonvascularized bone graft for SNU treatment, with no limits to follow-up, sample sizes or prevalence were included.

Results: We found 17 eligible studies composed of 20 datasets, and all assessed nonvascularized arthroscopic treatment for SNU, with a mean follow-up that ranged from 6 to 38.5 months. Union rates ranged between 86% and 100%, and none of the studies reported any other complications than non-union following arthroscopic SNU.

Conclusion: The present systematic review found union rates ranging between 86% and 100%, with a time to union ranging from 2.3 to 7.8 months. Furthermore, the included studies reported satisfactory clinical scores, and the complication rate of non-union ranged between 0% and 14%.

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

BACK

Journal of Shoulder and Elbow Surgery (JSES), Volume 33, issue 9

An isolated bioinductive repair vs sutured repair for full-thickness rotator cuff tears: 2-year results of a double blinded, randomized controlled trial

J.A. Camachon Chacón, V.R. Rojo

DOI: 10.1016/j.jse.2024.03.043

Background: Partial-thickness rotator cuff tears treated with an isolated bioinductive repair (IBR) in lieu of a completion-and-repair have shown complete healing. This treatment option is afforded by the remaining tendon's structural integrity, which is similar to that present in small/medium full-thickness tears (FTTs) when the rotator cable remains intact. This randomized controlled trial (RCT) investigated whether an IBR for small/medium full-thickness tears resulted in superior healing and patient-reported outcomes (PROs) compared with a sutured repair.

Methods: This prospective, double blinded (patients and outcome assessors), single-center randomized controlled trial enrolled patients ≥18 years with a small/medium (≤2.5 cm) full thickness supraspinatus tear and intact rotator cable. Patients were randomized and blinded to arthroscopic transosseous-equivalent repair (control, n = 30) or IBR (n = 30). The primary outcome was tendon quality on biopsy at 6 months. Secondary outcomes were PROs (American Shoulder and Elbow Surgeons [ASES], Constant-Murley Shoulder [CMS], and pain visual analogue scale scores) and tendon thickness and healing measured via MRI at 6, 12, and 24 months; satisfaction at 12 and 24 months; and time to return to work.

Results: Baseline demographic, tear, and surgical characteristics were comparable between the groups (IBR: mean age, 54.2 years, 14 male; control: mean age, 56.4 years, 16 male). Measured via a 6-month biopsy, highly organized, parallel bundles of collagen, without inflammation, were present in all IBR patients, whereas poorly organized, nonparallel collagen fibers were present in 24/30 (80%) of control patients ($P < .0001$), with 28/30 having minimal to mild inflammation. The increase in tendon thickness measured via MRI at 6 months from baseline was greater in the IBR group (2.0 mm) than in the control group (0.8 mm) ($P < .0001$). All IBR patients had 100% healing on MRI at 12 and 24 months. Compared with the control group, the IBR group had higher American Shoulder and Elbow Surgeons and Constant-Murley Shoulder scores at each evaluation, less pain at 6 and 12 months, and greater satisfaction at 12 and 24 months ($P < .0003$). The IBR group returned to work significantly faster (median 90 days [IQR, 25] vs. median 163.5 days [IQR, 24]; $P < .0001$) than the control group.

Conclusion: Compared with a sutured repair, the IBR treatment resulted in superior tendon quality, patient outcomes, satisfaction, and return to work. The IBR enabled a robust healing response evident through MRI and biopsy evaluation, demonstrating superior tendon quality and healing.

Level of Evidence: Level I, Randomized Controlled Trial, Treatment Study.

BACK

Does timing influence rehabilitation outcomes in arthroscopic rotator cuff repair with biceps rerouting? a prospective randomized study

Y.G. Rhee, Y.-S. Kim

DOI: 10.1016/j.jse.2024.01.029

Background: Arthroscopic rotator cuff repair with biceps rerouting (ABR) has emerged as a reliable option for treating large posterosuperior rotator cuff tears (RCTs). This study aims to compare functional and structural outcomes of early vs. delayed motion rehabilitation protocols following ABR.

Methods: A total of 101 patients with semirigid, large, posterosuperior RCTs undergoing ABR were randomized into 2 groups: group I (early motion) with 53 patients (34 females, 19 males) and group II (delayed motion) with 48 patients (31 females, 17 males). In group I, the mean age was 63.9 years (range, 46-79), and in group II, it was 65.4 years (range, 43-78). The mean follow-up periods for group I and group II were 16.2 and 15.5 months, respectively. Preoperative and postoperative assessments were conducted at 3, 6, and 12 months, with structural integrity assessed with magnetic resonance imaging at a minimum follow-up of 12 months. Statistical analyses were performed to compare outcomes between the 2 groups.

Results: Both groups demonstrated significant improvements in visual analog scale score (group I: 4.0-1.6, group II: 3.7-1.4, $P = .501$), University of California-Los Angeles shoulder score (group I: 21.5-31.4, group II: 22.4-30.6, $P = .331$), and acromiohumeral interval (group I: 8.2 mm-9.1 mm, group II: 8.6 mm-9.5 mm, $P = .412$), with no statistically or clinically meaningful differences. Active range of movements (ROM) were not significantly different between groups, except for active forward flexion at 3 months (group I: 140.1°, group II: 119.2°, $P = .006$), that was not shown to be translated clinically into differences in function or healing between the groups in this study. Notably, retear rates were similar between groups (group I: 22.6%, group II: 20.8%, $P = .826$).

Conclusion: This study's findings reveal no clinically discernible differences in active range of motion at 1-year follow-up between patients who underwent ABR for semirigid, large, posterosuperior RCTs and were assigned to either early or delayed motion protocols. Notably, the early motion group demonstrated a plateau in maximum range of movement improvement as early as 3 months postsurgery. Based on these results, implementing an early motion protocol is recommended as an effective approach in the postoperative rehabilitation following ABR.

Level of Evidence: Level I, Randomized Controlled Trial, Treatment Study.

BACK

Quantitative magnetic resonance imaging vs. perioperative arthroscopy to measure stage 1 ruptures of the supraspinatus tendon for surgical planning

E. Harly, P. Commeil

DOI: 10.1016/j.jse.2024.01.032

Background: Accurate preoperative assessment of supraspinatus tendon tear (STT) size is important for surgical planning. Our aims were to evaluate the correlation between stage 1 STT size measured preoperatively by quantitative magnetic resonance imaging (qMRI) and size measured perioperatively by arthroscopy. The concordance between preoperative tear size and the surgical plan was also assessed.

Methods: This prospective, nonrandomized, noncontrolled, interventional study was carried out in patients with a stable stage 1 STT. Three months before surgery, STT size was measured in the sagittal and coronal planes by a radiologist by qMRI (1.5 T). Three months later, the surgeon measured the size of the tear again on the same qMRI scans and decided on the most appropriate surgical plan. During arthroscopy, the surgeon measured the size of the tear again using a graduated sensor hook and carried out the repair. STT size measured preoperatively was compared to that measured by arthroscopy and the concordance between preoperative STT size and the surgical plan was determined.

Results: Sixty-seven patients were included (mean age: 59.5 ± 8.9 years; 58.2% female). There was good concordance between STT size measured by qMRI vs. arthroscopy in the coronal plane (concordance correlation coefficient = 0.36 [95% confidence interval (CI): 0.16-0.53]; Pearson's correlation coefficient = 0.42 [95% CI: 0.2-0.6]; $P = .0004$) and in the sagittal plane (concordance correlation coefficient = 0.51 [95% CI: 0.33-0.65]; Pearson's correlation coefficient = 0.57 [95% CI: 0.38-0.71]; $P < .0001$). Preoperative STT size concurred with the surgical plan in 85% of patients.

Conclusion: There was good concordance between STT size measured by qMRI and that measured perioperatively by arthroscopy. However, preoperative STT size measured by qMRI did not concur with the surgical plan in 15% of patients and in these patients the surgical procedure had to be revised during surgery.

Level of Evidence: Level III, Diagnostic Study.

BACK

Mid-term outcomes of microfracture for the treatment of focal, full-thickness cartilage defects isolated to the humeral head

R.-O. Dey Hazra, J.C. Rutledge

DOI: 10.1016/j.jse.2023.12.022

Background: While microfracture has been shown to be an effective treatment for chondral lesions in the knee, evidence to support its use for chondral defects in the shoulder is limited to short-term outcomes studies. The purpose of this study is to determine if microfracture provides pain relief and improved shoulder function in patients with isolated focal chondral defects of the humeral head at a minimum 5-year follow-up.

Methods: Patients who underwent microfracture procedure for isolated focal chondral defects of the humeral head with a minimum follow-up of 5 years between 02/2006 and 08/2016 were included. At minimum 5-year follow-up, pre- and postoperative patient-reported outcome (PRO) measures were collected, including the American Shoulder and Elbow Surgeons (ASES), Single Assessment Numeric Evaluation (SANE), Quick Disabilities of the Arm, Shoulder and Hand (QuickDASH), Short Form–12 (SF-12) Physical Component Summary (PCS), Visual Analog Scale (VAS) for pain, and patient satisfaction level (1 = unsatisfied, 10 = very satisfied). Demographic, injury, and surgical data were retrospectively reviewed. Surgical failure was defined as revision surgery for humeral chondral defects or conversion to arthroplasty. Kaplan–Meier analysis was performed to determine survivorship at 5 years.

Results: A total of 17 patients met inclusion/exclusion criteria. There were 15 men and 2 women with an average age of 51 years (range 36-69) and an average follow-up of 9.4 years (range 5.0-15.8). The median ASES score improved from 62 (range: 22-88) preoperatively to 90 (range: 50-100) postoperatively ($P = .011$). Median satisfaction was 8 out of 10 (range: 2-10). There was no correlation between patient age or defect size and PROs. Postoperatively, patients reported significant improvements in recreational and sporting activity as well as the ability to sleep on the affected shoulder ($P \leq .05$). Three patients failed and required revision surgery. The Kaplan–Meier analysis determined an overall survivorship rate of 80% at 5 years.

Conclusion: The presented study illustrates significant improvements for PROs, improved ability to perform recreational and sporting activities, and a survival rate of 80% at a mean of 9.4 years after microfracture for focal chondral humeral head defects.

Level of Evidence: Level IV, Case Series, Treatment Study.

BACK

Knee Surgery, Sports Traumatology, Arthroscopy (KSSTA), Volume 32, Issue 9

Unintended consequences: Hypotonic serum-induced acute kidney injury in shoulder arthroscopy

A. Rouhani, S. Samankan

DOI: https://doi.org/10.1002/ksa.12285

Abstract: Arthroscopic shoulder surgery is an orthopaedic technique that involves the use of normal saline or hyperosmolar serums as irrigation. The mentioned operation is commonly regarded as a safe medical intervention. Occasionally, it may have serious repercussions for the patient. Fluid extravasation into muscle tissues and tissue injury and instability are possible consequences. This can be affected by the type and amount of serum used and the length of the surgery. The objective of this study was to document four cases of shoulder arthroscopy in which sterile distilled water, wrongly labelled as irrigation fluid, was utilized during the surgical procedure. Patients were readmitted a week after discharge due to acute kidney injury symptoms like fatigue and lethargy. All four patients were released after haemodynamic stability and normalization after haemodialyses. Due to the incident, serums should be closely monitored and labeled for the safety of patients. Additionally, distilled water as an irrigation solution in arthroscopic surgeries can harm patients. Although normal saline and hyperosmolar serums are unavailable, this remains true.

Level of evidence: Level IV.

BACK

Arthroscopic management of isolated partial-thickness rotator cuff tears

U.G. Longo, M. Marino

DOI: https://doi.org/10.1002/ksa.12326

Purpose: The aim of the present study is to provide a comprehensive review on the surgical outcomes following arthroscopic treatments of partial-thickness rotator cuff tears (PT-RCTs) and to compare the postoperative American Shoulder and Elbow Surgeons (ASES) score following in situ transtendon repair and tear completion, followed by repair.

Methods: Medline, EMBASE, Scopus, CINAHL and CENTRAL bibliographic databases were searched. Papers including patients with PT-RCTs of any grade who underwent treatment using debridement, in situ transtendon repair, tear completion and repair or bioinductive collagen implants were reviewed. Primary PT-RCTs were the sole indication for surgery. Primary postoperative outcomes assessed included the ASES score, the Absolute Constant–Murley score, the Simple Shoulder Test, the Visual Analogue Scale, the University of California-Los Angeles Shoulder Scale, the Western Ontario Rotator Cuff Score, range of motion, complications and revisions. A meta-analysis of comparative studies compared the postoperative ASES score between patients treated with in situ transtendon repair versus tear completion repair.

Results: Twenty-eight studies were included. The ASES score was reported by four comparative studies with contrasting results. The heterogeneity was high ($I^2 = 86\%$), and effect sizes ranged from −0.49 in favour of the tear completion and repair technique to an effect size of +1.07 favouring in situ transtendon repair. The overall effect size of 0.02 suggests an equivalence between the two techniques in terms of the ASES score. Two studies with a total sample size of 111 patients reported on debridement, and four studies with a total sample size of 155 patients reported on bioinductive collagen implants.

Conclusion: Debridement alone is suitable for Ellman grades I-II PT-RCTs. In situ transtendon and tear completion repair techniques yield similar postoperative outcomes. Bioinductive collagen implants hold promise but lack long-term efficacy data. High-quality comparative studies are needed to determine the best treatment for PT-RCTs.

Level of evidence: Level IV.

BACK

American Journal of Sports Medicine (AJSM), Volume 52, Issue 11

The Arthroscopically Guided Bristow-Latarjet Procedure With Cortical Button Fixation: A Minimum 10-Year Follow-up

J. Descamps, V. Greco

DOI: https://doi.org/10.1177/03635465241263590

Background: Despite improved visualization, the use of arthroscopic surgery to perform the Latarjet procedure has not decreased the rates of complications and glenohumeral osteoarthritis (OA) in the long term. Many of the reported complications are related to the use of screws for bone block fixation with freehand drilling.

Purpose: To evaluate the long-term (at a minimum 10-year follow-up) clinical and radiological outcomes of the arthroscopic Bristow-Latarjet procedure using a posterior guided drilling technique and suture button for coracoid bone graft fixation.

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

Methods: Consecutive patients who underwent the arthroscopic Bristow-Latarjet procedure with suture button fixation between 2011 and 2013 were reviewed by 2 independent evaluators. Complications and revision surgery were recorded, and we evaluated patient-reported outcomes including subjective scores, recurrence of shoulder instability (dislocation or subluxation), range of motion limitations, and return to sports. Patients had radiographs taken at least 10 years after surgery to assess glenohumeral OA according to the Samilson-Prieto classification system and computed tomography scans to assess bone block positioning and healing.

Results: A total of 65 consecutive patients (68 shoulders) with a mean follow-up of 135 months (range, 120-156 months) were included. The mean age at the time of surgery was 25 ± 8 years; 7 patients had previous failed Bankart repair. At follow-up, 94% (64/68) of the shoulders had no recurrence of instability. The 4 cases of instability recurrence were traumatic and occurred at 3 weeks (a fall), 4 months, 2 years, and 7 years after surgery. No hardware failures, coracoid fractures, or neurological complications were observed. Overall, 61 patients (94%) were still participating in sports, with 44 (68%) at the same or higher level. Range of motion showed nonsignificant restrictions in external rotation with the arm at the side (7° ± 9°) and with the arm at 90° of abduction (9° ± 10°) compared with the contralateral side. Additionally, 11 shoulders (16%) had some residual anterior apprehension on clinical examination. At last follow-up, 77% (47/61) of the shoulders had no OA development or progression. Previous failed Bankart repair was a risk factor for the development of OA. Patients with OA had significantly lower Subjective Shoulder Value scores (79% vs 91%, respectively; P = .01) and decreased external rotation with the arm at the side (40° vs 65°, respectively; P = .001) compared with patients with no or little OA.

Conclusion: The arthroscopically guided Bristow-Latarjet procedure with suture button fixation is a safe and durable surgical treatment method for recurrent anterior shoulder instability, allowing a high rate of return to sports without significant motion restrictions and no or little OA in the long term.

BACK

Effect of Medial or Lateral Graft Failure on Graft Volume and Clinical Outcomes After Superior Capsule Reconstruction for Irreparable Rotator Cuff Tears

S.-J. Shin, S. Lee

DOI: https://doi.org/10.1177/03635465241265085

Background: Graft failure is a common complication after superior capsule reconstruction (SCR). The graft in SCR is fixed on the greater tuberosity and superior glenoid, and graft failure has been reported on both sides.

Purpose: To evaluate the clinical manifestations of patients with graft failure after SCR and identify the clinical and radiological differences between medial and lateral graft failure.

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

Methods: Patients who underwent SCR with a dermal allograft for symptomatic irreparable rotator cuff tears between March 2018 and September 2021 were retrospectively reviewed. All patients had minimum 2-year follow-up and underwent magnetic resonance imaging at 6 months postoperatively. Patients with graft failure were divided into 2 groups: those with lateral graft failure on the greater tuberosity side (group I) and those with medial graft failure on the glenoid side (group II). Patients with intact grafts were included in group III as a control group. Intergroup differences in clinical and radiological characteristics were analyzed, and multiple regression analysis was performed.

Results: Among the 93 patients included, there were 18 patients in group I, 15 in group II, and 60 in group III. Overall, 11 patients (61.1%) in group I and 9 patients (60.0%) in group II had a partial graft rupture at one anchor. The postoperative graft volume was significantly lower in group I than in groups II and III (2514.0 ± 564.3 mm3, 3183.5 ± 547.1 mm3, and 3198.0 ± 584.8 mm3, respectively; $P = .002$ for group I vs II; $P < .001$ for group I vs III). The acromiohumeral distance (AHD) was significantly increased at 6 months postoperatively compared with before surgery in group I (6.6 ± 1.6 mm vs 4.3 ± 1.9 mm, respectively; $P < .001$) and group II (7.4 ± 1.3 mm vs 5.7 ± 1.7 mm, respectively; $P = .002$). However, group I exhibited a significantly greater decrease in the AHD over time than group II ($P < .001$) and a significantly lower AHD at the final follow-up than the other groups ($P < .001$). The postoperative American Shoulder and Elbow Surgeons score was significantly lower in group I than in the other groups ($P < .001$). On multiple regression analysis, fatty infiltration of the infraspinatus muscle, Hamada grade, and graft width were independent factors for lateral graft failure.

Conclusion: Patients with lateral graft failure had inferior clinical outcomes and lower postoperative graft volumes than those with medial graft failure after SCR using a dermal allograft. The AHD of patients with lateral graft failure improved postoperatively; however, it deteriorated over time.

BACK

Effect of Preoperative Lipidemic Control on Retear Rates After Rotator Cuff Repair in Patients With Hyperlipidemia

M.-S. Kim, G.-Y. Jang

DOI: https://doi.org/10.1177/03635465241264818

Background: In patients with hyperlipidemia, the risk of retear increases after rotator cuff repair (RCR). In particular, it has been reported that preoperative low-density lipoprotein cholesterol (LDL-C) level affects cuff integrity. However, there are no studies assessing whether lipidemic control affects cuff healing.

Purpose: To evaluate the effect of preoperative lipidemic control on cuff integrity after arthroscopic RCR across cardiovascular disease risk groups in patients with hyperlipidemia.

Study Design: Case-control study; Level of evidence, 3.

Methods: The authors retrospectively reviewed the charts of patients with hyperlipidemia who underwent arthroscopic double-row suture bridge RCR between 2014 and 2019. The included patients had LDL-C tested within 1 month before surgery. Magnetic resonance imaging was conducted 6 months after surgery to evaluate the integrity of the repaired cuff tendon. Patients were divided into groups of low, moderate, high, and very high risk according to the 4th Korean Dyslipidemia Guidelines. On the basis of the target LDL-C set in each risk group, patients were categorized into 2 groups: group C (controlled hyperlipidemia, less than target LDL-C) and group U (uncontrolled hyperlipidemia, target LDL-C or greater). The correlation between serum lipid profile, lipidemic control, and post-RCR integrity was evaluated.

Results: A total of 148 patients were analyzed, 51 in group U and 97 in group C. The retear rate was significantly higher in group U than in group C (23/51 [45.1%] vs 18/97 [18.6%], respectively; P = .001). The proportion of group U was significantly higher in the retear group than in the healing group (56.1% vs 26.2%; P = .001). In addition, the proportions of patients with uncontrolled diabetes mellitus (DM) (19.5% vs 3.7%; P = .002) and mediolateral (2.6 ± 1.2 cm vs 1.7 ± 1.1 cm; P < .001) and anteroposterior (2.2 ± 1.1 cm vs 1.6 ± 0.8 cm; P = .003) tear sizes were significantly different between the retear and healing groups, respectively. No significant difference in serum lipid profile, including LDL-C level (119.6 ± 31.3 vs 116.7 ± 37.2; P = .650), was observed between the retear and healing groups. Multivariate regression analysis identified uncontrolled hyperlipidemia (OR, 4.005; P = .001), uncontrolled DM (OR, 5.096; P = .022), and mediolateral tear size (OR, 1.764; P = .002) as independent risk factors for retear. The 2.0-cm mediolateral size cutoff and the 3 independent risk factors had significant associations with retear.

Conclusion: Poor preoperative lipidemic control was significantly associated with poor healing after RCR. In addition to large mediolateral tear size, uncontrolled hyperlipidemia and DM were significant risk factors for retear. Moreover, poor lipidemic control compared with the recommended target level before surgery was more correlated with an increased retear rate than a preoperative LDL-C level.

BACK

Journal of Bone and Joint Surgery (JBJS), Volume 106, Issue 19+20

No Upper Extremity Abstracts

BACK

Clinical Orthopaedics and Related Research (CORR), Volume 482, Issue 9

No Upper Extremity Abstracts

BACK

Bone and Joint Journal (BJJ), Volume 106-B, issue 9

No Upper Extremity Abstracts

BACK

Lower Extremity

Arthroscopy, Volume 40, Issue 9

Corticosteroid Injections Administered Within 4 Weeks Prior to Hip Arthroscopy Are Associated With Higher Rates of Postoperative Infection

S. Surucu, S.J. Halperin

DOI: 10.1016/j.arthro.2024.01.016

Purpose: To evaluate the association between the timing of intra-articular hip corticosteroid injections and the risk of postoperative infection in patients undergoing hip arthroscopy.

Methods: The 2010-2021 PearlDiver M157 administrative claims database was queried for patients who underwent hip arthroscopy. Patients who received intra-articular corticosteroid injections within 12 weeks prior to arthroscopy were matched 1:1 to patients who did not receive such injections based on age, sex, and Elixhauser Comorbidity Index, as well as the presence of diabetes mellitus, hypertension, obesity, and tobacco use. Those with injections prior to arthroscopy were subdivided based on having received injections within 12 weeks prior to surgery. To verify that the corticosteroid injections and surgical procedures were conducted in the hip joint, Current Procedural Terminology codes were used. By use of Current Procedural Terminology and *International Classification of Diseases* (ninth revision and tenth revision) coding, postoperative surgical-site infection after corticosteroid injection was evaluated. The impact of the timing of preoperative corticosteroid injections on the incidence of postoperative infection was evaluated using multivariable logistic regression analysis.

Results: A total of 12,390 hip arthroscopy cases were identified, including 3,579 patients who received corticosteroid injections 0 to 4 weeks prior to surgery; 4,759, within 4 to 8 weeks prior to surgery; and 4,052, within 8 to 12 weeks prior to surgery. Compared with controls, patients who received corticosteroid injections within 0 to 4 weeks preoperatively had a significantly higher rate of surgical-site infection (odds ratio, 2.43; $P = .0001$). No significant differences in infection rates were observed at the later time intervals (4-8 weeks or 8-12 weeks). Furthermore, in comparison to controls, patients who received corticosteroid injections had a significantly higher rate of wound dehiscence (odds ratio, 1.84; $P = .0007$).

Conclusion: Intra-articular corticosteroid injections within 4 weeks prior to hip arthroscopy were significantly associated with increased surgical-site infection rates after hip arthroscopy surgery.

Level of Evidence: Level III, retrospective comparative study.

BACK

No Differences in Clinical Outcomes Between Hip Arthroscopy With Versus Without Capsular Closure in Patients With Cam- or Mixed-Type Femoroacetabular Impingement: A Randomized Controlled Trial

N. Bonin, F. Manzini

DOI: 10.1016/j.arthro.2023.12.019

Purpose: To compare 2-year clinical outcomes of primary hip arthroscopy with versus without capsular closure after interportal capsulotomy in patients with cam- or mixed-type femoroacetabular impingement (FAI).

Methods: Patients with cam- or mixed-type FAI undergoing primary hip arthroscopy with interportal capsulotomy were prospectively enrolled in this randomized controlled trial (RCT) and allocated into either capsular closure or no capsular closure groups. Patients were blinded to group allocation. Clinical outcomes were assessed preoperatively and at 2-year follow-up using the 12-item International Hip Outcome Tool (iHOT-12), modified Harris Hip Score (mHHS), and 6 subsections of the Copenhagen Hip and Groin Outcome Score (HAGOS). Complications and reoperations were noted.

Results: Eighty-four patients (100 hips) were enrolled, 49 hips in the capsular closure group and 51 in the no capsular closure group, with no significant differences in age (28.5 ± 7.5 vs 30.4 ± 8.4, $P = .261$), body mass index (23.5 ± 3.0 vs 23.4 ± 1.9, $P = .665$), and sex distribution (female: 10.2% vs 13.7%, $P = .760$). Four patients were lost to follow-up (2.0% vs 5.9%, $P = .618$) and 6 had reoperations (6.1% vs 5.9%, $P = 1.000$), which left 45 hips per group for clinical assessment. There were no significant differences between groups in the net change of iHOT-12 (28.3 ± 19.6 vs 32.5 ± 22.7, $P = .388$), mHHS (7.6 ± 13.1 vs 7.5 ± 10.2, $P = .954$), and subsections of HAGOS ($P > .05$). Complication rates were also similar between groups ($P > .05$).

Conclusion: The present RCT compared primary hip arthroscopy with versus without capsular closure after interportal capsulotomy in a male-dominated, non-dysplastic, non-arthritic cohort with cam- or mixed-type FAI and found no significant differences in patient-reported clinical outcomes, complication rates, or reoperation rates.

Level of Evidence: Level I, randomized controlled trial.

BACK

Patients Aged 40 Years and Older Demonstrate Durable and Comparable Results to Patients Aged Less Than 40 Years After Primary Hip Arthroscopy for Femoroacetabular Impingement Syndrome: A Propensity Matched Study at Minimum 10-Year Follow-Up

T.W. Fenn, J.J. Chan

DOI: 10.1016/j.arthro.2024.01.004

Purpose: To compare clinical outcomes and rates of secondary surgery, including revision hip arthroscopy and conversion to total hip arthroplasty (THA), after primary hip arthroscopy for femoroacetabular impingement syndrome (FAIS) in patients ≥40 years of age at minimum 10-year follow-up compared with a propensity-matched control group of patients <40 years.

Methods: A retrospective cohort study was performed for patients who underwent primary hip arthroscopy for FAIS between January 2012 and February 2013. Patients ≥40 years old were propensity matched in a 1:1 ratio by sex and body mass index to patients <40 years old. Patient-reported outcomes (PROs) including Hip Outcome Score for Activities of Daily Living and Sports-Specific subscales, modified Harris Hip, International Hip Outcome Tool–12, and Visual Analog Scale for Pain and Satisfaction were collected. Rates of minimal clinically important difference (MCID) and patient-acceptable symptomatic state (PASS) achievement at 10 years were evaluated and compared between groups. Rates of secondary surgery including revision hip arthroscopy and conversion to THA were evaluated. Gross survivorship between cohorts was evaluated using a Kaplan-Meier curve.

Results: Fifty-three patients aged ≥40 (age 48.3 ± 5.8 years) were successfully matched to 53 patients aged <40 (age: 28.9 ± 7.2, <0.001). There were no other preoperative group differences regarding patient demographics, characteristics, or radiographic findings. Both groups demonstrated significant improvement regarding all PROs at a minimum of 10 years' follow-up (P < .001 for all). No significant difference was noted between cohorts regarding any delta (preoperative to 10-year postoperative) scores (P > .05 for all). High rates of MCID and PASS achievement were achieved in both cohorts, with no significant differences in any PRO measure (P > .05 for all). No significant differences in rates of complications (age ≥40: 2.0%, age <40: 7.7%, P = .363), rates of revision (age ≥40: 7.5%, age <40: 9.4%, P = .999), or conversion to THA (age ≥40: 13.2%, age <40: 3.8%, P = .161) were identified. On Kaplan-Meier analysis, no significant difference (P = .321) was demonstrated in overall gross survivorship between cohorts.

Conclusion: Patients with age ≥40 with FAIS undergoing primary hip arthroscopy demonstrated durable and comparable 10-year PRO and rates of MCID and PASS achievement compared with a propensity-matched cohort of age <40 counterparts.

Level of Evidence: Level III, retrospective comparative prognostic trial.

BACK

Skeletal Maturity Is Associated With Increased Meniscal and Chondral Pathology in Patients Under 21 Years of Age Undergoing Primary Anterior Cruciate Ligament Reconstruction Within 6 Months of Injury

T. Phillips, B. Ronna

DOI: 10.1016/j.arthro.2024.01.022

Purpose: To compare injury profiles of meniscal and/or chondral injury in skeletally mature (SM) with immature (SI) patients undergoing primary anterior cruciate ligament reconstruction (ACLR).

Methods: *Current Procedural Terminology* code 29888 was queried from January 2012 to April 2020. Patients younger than 22 years who underwent primary ACLR within 6 months of injury were included. Exclusion criteria included age older than 22 years, treatment after 6 months, revision ACLR, concurrent osteotomy, or multiligamentous injury. All patients required a minimum 1-year follow-up. Demographics and intraoperative pathology were recorded. Data were analyzed for factors affecting intra-articular injury and stratified by sport.

Results: Of 927 patients (739 SM, 188 SI), the mean age was 16.63 and 14.00 years for the SM and SI cohorts, respectively ($P < .001$). There were more SM males (51.4%) compared to SI males (81.9%) ($P < .001$); however, in univariate analysis, sex did not significantly affect the rates of meniscal ($P = .519$) or chondral injury ($P = .961$). In total, 887 meniscal injuries were recorded (344 medial, 543 lateral) in 659 patients. SM sustained greater rates of medial meniscal tear (MMT) ($P < .001$) and underwent higher rates of partial meniscectomy ($P = .022$). Male sex conferred meniscal injury (95% confidence interval [CI], 0.43-0.81; $P = .001$). Body mass index prognosticated medial meniscal (95% CI, 1.01-1.06; $P = .002$) and medial chondral injuries (95% CI, 1.02-1.09; $P < .001$). Skeletal maturity was a superior predictor of intra-articular pathology than age for all outcomes: MMT (95% CI, 0.00-0.06; $P = .002$), lateral meniscal tear (95% CI, 0.00-0.75; $P = .034$), and chondral injury (95% CI, 0.00-0.49; $P = .049$). In sport subanalysis, soccer anterior cruciate ligament (ACL) injuries were most common (32.6%). Soccer and basketball athletes were more likely SM ($P = .016$, $P = .003$ respectively) with increased medial compartment pathology. Football ACL injuries occurred significantly in SI athletes ($P = .001$) via contact mechanisms ($P = .025$).

Conclusion: Skeletal maturity affects the meniscal and chondral injury profile in ACL-injured patients. SM patients have greater risk of sustaining concomitant meniscal injury, while chondral injury profile depends more on the mechanism of injury. Mechanism of injury and skeletal maturity status affect risk of sports-related ACL rupture and ACL-concurrent pathology in young patients. Patient-specific variables influence injury profiles within each sport. Skeletal maturity rather than age predicts concomitant intra-articular injury risk.

Level of Evidence: Level III, retrospective cohort study.

BACK

Less Subsequent Revision Anterior Cruciate Ligament Reconstruction Following Primary Bone–Patellar Tendon–Bone Anterior Cruciate Ligament Reconstruction with Suture Tape Augmentation—A Retrospective Comparative Therapeutic Trial With 5-Year Follow-Up

A.V. Daniel, P.A. Smith

DOI: 10.1016/j.arthro.2024.01.019

Purpose: To investigate patient outcomes, including revision rate, following primary bone patellar–tendon bone autograft (BPTB) anterior cruciate ligament reconstruction (ACLR) with and without suture tape augmentation (STA) in a young and active cohort.

Methods: All eligible patients who received primary BPTB ACLR with a minimum of 2-year follow-up were included in this retrospective cohort study. All patients receiving STA were augmented with the same device. Patients completed the following patient-reported outcome measures (PROMs): the visual analog scale, the Single Assessment Numeric Evaluation, the Knee Injury and Osteoarthritis Outcome Score subscales, and the Tegner activity scale. Anteroposterior knee laxity was assessed using a KT-1000 arthrometer preoperatively and 1-year postoperatively. Posterior tibial slope, femoral tunnel angle, and tibial tunnel placement were calculated for all patients. Subsequent surgical interventions and return to sport (RTS) were obtained from each patient.

Results: One hundred fourteen patients (52 BPTB ACLR with STA, 62 traditional BPTB ACLR) with a mean patient age <19 years and a mean final follow-up of ≥5 years were included. Compared with the control group, the STA group demonstrated significantly less subsequent revision ACLR (0 vs. 5, $P = .036$). All PROMs and KT-1000 measurements improved at final follow-up ($P < .001$) and were comparable between groups. There were no differences seen in either posterior tibial slope or graft tunnel placement between groups. More than 85% of the patients were able to return to the sport that led to their injury at full capacity with no differences seen in RTS rate, time to RTS, or level of competition between groups.

Conclusion: Compared with traditional BPTB ACLR, additional STA appeared to safely and effectively lead to less subsequent revision ACLR while maintaining acceptable PROMs and objective joint laxity measurements in a young and active patient population.

Level of Evidence: Level III, retrospective cohort study.

BACK

All-Inside and Inside-Out Repair Techniques for Bucket-Handle Meniscus Tears Both Result in Improved Patient Outcomes and a Broad Range of Failure Rates: A Systematic Review

L. Dzidzishvili, R. Saad Berreta

DOI: 10.1016/j.arthro.2024.01.021

Purpose: To compare patient-reported outcomes, failure rates, risk factors for failure, and complications in patients with bucket-handle meniscus tears (BHMTs) undergoing repair with inside-out (IO) versus all-inside (AI) techniques.

Methods: A literature search was performed using the PubMed, Embase, and Scopus databases from database inception to August 2023 according to the 2020 PRISMA (Preferred Reporting Items for Systematic Reviews and Meta-analyses) guidelines. The inclusion criteria consisted of Level I to IV clinical studies published in the past 10 years with greater than 2 years of follow-up that evaluated patient-reported outcome scores and/or the incidence of failure after IO or AI repairs for BHMTs. Clinical studies not reporting outcomes or failure rates, older studies using outdated implants, animal studies, reviews, letters to the editor, case reports, cadaveric studies, and articles not written in the English language or with English-language translation were excluded. Study quality was assessed using the Methodological Index for Non-randomized Studies (MINORS) criteria. Outcomes were reported as ranges and qualitatively compared.

Results: A total of 16 studies published from 2013 to 2023, consisting of 1,062 patients with BHMTs, were identified. Thirteen studies (14 cohorts, 649 patients) reported on AI repair (mean age range, 23.7-32 years) and 7 studies (7 cohorts, 413 patients) reported on IO repair (mean age range, 16.7-34.6 years). Both groups had improved postoperative Lysholm and Tegner scores. Decreased range of motion was the most commonly reported complication in the AI group (range, 2.6%-4%), whereas adhesions for arthrofibrosis were the most commonly reported complication in the IO group (n = 12; range, 6%-7.9%). The overall reported failure rate ranged from 6.9% to 20.5% within the AI group and from 0% to 20% within the IO group.

Conclusion: AI and IO repair techniques for BHMTs both result in improved Lysholm and Tegner scores. However, broad ranges of failure are reported in the literature, with overall failure rates ranging from 6.9% to 20.5% after AI repair and from 0% to 20% after IO repair. Younger age and isolated medial BHMT repair are the most frequently reported risk factors for the AI technique, whereas postoperative stiffness is the most frequently reported complication after both repair techniques.

Level of Evidence: Level IV, systematic review of Level I to IV studies.

BACK

Insufficient Evidence for Anterior Cruciate Ligament Reconstruction Utilizing Suture Tape Augmentation: A Systematic Review of Clinical Outcomes at Minimum 1-Year Follow-Up

J. Dhillon, G. Tanguilig

DOI: 10.1016/j.arthro.2024.01.026

Purpose: To perform a systematic review of clinical studies to directly compare clinical outcomes of patients undergoing anterior cruciate ligament reconstruction (ACLR) with versus without suture tape (ST) augmentation.

Methods: A systematic review was performed by searching PubMed, the Cochrane Library, and Embase to identify comparative studies directly comparing outcomes of ACLR with versus without ST augmentation with a minimum follow-up of 12 months. The search terms used were *anterior cruciate ligament suture tape*. Patients were evaluated based on graft failure rates, return to sport (RTS), anteroposterior (AP) laxity, and patient-reported outcomes (PROs).

Results: Five studies (all Level III) met inclusion criteria, including a total of 246 patients undergoing ACLR with ST augmentation (SA group) and 282 patients undergoing ACLR without augmentation (control group). Patient age ranged from 14.9 to 29.7 years. The mean follow-up time ranged from 24.0 to 48.6 months. The mean body mass index ranged from 25.3 to 26.3 kg/m^2 and the overall percentage of males ranged from 43.4% to 69.0%. Overall, the graft failure rate ranged from 1.0% to 25.0% in the SA group and 8.0% to 20.0% in the control group. Among the studies that reported RTS rates, the rate ranged from 69.2% to 88.9% in the SA group and 51.5% to 87.5% in the control group. Among all PROs, 2 studies found a significant difference in the Tegner score favoring the SA group. Otherwise, no significant differences were found between groups in terms of PROs. No significant differences in AP laxity were found between groups within any particular study. There was heterogeneity between studies regarding surgical techniques, postoperative rehabilitation protocols, and reported PROs.

Conclusion: There is insufficient evidence to suggest that patients undergoing ACLR with ST augmentation may experience favorable clinical outcomes compared with ACLR alone.

Level of Evidence: Level III, systematic review of Level III studies.

BACK

Journal of Shoulder and Elbow Surgery (JSES), Volume 33, issue 9

No Lower Extremity Abstracts

BACK

Knee Surgery, Sports Traumatology, Arthroscopy (KSSTA), Volume 32 Issue 9

Meniscal healing status after medial meniscus posterior root repair negatively correlates with a midterm increase in medial meniscus extrusion

K. Kawada, T. Furumatsu

DOI: https://doi.org/10.1002/ksa.12245

Purpose: The second-look arthroscopic score of pullout repair for medial meniscus posterior root tears (MMPRTs) is associated with contemporaneous clinical scores and progression of cartilage damage. However, the relationship among these scores, midterm clinical scores and magnetic resonance imaging (MRI) evaluations is unknown. The relationship between the second-look arthroscopic score at 1 year and the clinical scores or MRI at 3 years was evaluated.

Methods: Sixty-three patients were included. Medial meniscus extrusion (MME) was evaluated preoperatively and at 3 years postoperatively. Clinical scores were evaluated preoperatively, and 1 and 3 years postoperatively. Meniscal healing status was assessed using the semiquantitative second-look arthroscopic score at 1 year postoperatively. Correlation coefficients between patient characteristics, postoperative clinical scores or second-look arthroscopic score and the change in MME (ΔMME) were evaluated. Multiple regression analysis was performed on the ΔMME to evaluate the effects of patient characteristics and second-look arthroscopic scores.

Results: No significant correlation was observed between patient characteristics and ΔMME. In contrast, a significant correlation was found between the second-look arthroscopic score and ΔMME ($p < 0.001$) and visual analogue scale pain score ($p = 0.016$) at 3 years postoperatively. In the subitems of the second-look arthroscopic score, width ($p < 0.001$) and stability ($p = 0.009$) scores also showed significant correlations with ΔMME. Multiple regression analysis showed a significant association between the second-look arthroscopic score and ΔMME ($p = 0.001$).

Conclusion: The second-look arthroscopic score at 1 year postoperatively correlated with the ΔMME and clinical score at 3 years postoperatively. Second-look arthroscopic scores predict midterm meniscal function after pullout repair of MMPRTs.

Level of evidence: Level IV.

BACK

More than 3 mm of preoperative medial meniscal extrusion is identified as a key risk factor for varus progression in limb alignment after arthroscopic repair of medial meniscus posterior root tear

K.H. Yoon, B.S. Bae

DOI: https://doi.org/10.1002/ksa.12232

Purpose: To investigate the risk factors for varus progression after arthroscopic medial meniscal posterior root tear (MMPRT) repair and to compare the clinical outcomes between two groups: one with more varus progression and the other with less varus progression.

Methods: Patients who underwent isolated arthroscopic repair of MMPRT between 2015 and 2020 were enroled, and 2-year follow-up data were collected. Participants were categorized into two groups based on preoperative values of the weight-bearing line (WBL) ratio: group A with <5.9% increase and group B with ≥5.9% increase. Various factors, including demographic features and radiological findings, were analysed and compared between the two groups. Intra-meniscal signal intensity, meniscal healing, medial meniscal extrusion (MME), and articular cartilage grade were assessed preoperatively and 1-year postoperatively using coronal magnetic resonance imaging.

Results: The final cohort consisted of 34 patients in group A and 46 in group B, with a mean age of 55.8 ± 11.2 and 59.8 ± 6.6 years, respectively. Preoperative WBL ratio and cartilage lesions in the medial compartment did not differ between the groups. Preoperative MME were significantly lower in group A than those in group B (2.6 ± 0.6 mm in group A and 3.5 ± 0.7 mm in group B, $p < 0.05$). Patient-reported outcomes at the 2-year follow-up did not differ between the two groups (n. s.). In a logistic analysis, the odds ratio of MME was 2.1 ($p < 0.05$), and the cutoff value of MME was 3.02 mm.

Conclusion: Preoperative MME is a risk factor for varus progression. However, no differences in patient-reported outcomes were observed at 2-year follow-up, even in the group with greater varus progression.

Level of evidence: Level IV.

BACK

Save the subchondral bone plate: Debridement versus bone marrow stimulation in acetabular cartilage defects over 60 months of follow-up

M. Riedl, J.E. Lenz

DOI: https://doi.org/10.1002/ksa.12375

Purpose: Bone marrow stimulation is a common treatment for full-thickness cartilage defects in the hip joint. However, common procedures may result in poor fibrous repair tissue and changes to the subchondral anatomy. This study investigated the clinical outcome of a cohort of International Cartilage Repair Society (ICRS) grades 3 and 4 cartilage defects treated with bone marrow stimulation compared to those who received simple debridement/chondroplasty.

Methods: In this retrospective registry study, 236 patients with uni-focal acetabular chondral lesions of the hip up to 400 mm² (mean 177.4 ± 113.4 mm²) and of ICRS grade ≥3 with follow-up of at least 12 months (mean 33.2 ± 15.3 months) were included. Eighty-one patients underwent bone marrow stimulation (microfracture: $n = 44$, abrasion: $n = 37$) besides treatment of the underlying pathology, 155 patients underwent defect debridement/chondroplasty. The patient-reported outcome was measured using the International Hip Outcome Tool 33 (iHOT33) score and the Visual Analogue Scale (VAS) for pain.

Results: iHOT33 and VAS both improved highly statistically significantly ($p < 0.001$) in the debridement group after 6, 12, 24, 36 and 60 months compared to the preoperative scores, whereas iHOT33 and VAS after microfracture or abrasion did not show statistically significant changes over time. Twenty-four and sixty months postsurgery the debridement group revealed significant higher scores in the iHOT33 compared to the bone marrow stimulation groups.

Conclusion: Patients with chondral lesions of the hip ≤400 mm^2 sustainably benefit from arthroscopic debridement under preservation of the subchondral bone plate in terms of functional outcome and pain in contrast to patients treated with bone marrow stimulation. These findings discourage the currently recommended use of microfracture in the hip joint.

Level of evidence: Level III.

BACK

The severity of preoperative bone marrow oedema negatively influences short-term clinical outcomes following arthroscopic bone marrow stimulation for osteochondral lesions of the talus

Y.-B. Li, X.-Z. Fan

DOI: https://doi.org/10.1002/ksa.12355

Purpose: The purpose of this study was to study the effects of the severity of preoperative bone marrow oedema (BME) on the postoperative short-term outcomes following bone marrow stimulation (BMS) for osteochondral lesions of the talus (OLTs) and to propose a new metric that combines volume and signal density to evaluate BME.

Methods: Sixty-five patients with symptomatic OLTs (<100 mm^2) and preoperative BME, who received BMS in our institution from April 2017 to July 2021 with follow-ups of 3, 6 and 12 months, were analysed retrospectively. The area, volume and signal value of the BME were collected on preoperative magnetic resonance imaging. The enroled patients were divided into two groups according to the BME index (BMEI), which was defined as the product of oedema relative signal intensity and the relation of oedema volume to total talar volume. Visual analogue scale, American Orthopedic Foot and Ankle Society (AOFAS), Tegner, Foot and Ankle Ability Measure (FAAM)–activities of daily living (ADL) and Sports scores were assessed before surgery and at each follow-up. The relationship between the scores and the volume, relative signal intensity and BMEI was explored.

Results: Sixty-five patients with preoperative BME were divided into the mild ($n = 33$) and severe ($n = 32$) groups based on the BMEI. A significant difference was found for each score with the general linear model for repeated measures through all follow-up time points ($p < 0.001$). For the preoperative and 12-month postoperative changes of the enroled patients, 53 patients (81.5%) exceeded the minimal clinically important difference of AOFAS and 26 (40.0%) exceeded that of FAAM-sports in this study. The mild group showed significantly more improvement in AOFAS scores at 12 months (89.6 ± 7.0 vs. 86.2 ± 6.2) and FAAM-ADL scores at 6 months (83.6 ± 7.6 vs. 79.7 ± 7.7) and 12 months (88.5 ± 8.5 vs. 84.4 ± 7.7) than the severe group ($p < 0.05$). No significant difference of all the scores between the groups was found at 3 months. No significant correlation was found in each group between BMEI and clinical outcomes.

Conclusion: The severity of the preoperative BME negatively affected short-term clinical outcomes following arthroscopic BMS for OLTs. Worse clinical outcomes were shown at postoperative 6 and 12 months in patients with a high preoperative BMEI, which could be a favourable parameter for assessing the severity of BME and assist in developing personalised rehabilitation plans and determining the approach and timing of surgery.

Level of evidence: Level III.

BACK

Knee flexor strength at 6 months after anterior cruciate ligament reconstruction using hamstring tendon can be predicted from that at 3 months

T. Sengoku, J. Nakase

DOI: https://doi.org/10.1002/ksa.12370

Purpose: This study aimed to identify factors influencing persistent muscle weakness in knee flexor strength after anterior cruciate ligament (ACL) reconstruction using the hamstring tendon and establish a clear cut-off value at 3 months postoperatively for the limb symmetry index (LSI) to exceed 90% at 6 months postoperatively.

Methods: One hundred forty-eight patients undergoing ACL reconstruction were included and categorised into two groups based on knee flexor strength at 6 months postoperatively: patients with LSI of 90% or greater (achieved group: $n = 114$) and patients with LSI less than 85% (nonachieved group: $n = 34$). Items with significant differences between the two groups (preoperative waiting period, LSI to body weight ratio of knee flexor and extensor strength at 3 months postoperatively and peak torque angle of knee flexor muscle) were included in the multiple logistic regression analysis. Additionally, a receiver operating characteristic curve was used to calculate the cut-off value of the LSI at 3 months postoperatively, which was required to achieve the LSI criteria for knee flexor strength 6 months postoperatively.

Results: Multiple logistic regression analysis extracted the preoperative waiting period and LSI for knee flexor strength at 3 months postoperatively. The cut-off value at 3 months postoperatively was 76.9% (area under the curve value, 0.82; sensitivity, 0.76; and specificity, 0.81) of the LSI.

Conclusion: The LSI of at least 76.9% for knee flexor strength at 3 months after ACL reconstruction was an indicator for achieving the 6 months postoperatively. This is a criterion to aim for, considering the stress on the graft and the regeneration process of the semitendinosus tendon.

Level of evidence: Level III.

BACK

American Journal of Sports Medicine (AJSM), Volume 52, Issue 11

Ten-Year Outcomes in Patients Aged 40 Years and Older After Primary Arthroscopic Treatment of Femoroacetabular Impingement With Labral Repair

B.G. Domb, J.S. Owens

DOI: https://doi.org/10.1177/03635465241270291

Background: Arthroscopic labral repair has been shown to result in favorable short- and midterm outcomes; however, the durability of outcomes specifically in older patients remains underreported.

Purpose: To (1) report prospectively collected hip preservation rates and patient-reported outcome measures (PROMs) at a minimum 10-year follow-up in patients aged ≥40 years after primary hip arthroscopy with labral repair and (2) perform a matched analysis comparing patients aged ≥40 years with patients aged <40 years.

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

Methods: Data were prospectively collected and retrospectively reviewed on all patients who underwent primary hip arthroscopy between February 2008 and December 2011. Patients aged ≥40 years who underwent labral repair were included. Preoperative and minimum 10-year follow-up scores were collected for multiple PROMs. Propensity score matching was utilized to compare these patients with a cohort of patients <40 years.

Results: Of the 113 hips eligible, 91 hips (80.5%) on 85 patients (6 bilateral) had a minimum 10-year follow-up. There were 58 women (68%) and 27 men (32%) with a mean age and body mass index of 47.8 years and 25.8, respectively. The hip preservation rate for patients aged ≥40 years was 78%, with 20 patients requiring arthroplasty during the study period. There was significant improvement in all PROMs from baseline to minimum 10-year follow-up with high rates of achieving the minimal clinically important difference and Patient Acceptable Symptom State clinical outcome thresholds. In total, 69 patients aged ≥40 years were propensity matched to 107 patients <40 years. Patients ≥40 tended to have a lower hip preservation rate (81.2% vs 91.6%; P = .06), while patients in the younger cohort had significantly higher rates of secondary hip arthroscopy (14% vs 3%; P = .02). Improvement in PROMs was comparable between the groups.

Conclusion: Patients ≥40 years who underwent primary hip arthroscopy with labral repair demonstrated a hip preservation rate of 78%, significant and durable improvement in PROMs, and high rates of satisfaction at a minimum 10-year follow-up. Matched analysis with patients <40 years revealed comparable improvement in patient-reported outcomes between the 2 groups, with a tendency to a higher level of arthroplasty in patients ≥40 years.

BACK

Reduced Knee Flexion Strength 18 Years After ACL Reconstruction With Hamstring Tendon Versus Patellar Tendon

M. Popovic, J.R. Myhre

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Background: Bone–patellar tendon–bone (BPTB) and double-looped semitendinosus and gracilis (hamstring) grafts are commonly used for anterior cruciate ligament (ACL) reconstruction. Short-term and midterm studies show little or no differences between the 2 grafts; however, there are only a few long-term studies to compare results between the 2 grafts.

Purpose: To compare the results after using either BPTB grafts or hamstring tendon grafts 18 years after ACL reconstruction.

Study Design: Randomized controlled trial; Level of evidence 2.

Methods: A total of 114 patients with ACL rupture between 2001 and 2004 were randomized to reconstruction with either a BPTB graft or a hamstring tendon graft. Patients were operated on at 4 major hospitals. The 18-year follow-up evaluation included anterior knee laxity measured with a KT-1000 arthrometer, defined as the primary outcome, while clinical examination (Lachman and pivot-shift tests), isokinetic testing of muscle strength, patient-reported outcome measures, and an assessment of radiographic osteoarthritis using the Kellgren-Lawrence classification were defined as secondary outcomes.

Results: A total of 96 patients (84%, 47 BPTB and 49 hamstring grafts) were available for follow-up, 71 of these for clinical examination. Seven of 96 patients were excluded for ACL revision (n = 5) or knee replacement (n = 2) surgery. In total, 25 patients (10 BPTB and 15 hamstring grafts) had undergone additional surgery other than ACL revision or total knee arthroplasty. There were no significant differences between the groups in terms of anterior laxity test with KT-1000 arthrometer (primary outcome). In secondary outcomes, no significant differences between groups were reported regarding clinical examination, patient-reported outcome scores, or radiographic osteoarthritis (Kellgren-Lawrence grade 2-4 for patellofemoral joint [18 hamstring and 14 BPTB] or tibiofemoral joint [20 hamstring and 19 BPTB]), while isokinetic testing revealed that the hamstring group had a 10.7% reduction in mean peak flexion torque compared with the BPTB group at 60 deg/s (df = 59; P = .011). At 60 deg/s the mean total flexion work in the hamstring group was reduced by 17.2% compared with the BPTB group (df = 59; P = .002).

Conclusion: The flexion strength in the hamstring group was significantly reduced in the operated knee after 18 years. There were no significant differences between the groups regarding subjective outcomes, patient-reported outcomes, range of motion, clinical and instrumented knee laxity, and the development of osteoarthritis.

BACK

Characteristics and Outcomes of Operatively Treated Discoid Lateral Meniscus in Pediatric and Young Adult Patients: A Multicenter Study

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Background: Discoid lateral meniscus (DLM) is the most common congenital abnormality of the meniscus. Tears are common; treatment is frequently not definitive, often requiring reoperation.

Purpose: To report the clinical manifestations, physical characteristics, operative treatments and findings, complications, and reoperations of DLM in pediatric patients from multiple centers across North America.

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

Methods: Consecutive patients who underwent treatment for symptomatic DLM at 9 institutions between 2000 and 2020 were included. Patient data, presenting symptoms and signs, surgical findings, treatments rendered, and postoperative complications, including reoperation rates, were collected. Means with ranges and counts with proportions are reported for continuous and categorical variables, respectively, and comparisons were made using either the chi-square or Fisher exact test.

Results: In total, 784 patients (867 knees) were included with a mean age at diagnosis of 12 years (range, 1-22 years) and a mean follow-up of 22.6 months (range, 0-154 months). Common preoperative symptoms were locking (33%) and snapping (30%). At surgery, tears in the DLM were present in 647 knees (594 patients [76%]); 95 knees (11%) had multiple tears; and in 140 knees, tears extended into >1 zone. Tears, when present, were more common within the posterior horn (41%) or body (34%) than the anterior horn (25%). Peripheral rim instability was reported in 241 knees (28%). Significantly more knees had instability posteriorly (15%; P = .0004) and anteriorly (9%; P = .0013) than along the body (3%). Tear type was most commonly complex (38%) or horizontal (34%). A total of 358 knees in 333 patients with tears (42% of all patients) underwent repair (55% of knees with tears). A total of 175 complications were reported, occurring in 139 knees in 134 patients (17%); 116 of these knees with complications (83%) had a single complication, while 23 (17%) had >1. Of the 784 patients, 105 (13%) underwent reoperation, undergoing 135 additional procedures related to their DLM. Of those, 60 (44%) were repeat arthroscopy and meniscal trim; 40 (30%), arthroscopy and meniscal repair; and 17 (13%), an articular cartilage procedure.

Conclusion: Locking and snapping were common presenting symptoms. Over three-quarters of patients had meniscal tears, which were most often complex and located posteriorly. Seventeen percent of patients experienced complications, and a sixth of patients with complications had >1. Reoperation was typically for persistent symptoms or meniscal retear.

BACK

Negative Pain Thoughts Questionnaire Short Form (NPTQ-SF) Scores and Outcomes After Arthroscopic Meniscectomy

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Background: Pain is multifactorial, and pain intensity has been shown to be influenced by patients' thoughts. The Negative Pain Thoughts Questionnaire Short Form (NPTQ-SF) can be used to quantify unhelpful negative cognitive biases about pain, but the relationship between negative pain thoughts and orthopaedic surgery outcomes is not known.

Purpose: To evaluate the prevalence of negative pain thoughts in patients undergoing arthroscopic meniscectomy using the NPTQ-SF survey and assess the relationship these thoughts have to knee function, general health, pain, and satisfaction before and after surgery.

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

Methods: In total, 146 patients undergoing arthroscopic meniscectomy were administered the 4-item NPTQ-SF, 12-item Short Form Survey (SF-12), International Knee Documentation Committee (IKDC) questionnaire, and visual analog scale pain survey preoperatively between July 2021 and August 2022. The same surveys were completed at a minimum of 3 months and no later than 1 year postoperatively by 92 patients confirmed to have undergone meniscectomy.

Results: NPTQ-SF scores were correlated with IKDC, SF-12, and satisfaction score preoperatively and at least 3 months postoperatively (mean, 108.5 ± 43.7 days). Preoperative NPTQ-SF scores were significantly negatively correlated with postoperative IKDC ($R = -0.284$), SF-12 ($R = -0.266$ and -0.328), and visual analog scale pain ($R = 0.294$) scores, while a relationship with postoperative satisfaction did not reach statistical significance ($P = .067$). Patients with a preoperative NPTQ-SF score >8 were less likely to achieve a Patient Acceptable Symptom State on the postoperative IKDC questionnaire (39% vs 63%; $P = .03$). Patients with a history of a psychiatric or chronic pain diagnoses have worse NPTQ-SF, SF-12, and IKDC scores pre- and postoperatively.

Conclusion: The level of negative pain thoughts in patients undergoing meniscectomy is related to knee function, general health, and pain. Patients with a high level of negative pain thoughts are less likely to achieve a favorable outcome from meniscectomy, with a score ≥8 representing a clinically significant threshold for preoperative screening.

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Journal of Bone and Joint Surgery (JBJS), Volume 106, Issue 19+20

No Lower Extremity Abstracts

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Clinical Orthopaedics and Related Research (CORR), Volume 482, Issue 9

No Lower Extremity Abstracts

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Bone and Joint Journal (BJJ), Volume 106-B, issue 9

No Lower Extremity Abstracts

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Miscellaneous

Arthroscopy, Volume 40, Issue 9

No Miscellaneous Abstracts

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Journal of Shoulder and Elbow Surgery (JSES), Volume 33, issue 9

No Miscellaneous Abstracts

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Knee Surgery, Sports Traumatology, Arthroscopy (KSSTA), Volume 32, Issue 9

Movement-based cognitive training does not significantly shorten the learning curve for acquiring arthroscopic basic skills

P.S. Alt, D. Hamacher

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Purpose: Skilful arthroscopy requires an aboveaverage level of manual dexterity. It is evident that particular motor skills can be learned and trained before arthroscopic training. The aim of this prospective cohort study was to investigate the impact of movement-related cognitive training on the learning curve during arthroscopic basic training.

Methods: Fifty right-handed participants without arthroscopic experience were matched to an intervention group ($n = 25$) and a control group ($n = 25$). Prior to basic arthroscopic skill training with a simulator, the intervention group underwent 12 weeks of movement-related cognitive training. Cognitive and motor skills were assessed in both groups by using standardised tests (CogniFit test, angle reproduction test, two-arm coordination test) as a pretest and, for the intervention group, again before arthroscopic training as a posttest. For arthroscopic simulator training, three tasks ('Telescoping', 'Periscoping', 'Triangulation') from the Fundamentals of Arthroscopic Surgery Training module were selected and practiced 10 times with the camera in the right and left hands. The learning progress was quantified by exercise time, camera path length and hook path length.

Results: No significant differences in sex distribution, age distribution or the results of the pretests between the intervention group ($n = 21$) and the control group ($n = 25$) were found (n.s.). The intervention group improved significantly from the pretest to the posttest in the CogniFit ($p = 0.003$) and two-arm coordination test in terms of time ($p < 0.001$) and errors ($p = 0.002$) but not in the angle reproduction test. No significant differences were found between the groups for the three arthroscopic tasks.

Conclusion: The hypothesis that movement-related cognitive training shortens the learning curve for acquiring arthroscopic basic skills cannot be confirmed. Other factors influencing the learning curve such as talent, teaching method and motivation have a greater impact on the acquisition of complex motor skills.

Level of evidence: Level II.

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American Journal of Sports Medicine (AJSM), Volume 52, Issue 11

No Miscellaneous Abstracts

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Journal of Bone and Joint Surgery (JBJS), Volume 106, Issue 19+20

No Miscellaneous Abstracts

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Clinical Orthopaedics and Related Research (CORR), Volume 482, Issue 9

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Bone and Joint Journal (BJJ), Volume 106-B, issue 9

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