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Upper extremity

Arthroscopy, Volume 38, Issue 12

Graft Healing Is More Important Than Graft Technique: Superior Capsular Reconstruction Versus Bridging Grafts—A Prospective Randomized Controlled Trial

Y. Ono, J. LeBlanc, et al.

DOI: https://doi.org/10.1016/j.arthro.2022.06.033

Purpose
To compare superior capsular reconstruction (SCR) versus bridging graft (BG) for massive irreparable rotator cuff tears (RCTs).
Methods
A prospective double-blind randomized study was conducted to compare SCR versus BG for massive irreparable RCTs. Fifty patients (mean age: 60.2 ± 6.0 years) with chronic tears (mean duration of symptoms: 5 ± 5.2 years) were intraoperatively randomized following partial repair to SCR or BG using human dermal allograft. All patients underwent standardized rehabilitation and were followed at 3, 6, 12, and 24 months clinically and radiographically. Magnetic resonance imaging were obtained at 12 months to determine graft integrity.

Results
At 2 years, 46 patients were available for follow-up. Mean American Shoulder and Elbow Surgeons (ASES), Western Ontario Rotator Cuff (WORC), and Quick Disabilities of the Arm, Shoulder and Hand scores were 74.8 ± 23.9, 66.0 ± 28.3, and 24.7 ± 26.1 for the SCR group, and 77.9 ± 19.9, 69.5 ± 24.5, and 25.0 ± 19.1 for the BG group, respectively, with no significant difference between groups. Magnetic resonance imaging demonstrated 18 of 24 (75%) in the SCR group and 14 of 22 (64%) in the BG group were intact at 12 months (P = .53). Patients with intact grafts compared with those with retorn grafts, whether SCR or BG, had greater ASES and WORC scores at 24 months (ASES 81.0 ± 18.7 vs 65.7 ± 24.4, P = .021 and WORC 72.3 ± 24.6 vs 53.7 ± 26.7, P = .04) and greater acromiohumeral intervals on radiographs at all follow-up time points.

Conclusions
When performing arthroscopic reconstruction using human dermal allograft for an irreparable RCT, whether the proximal edge of the graft is attached on the glenoid bone or to the torn tendon does not significantly change short-term clinical and radiographic outcomes.

Level of Evidence
I, therapeutic.

BACK

Arthroscopic Debridement for Refractory Lateral Epicondylitis Results for Substantial Improvement in Tendinosis Scores and Good Clinical Outcomes: Qualitative and Quantitative Magnetic Resonance Imaging Analysis

S. Miyamura, K. Temporin, et al.

DOI: https://doi.org/10.1016/j.arthro.2022.07.019

Purpose
To qualify and quantify the changes in magnetic resonance imaging (MRI) signals in the extensor tendons after arthroscopic debridement for lateral epicondylitis and evaluate the association between MRI findings and temporal clinical results by comparisons between recovered and unrecovered cases.

Methods
Thirty-four patients with refractory lateral epicondylitis treated with arthroscopic debridement were divided into recovered (n = 24) and unrecovered (n = 10) groups according to the Japanese Orthopaedic Association-Japan Elbow Society score. This study included any patients who underwent both the pre- and postoperative MRI and excluded patients with a previous history of any elbow surgery. Pre- and postoperative MRI findings were qualitatively categorized into 4 grades, quantified by measuring the percentage of tendinopathy area, and compared between the groups.

Results
Preoperatively, grading scores and percentages did not show significant differences between groups (P = .050 and .519). The respective numbers of patients with grades 1, 2, 3, and 4 were 1 (4%), 3 (13%), 10 (42%), and 10 (42%) in the recovered group; and 1 (10%), 2 (20%), 7 (70%), and 0 (0%) in the unrecovered group. The average percentages in the recovered and unrecovered groups were 42.3% (73.9 mm2/168.4 mm2); and 36.5% (50.5 mm2/131.0 mm2). However, postoperatively, they were significantly lower in the recovered group than in the unrecovered group (P = .007 and .014). The numbers and percentages in the recovered and unrecovered groups were 15 (63%), 8 (33%), 1 (4%), and 0 (0%) and 17.0% (28.6mm2/169.8mm2) and 2 (20%), 3 (30%), 5 (50%), and 0 (0%) and 30.5% (39.0 mm2/131.8 mm2).

Conclusions
Qualitative and quantitative MRI is useful for evaluating the progress of tendon healing after arthroscopic debridement. In the recovered and unrecovered groups, improvement of tendinopathy area were 60% versus 16%, indicating that postoperative MRI findings reflect clinical outcomes.

Level of Evidence
IV, case series with subgroup analysis.

BACK

Acetabular Cartilage Lesions Predict Inferior Mid-Term Outcomes for Arthroscopic Labral Repair and Treatment of Femoroacetabular Impingement Syndrome

D.S. Carreira, D.B. Shaw, et al.

DOI: https://doi.org/10.1016/j.arthro.2022.05.013

Purpose

To analyze the effect of acetabular chondrosis at a minimum of 2 years following hip arthroscopy in patients undergoing labral repair and treatment of femoroacetabular impingement.

Methods

From 2014 to 2017, patients undergoing arthroscopic labral repair were prospectively enrolled in a multicenter hip arthroscopy registry. The registry was retrospectively queried for primary labral repair patients with complete 2-year outcomes and a Tonnis grade of less than 2. Patients were grouped according to severity of articular cartilage damage noted intraoperatively using the Beck classification system: none, low-grade (Grade 1 or 2), or high-grade (Grade 3 or 4) damage. A Kruskal-Wallis test and post hoc Dunn's test with Holm correction compared 2-year postoperative outcome scores of the iHOT-12 scale between groups. The proportion of patients in each cohort who achieved the clinically significant thresholds of the minimum clinically important difference (MCID), patient-acceptable symptom scale, and substantial clinical benefit (SCB) were analyzed. Multivariate logistic regression models identified predictors of achieving clinical thresholds while controlling for demographic variation.

Results

422 patients met inclusion criteria, from which 347 completed 2-year outcomes. All groups experienced improvement in iHOT-12 scores from baseline to follow-up ($P < .001$). iHOT-12 scores at follow-up were inferior for Low-Grade Damage and High-Grade Damage Groups relative to the No Damage Group ($P = .04$; $P = .03$). When accounting for age, body mass index, gender, and preoperative iHOT-12 scores in logistic regression models, the presence of high-grade lesions was a negative predictor for achieving SCB (OR [95% CI], 0.54 [0.29-0.96]) and low-grade lesions a negative predictor for achieving MCID (0.50 [0.27-0.92]. Among patients with high-grade lesions, there was no significant difference in 2-year iHOT-12 scores between those undergoing chondroplasty (n = 50) and those undergoing microfracture (n = 14) ($P = .14$).

Conclusions

Acetabular cartilage damage portends inferior patient-reported outcomes 2 years after primary labral repair and treatment of femoroacetabular impingement. The presence of cartilage lesions was a negative predictor of individual achievement of several clinical thresholds.

Level of Evidence

III, Retrospective comparative cohort.

BACK

Journal of Shoulder and Elbow Surgery (JSES), Volume 31, issue 12, pages p2514-p2520

Clinical course in patients with chronic undifferentiated arthritis of the elbow after arthroscopic synovectomy

Jae Woo Shim, Sang Hoon Chae, et al.

DOI: https://doi.org/10.1016/j.jse.2022.07.011

Background
Surgical treatment can be considered for patients with undifferentiated arthritis (UA) limited to the elbow joint. The purpose of this study was to analyze the clinical outcomes of arthroscopic synovectomy.

Methods
Nineteen patients who underwent arthroscopic synovectomy for chronic UA of the elbow between 2006 and 2019 were enrolled in this study. One patient was excluded because of evidence of tuberculosis in the biopsy. Chronic UA of the elbow was defined as (1) localized synovitis diagnosed by magnetic resonance imaging, (2) no specific cause, and (3) no response to conservative treatment for >3 months. We compared baseline characteristics and clinical outcomes between the remission and disease progression groups.

Results
Postoperatively, synovitis was controlled in 13 patients. In 5 patients, the symptoms disappeared after surgery without any medical treatment. Four patients discontinued disease-modifying antirheumatic drugs. Nine patients were classified as in remission. The disease progression group had a longer symptom duration, elevated rheumatoid markers, and higher Larsen grading. However, the difference was not statistically significant.

Conclusion
Arthroscopic synovectomy achieved remission in approximately 47% of patients with chronic UA of the elbow. Although arthroscopic synovectomy did not prevent RA, it can be considered for rapid resolution of synovitis and diagnostic purposes.

Level of evidence
Level IV, Case Series, Treatment Study

BACK

Arthroscopic revision cuff repair: do tendons have a second chance to heal?
Michel Azar, Olivier van der Meijden, et al.

DOI: https://doi.org/10.1016/j.jse.2022.04.024

Background
Few studies have investigated postoperative tendon integrity after reoperation for failed rotator cuff repair. The purpose of this study was to evaluate the anatomic and clinical outcomes of arthroscopic revision rotator cuff repair (AR-RCR) and identify the risk factors related to re-retear.

Methods
Sixty-nine consecutive patients (mean age, 55 years) with primary failed open (38%) or arthroscopic (62%) cuff repairs underwent AR-RCR and were reviewed regarding clinical examination findings and imaging studies. Patients with massive cuff tears and upward humeral migration (acromiohumeral distance < 6 mm) or glenohumeral osteoarthritis were excluded. Revision repair was performed by a single, experienced shoulder surgeon. Complete footprint coverage was achieved in all cases using a single-row (70%), double-row (19%), or side-to-side (11%) technique. The primary outcome measure was tendon healing assessed with magnetic resonance imaging (57 cases) or computed tomography arthrogram (12 cases) performed at minimum 1-year follow-up. Secondary outcome measures included functional outcome scores, subjective results, and complications. The mean follow-up period was 43 months (range, 12-136 months).

Results
The cuff tendons did not heal to the tuberosity in 36% of the shoulders (25 of 69) following revision cuff surgery. Absence of tendon healing was associated with poorer shoulder function (average Constant score, 69 ± 20 vs. 54 ± 18; $P = .003$) and a decreased Subjective Shoulder Value (72% vs. 54%, $P = .002$). Factors that were negatively associated with tendon healing were age ≥ 55 years (odds ratio [OR], 4.5 [95% confidence interval, 1.6-12.5]; $P = .02$), tendon retraction of stage 2 or higher (OR, 4.4 [95% confidence interval, 1.4-14.3]; $P = .01$), and fatty infiltration index > 2 (OR, 10.2; $P < .0001$). No differences in retear rates were found between single-row and double-row cases. In 36 shoulders, tissue samples were harvested and submitted for bacteriologic culture analysis; 13 (36%) showed positive findings for infection (*Cutibacterium acnes* in 12 of 13) and associated antibiotic treatment was given. Overall, 25% of patients had unsatisfactory clinical results and 22% were disappointed or dissatisfied. At last follow-up, 4 patients (5.7%) underwent reoperations, with a second AR-RCR in 1 and conversion to reverse shoulder arthroplasty in 3.

Conclusion
Despite careful patient selection and intraoperative complete footprint coverage, in this study the tendons did not heal to bone in 36% of cases after revision cuff surgery. The absence of tendon healing is associated with poorer clinical and subjective results. Patients aged ≥ 55 years and patients with larger tears (stage 2 or higher) and/or muscle fatty infiltration (fatty infiltration index > 2) have significantly lower rates of healing. Surgeons should be aware that structurally failed cuff repair may also be associated with low-grade infection.

Level of evidence
Level IV, Case Series, Treatment Study

BACK

Two-year outcomes with a bioinductive collagen implant used in augmentation of arthroscopic repair of full-thickness rotator cuff tears: final results of a prospective multicenter study

Brandon D. Bushnell, Patrick N. Connor, et al.

DOI: https://doi.org/10.1016/j.jse.2022.05.025

Background

Full-thickness rotator cuff tears (FTRCTs) represent a common shoulder injury that, if untreated, can progress in size, become increasingly painful, and inhibit function. These lesions are often surgically repaired, with double-row arthroscopic repair often preferred for larger tears. Biological augmentation technologies have been developed to improve rates of postoperative radiographic retear and enhance patient-reported outcomes after surgical FTRCT repair. This study sought to confirm that augmented repair with a bioinductive bovine collagen implant results in favorable retear rates and patient outcomes with follow-up to 2 years.

Methods

A prospective multicenter cohort study was undertaken to determine the efficacy and safety of augmenting single- or double-row arthroscopic repair of FTRCTs with a bioinductive bovine collagen implant. Of 115 adult patients participating, 66 (57.4%) had medium (1-3-cm) tears and 49 (42.6%) had large (3-5-cm) tears. Magnetic resonance imaging and patient-reported outcomes (American Shoulder and Elbow Surgeons Standardized Shoulder Assessment Form [ASES] and Constant-Murley Score [CMS]) were performed and recorded at baseline, 3 months, 1 year, and 2 years.

Results

Mean duration of follow-up was 2.1 years (range, 1.5-2.9 years). Between baseline and 2-year follow-up, mean total thickness of the supraspinatus tendon increased by 12.5% for medium tears and by 17.1% for large tears. Radiographic retear was noted in 7 of 61 available patients (11.5%) with medium tears, and in 14 of 40 patients (35.0%) with large tears. In both groups, these tears primarily occurred before the 3-month follow-up visit (13 of 21 [61.9%]). Radiographic retear with the supplemented double-row (DR) repair technique was 13.2% overall (12 of 91 DR patients; 11.3% for medium tears and 15.8% for large tears). The minimal clinically important difference was achieved by >90% of patients with both medium and large tears for both ASES and CMS. There were 2 serious adverse events classified by the treating surgeon as being possibly related to the device and/or procedure (1 case of swelling/drainage and 1 case of intermittent pain). Nine patients (7.8%; 4 medium tears and 5 large tears) required reoperation of the index rotator cuff surgery.

Conclusion

Final 2-year data from this study confirm that using this implant in augmentation of arthroscopic double-row repair of FTRCTs provides favorable rates of radiographic retear and substantial functional recovery. The relative safety of the device is also further supported.

Level of evidence

Level IV, Case Series, Treatment Study

BACK

Can the Single Assessment Numeric Evaluation be used as a stand-alone subjective outcome instrument in patients undergoing rotator cuff repair?

Keith M. Baumgarten

DOI: https://doi.org/10.1016/j.jse.2022.05.017

Background

There is no consensus to which patient-determined shoulder outcome scores should be considered when analyzing patient outcomes. Use of multiple patient-determined outcomes may be redundant and cause increased responder burden. The Single Assessment Numeric (SANE) has not been widely accepted as a stand-alone shoulder-specific outcome measure. The hypothesis was that SANE will correlate with and be comparable in responsiveness to other subjective outcome measures that have been used in a stand-alone fashion in patients undergoing rotator cuff repair (American Shoulder and Elbow Surgeons Standardized Shoulder Assessment Form [ASES], Western Ontario Rotator Cuff Index [WORC], and the Simple Shoulder Test [SST]). In addition, the SANE will be more relevant to each patient compared to the ASES, further supporting its use as a stand-alone shoulder-specific outcomes measure.

Methods

A retrospective review of a database of patients undergoing rotator cuff repair was reviewed where the SANE was recorded with the ASES, WORC, and/or SST. Correlations were determined using the Pearson coefficient. Subgroup analysis was performed to determine if correlations differed in (1) preoperative and (2) postoperative outcome determinations. Responsiveness was determined by calculating the standardized response mean (SRM) and the effect size (ES) of all scores. Relevance and precision of the SANE and ASES were examined using 150 consecutive patients to determine the number of questions in each score that were not answered.

Results

Correlation was excellent for the SANE and the ASES (n = 1838, $r = 0.81$, $P < .0001$), the WORC (n = 1793, $r = 0.82$, $P < .0001$), and the SST (n = 1836, $r = 0.76$, $P < .0001$). Correlation of preoperative scores was moderate and postoperative scores were excellent when comparing the SANE with all 3 scores. All scores were highly responsive, with the SRM of the SANE = 2.1, ASES = 2.2, WORC = 2.4, and the SST = 1.8. The ES of the SANE = 2.4, ASES = 2.7, WORC = 3.0, and the SST = 2.1. One hundred percent of the SANE scores were answered completely compared with 57% ($P < .0001$) of the ASES, with significant variability found in the answers to the “work” and “score” questions.

Conclusion

In patients undergoing rotator cuff repair, the SANE highly correlated and has equivalent responsiveness with the WORC, ASES, and SST, which have been used as stand-alone shoulder-specific outcomes measures. The SANE may provide the same information as the WORC, ASES, and SST regarding outcome with significant reduction in responder burden. This study supports that the SANE can be used as a subjective, stand-alone instrument for patients undergoing rotator cuff repair.

Level of evidence

Basic Science Study, Validation of Outcome Instruments

BACK

Arthroscopic double-button Latarjet osteolysis and remodeling at 1-year follow-up
Yoann Dalmas, Charles-Edouard Thélu et al.

DOI: https://doi.org/10.1016/j.jse.2022.04.004

Hypothesis
The aim of this study was to evaluate the osteolysis rate, graft remodeling, and risk factors for osteolysis at the 1-year threshold after an arthroscopic Latarjet procedure with double-button fixation.

Methods
In this multicenter, retrospective study, postoperative computed tomography scans obtained after an arthroscopic Latarjet procedure with double-button fixation to treat anterior shoulder instability were analyzed at 15 days and at 3, 6, and 12 months. Graft volume, dimensions, and morphologic remodeling were analyzed.

Results
Twenty-seven patients were included (mean age, 26 years). At 1 year, osteolysis occurred in 19 of 27 patients (70%). The volume initially decreased until 6 months' follow-up (−35%; range, −75% to +26%) and then increased until our last follow-up. At 1 year, the graft volume decreased by 17% (range, −61% to +56%) compared with the immediate postoperative volume. In multivariate analysis, the rate of osteolysis was inversely associated with an unhealed graft at 3 months (P = .02; β coefficient = −44.50 [95% confidence interval, −81 to −8]). The maximal height of the graft significantly grew 0.2 cm (range, −55 to +124 mm) (P = .015). In the sagittal plane, osteolysis occurred in the superior part in 100% of patients (27 of 27) whereas bone formation occurred in the inferior part. In the axial plane, osteolysis occurred in the anterior part whereas bone formation occurred in the posterior part. In the articular part, the observed remodeling was aimed to obtain a new anatomic and congruent glenoid.

Conclusion
At 1 year after an arthroscopic Latarjet procedure with double-button fixation, osteolysis occurred in 70% of patients. The rate of osteolysis was 17% of the initial volume. Osteolysis occurred mainly during the first 6 months, in the anterior and superior parts. Remodeling led to a circular anatomic glenoid. This osteolysis did not cause any recurrence of instability or require revision surgery.

Level of evidence
Level IV, Case Series, Treatment Study

BACK

American Journal of Sports Medicine (AJSM), Volume 50, Issue 14

Distance to Dislocation and Recurrent Shoulder Dislocation After Arthroscopic Bankart Repair: Rethinking the Glenoid Track Concept

Aaron E. Barrow MD, Shaquille J.-C. Charles MSc, Mohamad Issa MD, Ajinkya A. Rai BS, Jonathan D. Hughes MD, Bryson P. Lesniak MD, Mark W. Rodosky MD, Adam Popchak PhD, Albert Lin MD

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https://doi.org/10.1177/03635465221128913

Background: The “distance to dislocation” (DTD) calculation has been proposed as 1 method to predict the risk of recurrent dislocation after arthroscopic Bankart repair for an “on-track” shoulder. Rates of recurrent dislocation at specific DTD values are unknown.

Hypothesis: Among patients with “on-track” shoulder lesions who underwent primary arthroscopic Bankart repair, the rate of recurrent dislocation would increase as DTD values decrease.

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

Methods: We performed a retrospective analysis of 188 patients with “on-track” shoulder lesions who underwent primary arthroscopic anterior labral repair between 2007 and 2019, with a minimum 2-year follow-up. Glenoid bone loss, Hill-Sachs interval, glenoid track, and DTD were determined from preoperative magnetic resonance imaging scans. The rate of recurrent dislocation was determined at 2-mm DTD intervals. Univariate and multivariate regression analyses were used to evaluate the relationship between recurrent dislocation, patient characteristics, and bone loss variables. A multivariate regression model was created to predict the probability of failure at continuous DTD values. A subgroup analysis of failure rate based on collision sports participation was also performed.

Results: A total of 29 patients (15.4%) sustained recurrent dislocations. Patient age ($P = .046$), multiple dislocations ($P = .03$), glenoid bone loss ($P < .001$), Hill-Sachs interval length ($P < .001$), and DTD ($P < .001$) were all independent predictors of failure. As the DTD decreased, the rate of recurrent dislocation increased. Below a DTD threshold of 10 mm, the recurrent dislocation rate increased exponentially. Up to a threshold of 24 mm, the failure rate for collision athletes remained >12.3%, independent of the DTD. Conversely, the failure rate among noncollision athletes decreased steadily as the DTD increased.

Conclusion: For “on-track” shoulder lesions, as the DTD approached 0 mm (“off-track” threshold), the risk of recurrent dislocation after arthroscopic Bankart repair increased significantly. Below a DTD threshold of 10 mm, the risk of failure increased exponentially. The risk of recurrent dislocation for collision sports athletes remained elevated at higher DTD values than for noncollision athletes.

BACK

Clinical Outcomes After Arthroscopic Pancapsular Shift for the Treatment of Multidirectional Glenohumeral Instability at a Mean Follow-up of 9 Years

Jordan A. Gruskay MD, Dylan R. Rakowski MD, Thomas E. Woolson BA, Marilee P. Horan MPH, Peter J. Millett MD, MSc

First published November 2, 2022; pp. 3897–3906

https://doi.org/10.1177/03635465221127293

Background: Arthroscopic treatment of multidirectional instability (MDI) of the shoulder is being increasingly performed, but there is a paucity of studies with minimum 5-year follow-up.

Purpose: To report on survivorship and patient-reported outcomes (PROs) after arthroscopic pancapsulorraphy (APC) for MDI with a minimum 5-year follow-up.

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

Methods: Institutional review board approval was obtained before initiation of this retrospective review of prospectively collected data. Patients were included if they had a minimum of follow-up 5 years after APC for MDI. PROs included the 12-Item Short Form Health Survey Physical Component Summary; American Shoulder and Elbow Surgeons; Single Assessment Numeric Evaluation; shortened version of Disabilities of the Arm, Shoulder and Hand; and patient satisfaction. Preoperative, short-term (1-2 years), and final follow-up PROs were compared. Recurrent instability, dislocation, and reoperation were collected, and survivorship analysis was performed.

Results: A total of 49 shoulders in 44 patients (15 male, 29 female) treated between October 2005 and November 2015 were included in the study. MDI onset was atraumatic in 27 shoulders and traumatic in 22. Rotator interval closure was performed in 17 patients. Overall, 14 of 49 (29%) patients reported feelings of instability in the shoulder, of whom 5 (10.2%) underwent revision surgery at a mean of 1.5 years. Kaplan-Meier analysis demonstrated a survivorship rate of 88% at 5 years and 82% at 8 years, with failure defined as requiring revision surgery or postoperative feelings of instability with ASES score <65. Final outcome analysis was performed on 41 shoulders with a mean follow-up of 9.0 years (range, 5.1-14.6 years). All PROs demonstrated significant improvement from preoperative baseline ($P < .05$) and remained significantly improved at both short-term and long-term final follow-up. There was no difference in PROs based on \\ atraumatic versus traumatic onset, or patients treated with a rotator interval closure. There was a significant difference in PROs between patients who had continued instability.

Conclusion: APC for the treatment of MDI provided reasonable, durable long-term PROs that persisted from short-term follow-up. Although 29% of patients experienced feelings of instability at final follow-up, most of these patients still had high postoperative satisfaction and acceptable PROs.

BACK

Effect of Fatty Infiltration of the Infraspinatus Muscle on Outcomes and Graft Failure After Arthroscopic Superior Capsule Reconstruction for Irreparable Posterosuperior Rotator Cuff Tears

Jun-Bum Lee MD, Erica Kholinne MD, PhD, Ji Woong Yeom MD, Hui Ben MD, PhD, Basim Masoud AlAhmadi MD, PhD, Kyung-Hwan Koh MD, PhD, In-Ho Jeon MD, PhD

First published November 7, 2022; pp. 3907–3914

https://doi.org/10.1177/03635465221130459

Background: Superior capsule reconstruction (SCR) was developed as an alternative treatment for irreparable rotator cuff tears to restore superior stability of the glenohumeral joint. Although fatty infiltration (FI) of the rotator cuff muscles, especially the infraspinatus, has been implicated as a predictor of outcomes and graft integrity after rotator cuff repair, it has not been fully investigated in cases of SCR.

Purpose: To evaluate the effect of FI of the infraspinatus muscle on clinical and radiological outcomes after SCR.

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

Methods: A total of 55 consecutive patients with irreparable posterosuperior rotator cuff tears who underwent SCR between January 2013 and August 2020 were included retrospectively. Preoperative and postoperative clinical and radiological findings (median follow-up of >2 years), including magnetic resonance imaging results, were thoroughly reviewed. The patients were divided into 2 groups: group 1 with mild FI of the infraspinatus (Goutallier grades 0-2) and group 2 with severe FI of the infraspinatus (Goutallier grades 3-4). The American Shoulder and Elbow Surgeons score, Constant score, visual analog scale score for pain, and range of motion were evaluated. Acromiohumeral distance and rotator cuff tear arthropathy using the Hamada classification were assessed on plain radiography. Postoperative graft integrity was evaluated by magnetic resonance imaging. Graft failure was defined as complete discontinuity. Univariate and multivariable logistic regression analyses were performed to evaluate clinical and radiological findings that might be associated with successful SCR.

Results: Clinical and radiological outcomes significantly improved after SCR. Graft failure was noted in 15 (27.3%) patients and was more frequent in group 2 than in group 1 (50.0% vs 14.3%, respectively; P = .004). Univariate analysis indicated a significant association between severe FI in the infraspinatus (group 2) and graft failure after SCR (odds ratio, 6.00 [95% CI, 1.65-21.80]; P = .006). Multivariable analysis indicated that FI of the infraspinatus was the only factor associated with graft failure (odds ratio, 6.37 [95% CI, 1.63-24.90]; P = .008).

Conclusion: Severe FI of the infraspinatus muscle was a factor indicating a poor prognosis for graft integrity after SCR. Preoperative evaluation of FI in the rotator cuff muscles can help predict postoperative outcomes and may help guide therapeutic options.

BACK

Journal of Bone and Joint Surgery (JBJS), Volume 104, Issue 23

Arthroscopic Rotator Cuff Repair with and without Acromioplasty in the Treatment of Full-Thickness Rotator Cuff Tears: Long-Term Outcomes of a Multicenter, Randomized Controlled Trial.

Woodmass JM, Al Khatib L, McRae S, Lapner P, Mascarenhas R, Neogi D, MacDonald PB

DOI: https://doi.org/10.2106/jbjs.22.00135

Background: The aim of this study was to reevaluate patients from a previous randomized controlled trial at a long-term follow-up to determine the long-term efficacy of subacromial decompression in patients with full-thickness rotator cuff tears.

Methods: This is a secondary study based on a previous, multicenter, randomized controlled trial with patients allocated to arthroscopic rotator cuff repair with or without acromioplasty. The original study was conducted between 2003 and 2011, and the secondary study was conducted between 2015 and 2021. Patients were invited by a blinded assessor to return to complete the Western Ontario Rotator Cuff (WORC) index and a questionnaire about reoperation and to undergo a clinical assessment. If participants were unable to return, they were asked to complete the questionnaires by mail. A chart review on all participants in the original study was conducted.

Results: Eighty-six patients were randomized in the original trial, with 31 of 45 from the group without acromioplasty and 25 of 41 from the acromioplasty group returning for long-term follow-up. The mean duration (and standard deviation) of follow-up was 11.2 ± 2.4 years for the group without acromioplasty and 11.5 ± 2.6 years for the acromioplasty group. There was no significant difference in WORC scores between the groups with and without acromioplasty at the time of the long-term follow-up ($p = 0.30$). Seven (16%) of the 45 patients in the group without acromioplasty underwent reoperation. One (2%) of the initial 41 patients allocated to acromioplasty underwent reoperation. All patients who underwent a reoperation had a Type-2 or 3 acromion.

Conclusions: Patients who underwent rotator cuff repair with or without acromioplasty experienced improvement of outcomes from their preoperative level at a long-term follow-up (mean, 11 years), and there were no differences in patient-reported outcomes, specifically WORC scores, between these groups. However, a significantly higher reoperation rate was observed in patients who had rotator cuff repair without acromioplasty, specifically in those with a Type-2 or 3 acromion.

Level of evidence: Therapeutic Level I. See Instructions for Authors for a complete description of levels of evidence.

BACK

Lower Extremity

Arthroscopy, Volume 38, Issue 12

Risk of Postoperative Stiffness Following Multiligamentous Knee Injury Surgery Is Not Affected by Obesity: A Multicenter Study

A.D. Bi, E.S. Mojica, et al.

DOI: https://doi.org/10.1016/j.arthro.2022.06.017

Purpose
The purpose of this study was to examine the relationship between obesity and postoperative stiffness following surgical management of multiligamentous knee injuries (MLKIs) using a large two-center cohort, by both 1) using binary cutoffs at various body mass indexes (BMIs) and 2) a linear regression model.

Methods
190 consecutive patients who underwent surgical management of MLKIs between January 2001 and March 2020 were reviewed at two level 1 academic trauma centers. Patient demographics, surgical characteristics, and manipulation under anesthesia (MUA)/lysis of adhesions (LOA) were reviewed. Patients were stratified by obesity grades: grade 1 (BMI 30 to <35) grade 2 (BMI 35 to <40); grade 3 (BMI >40), and compared with a nonobese comparison group with BMI <30. Multivariate logistic regressions were performed, including the covariates of age, gender, BMI, acute versus chronic injury, external fixator, vascular injury, knee dislocation, and Schenck Classification. Fisher's exact test was used to compare rate of MUA between grades of obesity. Analyses were performed with R. Statistical significance was set at $P < .05$.

Results
The mean BMI of the cohort was 29.2 kg/m2. The mean overall follow-up was 27.2 ± 7.2 months (range: 14–142 months). There were 55 (29.1%) MUA procedures observed at a mean 3.77 ± 2.18 months (range: 1.8–9.7 months) after final MLKI surgery. No significant difference was found in BMI of patients who underwent a MUA compared to patients who did not (30.2 vs 28.8; $P = .67$). There was no significant difference in rate or time to MUA following MLKI surgery between groups, with logistic regression demonstrating no significance ($P = .144$). Use of external fixation at the index surgery (OR = 3.3 [95% CI: 2.2, 4.7; $P < .0001$]) and vascular injury (OR = 6.2 [95% CI: 1.8, 24.5; $P = .005$]) were found to be independent predictors for need for MUA.

Conclusion
No difference in risk for postoperative stiffness requiring MUA following surgery for MLKI was found based on BMI. At all BMI levels, there were no significant increase in need for postoperative MUA, suggesting at minimum a neutralizing effect of obesity on postoperative stiffness. In addition, patients with external fixator use and vascular injury at index surgery were found to be at significantly higher risk for postoperative stiffness requiring MUA following surgery for MLKI. Surgeons should be aware of the risk factors for arthrofibrosis when proceeding with surgical repair or reconstruction of two or more ligaments of the knee.

Level of Evidence
III, multicenter retrospective cohort study.

BACK

Perioperative Thromboprophylaxis Is Associated With Lower Risk of Venous Thromboembolism After Knee Arthroscopy

J.T. Holler, M. Salesky, et al.

DOI: https://doi.org/10.1016/j.arthro.2022.06.034

Purpose

To determine the rate of symptomatic venous thromboembolism (VTE) among patients undergoing arthroscopic knee procedures, risk factors associated with postoperative VTE, and current perioperative thromboprophylaxis prescription patterns associated with this population in the United States.

Methods

Medical records for patients ≥18 years of age were queried from the Mariner database using Current Procedural Terminology codes for knee arthroscopy performed in the United States from 2010 to 2020 in this cross-sectional study. Patients who received thromboprophylaxis and those diagnosed with VTE, including deep-vein thrombosis or pulmonary embolism, within 90 days of surgery were identified using International Classification of Diseases and National Drug Codes. Two multivariable logistic regression models were used to identify VTE risk factors and likelihood of perioperative thromboprophylaxis. Covariates included procedure type, age, oral contraceptive pill (OCP) use, and medical comorbidities.

Results

A total of 718,289 patients met inclusion criteria and 7,618 patients (1.06%) experienced VTE, including deep-vein thrombosis (n = 6,394, 0.9%) and/or pulmonary embolism (n = 2,211, 0.3%). A total of 10,769 patients (1.5%) filled perioperative thromboprophylaxis, including aspirin (n = 5,353, 0.7%), low-molecular-weight heparin (n = 4,563, 0.6%), and oral factor Xa inhibitors (n = 947, 0.1%). Perioperative thromboprophylaxis was associated with decreased odds of experiencing VTE (adjusted odds ratio [aOR] 0.65, 95% confidence interval [CI] 0.51-0.80). Procedure types categorized as moderate-to-greater risk were associated with increased odds of VTE (aOR 1.42, 95% CI 1.34-1.50). OCP use (aOR 1.63, 95% CI 1.38-1.91), obesity (aOR 1.17, 95% CI 1.11-1.24), renal disease (aOR 1.33, 95% CI 1.18-1.50) and congestive heart failure (aOR 1.30, 95% CI 1.13-1.50) were associated with increased odds of VTE.

Conclusions

While the overall rate of symptomatic VTE following knee arthroscopy remains low, procedure types that are more complex and generally require restrictive rehabilitation protocols, OCP use, obesity, renal disease, and congestive heart failure are associated with increased odds of postoperative VTE. Conversely, the use of perioperative thromboprophylaxis is associated with significantly lower VTE risk.

Level of Evidence

III, retrospective comparative prognostic trial.

BACK

The Influence of Psychosocial Factors on Hip Surgical Disorders and Outcomes After Hip Arthroscopy: A Systematic Review

A. Hall, N. Dandu, et al.

DOI: https://doi.org/10.1016/j.arthro.2022.05.003

Purpose

To systematically review the associations between mental health and preoperative or postoperative outcomes of hip arthroscopy for femoroacetabular impingement.

Methods

The literature search was conducted using the PubMed, EMBASE and PsychINFO databases following the PRISMA (Preferred Reporting Items for Systematic Reviews and Meta-analyses) guidelines.

Results

Nine studies were identified that met the inclusion and exclusion criteria. All studies assessing patient-reported outcomes found significantly lower patient-reported outcomes (modified Harris Hip Score, Hip Outcome Score–Activities of Daily Living, Hip Outcome Score–Sports-Specific Subscale, and International Hip Outcome Tool scores) related to worse mental health functioning before surgery. Specifically, preoperative Hip Outcome Score–Activities of Daily Living and Hip Outcome Score–Sports-Specific Subscale were significantly greater in control patients than patients in the mental health group by 11.6 points (mean difference; 95% confidence interval 7.58-15.79, $P < .001$) and 10 points (95% confidence interval 5.14-14.87, $P < .001$), without significant heterogeneity between studies ($I2 = 28.59$, $P = .25$; $I2 = 0$, $P = .93$), respectively. Patients with lower mental health status also had lower rates of achieving a minimal clinically important difference in 5 studies included in this review.

Conclusions

This systematic review finds consistent evidence supporting the association between negative psychological function and worse preoperative and postoperative outcomes for patients with hip disorders. Understanding both the effect of mental health on surgical outcomes and the potential benefits of psychological intervention may represent an opportunity to improve patient outcomes following hip arthroscopy.

Level of Evidence

IV, systematic review of Level II-IV studies.

BACK

Increased Risk of Concomitant Meniscal Injuries in Adolescents With Elevated Body Mass Index After Anterior Cruciate Ligament Tear: A Systematic Review

A.C.H. Ang, D. Wong, et al.

DOI: https://doi.org/10.1016/j.arthro.2022.05.004

Purpose

To investigate existing studies examining the association between body mass index (BMI) and outcomes of anterior cruciate ligament reconstruction (ACLR) in adolescent patients.

Methods

A literature search was conducted on PubMed and Embase. Studies examining associations between BMI and outcomes after ACLR in adolescents were included. Quality assessment was performed. Data on patient age, sex, study design, time of follow-up, sample size, graft type, concomitant injuries (meniscal injury, surgical procedures), clinical outcomes (revision ACLR, postoperative weight gain, post-traumatic osteoarthritis [PTOA], range of motion [ROM]), and functional outcome (muscle strength) were extracted.

Results

Eleven papers of Levels II-IV evidence were included. Five studies found positive correlations between BMI and risk of concomitant meniscal injuries. Two of them reported young patients with elevated BMI having 1.6 times greater odds of requiring meniscectomy ($P < .01$) and 1.031 times greater odds of requiring concomitant surgeries ($P = .011$). One study showed significant positive association of postoperative weight gain by time ($r = 0.28$, $P < .01$), with smaller increase in the overweight and obese groups compared with the normal-weight group. One study demonstrated greater cartilage breakdown in young patients with overweight and obesity postsurgery, contributing to PTOA ($r = 0.42$, $P = .009$). There was no clinically important difference in postoperative ROM and muscle strength. Four studies reviewed the association between BMI and revision ACLR risk, but results were heterogeneous and a firm conclusion cannot be drawn.

Conclusions

Adolescents with elevated BMI are more likely to have concomitant meniscal injuries and surgical procedures after ACL tear. There is some weak evidence of the association of elevated BMI with PTOA and slight postoperative weight gain post-ACLR. There may not be any clinically significant association of obesity with post-operative muscle strength and ROM, and current studies are inconclusive regarding the impact of BMI on revision ACLR risk.

Level of Evidence

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

BACK

Knee Surgery, Sports Traumatology, Arthroscopy (KSSTA), Volume 30, Issue 12, Pages p4134-4143

A tailored intervention does not reduce low value MRI's and arthroscopies in degenerative knee disease when the secular time trend is taken into account: a difference-in-difference analysis

T. Rietbergen, P. J. Marang-van de Mheen et al.

DOI: https://doi.org/10.1007/s00167-022-06949-w

Purpose
To evaluate the effectiveness of a tailored intervention to reduce low value MRIs and arthroscopies among patients ≥ 50 years with degenerative knee disease in 13 Dutch orthopaedic centers (intervention group) compared with all other Dutch orthopaedic centers (control group).

Methods
All patients with degenerative knee disease ≥ 50 years admitted to Dutch orthopaedic centers from January 2016 to December 2018 were included. The tailored intervention included participation of clinical champions, education on the Dutch Choosing Wisely recommendation for MRI's and arthroscopies in degenerative knee disease, training of orthopaedic surgeons to manage patient expectations, performance feedback, and provision of a patient brochure. A difference-in-difference analysis was used to compare the time trend before (admitted January 2016–June 2017) and after introduction of the intervention (July 2017–December 2018) between intervention and control hospitals. Primary outcome was the monthly percentage of patients receiving a MRI or knee arthroscopy, weighted by type of hospital.

Results
136,446 patients were included, of whom 32,163 were treated in the intervention hospitals. The weighted percentage of patients receiving a MRI on average declined by 0.15% per month ($\beta = -0.15$, $P < 0.001$) and by 0.19% per month for arthroscopy ($\beta = -0.19$, $P < 0.001$). However, these changes over time did not differ between intervention and control hospitals, neither for MRI ($\beta = -0.74$, $P = 0.228$) nor arthroscopy ($\beta = 0.13$, $P = 0.688$).

Conclusion
The extent to which patients ≥ 50 years with degenerative knee disease received a MRI or arthroscopy declined significantly over time, but could not be attributed to the tailored intervention. This secular downward time trend may reflect anoverall focus of reducing low value care in The Netherlands.

Level of evidence
III

BACK

Age, male sex, higher posterior tibial slope, deep sulcus sign, bone bruises on the lateral femoral condyle, and concomitant medial meniscal tears are risk factors for lateral meniscal posterior root tears: a systematic review and meta-analysis

Meng Wu, Jin Jiang et al.

DOI: https://doi.org/10.1007/s00167-022-06967-8

Purpose

Lateral meniscus posterior root tears (LMPRTs) are commonly found in patients with anterior cruciate ligament (ACL) injuries. However, risk factors for LMPRTs are not well known. This study was designed to systematically review the available evidence regarding risk factors associated with LMPRTs.

Methods

The PubMed, EMBASE, Cochrane Library, and Web of Science databases were searched for papers containing the key words “lateral meniscus posterior root tears”, “LMPRTs” and “risk factor”. Inclusion screening, data extraction, and quality assessment of the included articles were conducted independently by two authors. Statistical analysis was conducted to determine risk factors for LMPRTs.

Results

Seventeen studies with a total sample size of 6, 589 patients were identified. The pooled prevalence of LMPRTs was 9.6% (range, 5.1–33.8%) for ACL injury. Significant risk factors included a patient age of < 30 [OR = 1.4, 95% CI (1.07, 1.84), $p = 0.01$], male sex [OR = 1.50, 95% CI (1.24,1.81), $p = 0.01$], higher body mass index (BMI) [MD = 0.45, 95% CI (0.13, 0.76), $p < 0.01$], higher lateral posterior tibial slope (LPTS) [MD = 2.22, 95% CI (1.37, 3.07), $p < 0.01$], deep sulcus sign [OR = 5.76, 95% CI (1.35, 24.52), $p < 0.01$] and bone bruises on lateral femoral condyle [OR = 4.88, 95% CI (1.27, 18.77), $p < 0.01$], lateral meniscal extrusion > 1 mm [OR = 5.56, 95% CI (1.52, 20.29), $p < 0.01$] and > 3 mm [OR = 12.91 95% CI (1.28, 130.01), $p < 0.01$], medial meniscal tears [OR = 1.40, 95% CI (1.12, 1.75), $p < 0.01$], and medial ramp lesions [OR = 2.29, 95% CI (1.35, 3.89), $p < 0.01$].

Conclusion

Age below 30, male, higher BMI, higher LPTS, deep sulcus sign, bone bruises on lateral femoral condyle, lateral meniscal extrusion, medial meniscal tear, and medial ramp lesion are risk factors for LMPRTs.

Level of evidence

IV

BACK

Superior results of return to sport after double-bundle versus single-bundle anterior cruciate ligament reconstruction in young active patients

Liang Qin, Hongbo You et al.

DOI: https://doi.org/10.1007/s00167-022-07010-6

Purpose

To compare return to sport and clinical results in young active patients who underwent anatomic single-bundle (SB) versus double-bundle (DB) anterior cruciate ligament reconstruction (ACLR).

Methods

Young active patients undergoing SB or DB ACLR from 2017 to 2019 at our institution were retrospectively reviewed. The primary outcome measures were the rate and time to return to sports, with secondary measures including the Lachman test, pivot shift test, Lysholm scores, International Knee Documentation Committee (IKDC) scores and graft rupture.

Results

The study included a total of 90 patients (DB group, 42; SB group, 48), with a mean follow-up of 27.1 ± 6.1 months. Young active patients who underwent DB ACLR had a higher rate of return to pivoting sports than those who underwent SB ACLR (HR = 2.4; 95% confidence interval [CI]: 1.4, 4.1; $p = 0.013$). The DB group returned to pivoting sports at a mean ± SD of 11.0 ± 2.9 months compared with 12.7 ± 2.7 months in the SB group ($p = 0.01$). There was one traumatic failure in the SB group and one contralateral ACL rupture in the DB group. There was no significant difference in the rate and time to return to running, Lachman test, pivot-shift test, Lysholm or IKDC scores in either group.

Conclusion

Both anatomical SB and DB techniques achieved satisfactory clinical outcomes. DB techniques led to superior performance of return to pivoting sports but nonsignificant differences in time and rate of return to running, passive stability measurement, subjective knee function outcome and graft rupture rate in both groups at the 2-year follow-up. The DB ACLR should be considered a viable option to treat young patients with high activity demands.

Level of evidence

III

BACK

Generalized joint hypermobility does not influence 1-year patient satisfaction or functional outcome after ACL reconstruction

David Sundemo, Melker Svärd Jacobsson et al.

DOI: https://doi.org/10.1007/s00167-022-07008-0

Purpose

The purpose of this study was to evaluate whether generalized joint hypermobility (GJH) influences postoperative results, including return to sport, patientreported outcomes, functional performance (hop tests), muscular strength, and the occurrence of ACL re-injury, in patients 1 year after anterior cruciate ligament (ACL) reconstruction.

Methods

Data was extracted from a regional rehabilitation-specific registry containing information on patients with ACL injury. Patients between the ages of 16–50 years previously undergoing ACL reconstruction with available 1 year follow-up data were eligible for inclusion. Generalized joint hypermobility was assessed using the Beighton score (BS). Patients were examined one year postoperatively in terms of return to sport, patient-reported outcome, hop tests, muscular strength and the occurrence of reinjury. For purpose of analysis, patients were allocated into two groups, depending on the existence of GJH. The KOOS subscale of sports and recreation was considered the primary outcome. Analyses were performed both dichotomously and by using adjusted logistic regression, to consider potential confounders.

Results

A total of 356 patients (41% males) were included, of which 76 (24% male) were categorized as having GJH. Patients with GJH had an inferior limb symmetry index preoperatively in terms of knee extension (mean 81.6 [SD 16.4] vs. 91.4 [SD 15.9], $p = 0.02$) and flexion strength (mean 91.9 vs. 99.1, $p = 0.047$) compared to patients without GJH. There was no difference between the groups in terms of the primary outcome, nor in any of the other postoperative outcomes. Nine patients (11.8%) in the group with GJH suffered ACL re-injury, compared with 13 patients (4.6%) in the control group (n.s.).

Conclusion

One year after ACL reconstruction the existence of GJH did not affect postoperative patient satisfaction, strength or functional outcome. No conclusive statements can be made regarding the influence of GJH on the risk of ACL re-injury in this particular study.

Level of evidence

II

BACK

Anatomic reconstruction using the autologous gracilis tendon achieved less sprain recurrence than the Broström-Gould procedure but delayed recovery in chronic lateral ankle instability

Tong Su, Yi-chuan Zhu et al.

DOI: https://doi.org/10.1007/s00167-022-07011-5

Purpose

To compare the return-to-activity and long-term clinical outcomes between anatomic lateral ligament reconstruction using the autologous gracilis tendon and modified Broström-Gould (MBG) procedure in chronic lateral ankle instability (CLAI). It was hypothesised that there was no difference between the two techniques.

Methods

From 2013 to 2018, 30 CLAI patients with grade III joint instability confirmed by anterior drawer test underwent anatomic reconstruction of lateral ankle ligament with the autologous gracilis tendon (reconstruction group) in our institute. Another 30 patients undergoing MBG procedure (MBG group) were matched in a 1:1 ratio based on demographic parameters. The post-operative American Orthopaedic Foot and Ankle Society (AOFAS) score, visual analogue scale (VAS) pain score, Tegner activity score, Karlsson–Peterson score, surgical complications, return-to-activities and work were retrospectively evaluated and compared between the two groups.

Results

All subjective scores significantly improved after the operation (all with $p < 0.001$) without difference between the two groups (all n.s.). The MBG group showed a significantly higher proportion of postoperative sprain recurrence than the reconstruction group (26.7% vs. 0, $p = 0.002$). The reconstruction group showed a significantly longer period to start walking with full weight-bearing (10.5 ± 6.9 vs. 7.0 ± 3.1 weeks, $p = 0.015$), jogging (17.1 ± 8.9 vs. 12.7 ± 6.9 weeks, $p = 0.043$) and return-to-work (13.5 ± 12.6 vs. 8.0 ± 4.7 weeks, $p = 0.039$) than the MBG group.

Conclusion

Both anatomic reconstruction using the autologous gracilis tendon and MBG procedure could equally achieved reliable long-term clinical outcomes and the tendon reconstruction showed a relatively lower incidence of postoperative sprain recurrence but delayed recovery to walking, jogging and return-to-work. The MBG procedure was still the first choice with rapid recovery but the tendon reconstruction was recommended for patients with higher strength demand.

Level of evidence

III

BACK

Anterior ankle impingment syndrome is less frequent, but associated with a longer absence and higher re-injury rate compared to posterior syndrome: a prospective cohort study of 6754 male professional soccer players

Pieter D'Hooghe, Markus Waldén et al.

DOI: https://doi.org/10.1007/s00167-022-07004-4

Purpose

To study the epidemiology and return to play characteristics of anterior and posterior ankle impingement syndromes (AAIS and PAIS) over 18 consecutive seasons in male professional soccer players.

Methods

Between the 2001–2002 and 2018–2019 seasons, 120 European soccer teams were followed prospectively for various seasons. Time loss injuries and player exposures were recorded individually in 6754 unique players. Injury incidence and burden were reported as the number of injuries and days absence per 1000 h with 95% confidence intervals (CIs). Injury severity was reported as median absence in days with the interquartile range (IQR).

Results

Out of 25,462 reported injuries, 93 (0.4%) were diagnosed as AAIS (38%) or PAIS (62%) in 77 players. AAIS and PAIS were similar regarding injury characteristics except for a greater proportion of AAIS having a gradual onset (69% vs.47%; $P = 0.03$) and being re-injuries (31% vs. 9%; $P = 0.01$). Impingement syndromes resulted in an overall incidence of 0.03 injuries (95% CI 0.02–0.03) per 1000 h and an injury burden of 0.4 absence days per 1000 h. PAIS incidence was significantly higher than that for AAIS [0.02 (95% CI 0.002–0.03) vs. 0.01 (95% CI 0.005–0.01) injuries per 1000 h (RR = 1.7). The absence was significantly longer in AAIS than in PAIS [10 (22) vs. 6 (11) days; $P = 0.023$]. Impingement syndromes that presented with a gradual onset had longer absences in comparison to impingement with an acute onset [8 (22) vs. 5 (11) days; $P = 0.014$]. Match play was associated with a higher incidence and greater injury burden than training: 0.08 vs. 0.02 injuries per 1000 h (RR 4.7), respectively, and 0.9 vs. 0.3 days absence per 1000 h (RR 2.5).

Conclusion

Ankle injuries are frequent in men's professional soccer and ankle impingement is increasingly recognized as a common source of pain, limited range of motion, and potential time loss. In our study, ankle impingement was the cause of time loss in less than 0.5% of all injuries. PAIS was more frequently reported than AAIS, but AAIS was associated with more absence days and a higher re-injury rate than PAIS. The findings in this study can assist the physician in best practice management on ankle impingment syndromes in professional football.

Level of evidence

II

BACK

American Journal of Sports Medicine (AJSM), Volume 50, Issue 14

Posterior Horn Lateral Meniscal Oblique Radial Tear in Acute Anterior Cruciate Ligament Reconstruction Incidence and Outcomes After All-Inside Repair: Clinical and Second-Look Arthroscopic Evaluation

Young-Sik Jeon MD, Khalid Alsomali MD, Seong Wook Yang MD, Oei Jong Lee MD, Byoungyoul Kang MD, Joon Ho Wang MD, PhD

First published November 2, 2022; pp. 3796–3804

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Background: The term posterior horn lateral meniscal oblique radial tear (LMORT) has emerged to characterize the tear patterns of the lateral meniscus in many patients with acute anterior cruciate ligament (ACL) injury. There is a lack of data regarding the exact incidence according to the types of LMORT and clinical outcomes.

Purposes: (1) To investigate the incidence of LMORT according to type in patients with acute ACL reconstruction (ACLR) and (2) to identify healing status after repair of LMORT via second-look arthroscopy and clinical outcomes.

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

Methods: Patients who underwent primary ACLR within 6 months of injury were retrospectively reviewed. The LMORT was classified into 4 types based on the severity and distance from the root: type 1 (partial tear <10 mm from the root), type 2 (complete tear <10 mm from the root), type 3 (partial tear >10 mm from the root), type 4a (complete tear >10 mm from the root), and type 4b (type 4a with longitudinal tear at the meniscocapsular junction). Only patients with LMORT were isolated, and the clinical outcomes were compared according to the healing status of LMORT in second-look arthroscopy.

Results: Of 635 patients with ACLR, LMORT was identified in 97 patients (15.3%), and type 4 LMORT accounted for the largest proportion (n = 62; 32.6%) of 190 lateral meniscal tears. In 79 patients with LMORT who satisfied the 2-year follow-up period, all patient-reported outcomes (PROs), including the Lysholm (preoperative, 64.1; postoperative, 88.2) and International Knee Documentation Committee subjective (preoperative, 50.5; postoperative, 82.9) scores, were significantly improved ($P < .001$) 31.8 months postoperatively. Of the 61 patients who underwent second-look arthroscopy, 49 (80.3%) were classified into the complete healing group. There was no significant difference in postoperative PROs between the complete and partial healing groups.

Conclusion: The incidence of LMORT was 15.3% in patients with acute ACL injury, and type 4 LMORT was the most common type. Complete healing of LMORT was achieved in 80.3% of patients who underwent second-look arthroscopy, and the PROs were significantly improved postoperatively. Good clinical results can be achieved if the LMORT is repaired as much as possible during ACLR.

BACK

Arthroscopic Treatment of Symptomatic Discoid Lateral Meniscus and Nondiscoid Meniscus in Adolescent Patients

Lisa Su MD, Abbie Bennett MS, Kristen Combs MD, Timothy W. Torrez MD, Derek C. Pham, Nicholas, J. Jackson PhD, MPH, Richard E. Bowen MD, Jennifer J. Beck MD

First published November 7, 2022pp. 3805–3811

https://doi.org/10.1177/03635465221130455

Background: Discoid lateral meniscus (DLM) is a rare condition. Patient-reported outcomes using validated instruments are underreported in the literature. DLM outcomes have not been directly compared with nondiscoid meniscus (non-DLM) in adolescent patients.
Purpose/Hypothesis:
This study sought to analyze the difference in patient characteristics, surgical treatment, and patient-reported outcomes for adolescent patients arthroscopically treated for symptomatic DLM and non-DLM pathology. We hypothesized that DLM and non-DLM patient-reported outcomes would be similar.

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

Methods: A retrospective review of patients aged <18 years with symptomatic DLM and non-DLM pathology was completed between 2015 and 2021 at a single academic institution. Chart reviews for patient characteristics and surgical operative indications and technique were completed. Patient-reported outcome scores were prospectively collected preoperatively and at 6 months, 1 year, and 2 years after surgery.

Results: Patients in the DLM group (n = 48), when compared with the non-DLM group (n = 45), were younger (12.71 vs 15.78 years, respectively; P < .001) and had lower body mass index (24.53 vs 28.91, respectively; P < .02). Both groups were majority Hispanic and more commonly male (DLM 65% vs non-DLM 60%). All of the DLM patients had surgery on the lateral discoid meniscus (n = 48), whereas the non-DLM group had surgery on the lateral meniscus (n = 37), medial meniscus (n = 7), or both (n = 1). A majority of patients in both groups underwent meniscal repair (DLM 73% and non-DLM 62%), and there was no difference in surgical treatment between groups (P > .05). A statistically significant improvement was seen in International Knee Documentation Committee (IKDC) and Physical Activity Questionnaire (PAQ) scores from the preoperative assessment to 6 months, 1 year, and 2 years after surgery for both DLM and non-DLM groups (P < .05). No difference was found in scores between DLM and non-DLM groups, between sexes, or between age groups (<13 years or ≥13 years) (P > .05).

Conclusion: Although patients with DLM were younger and had lower body mass index, the IKDC and PAQ scores were not significantly different between the DLM and non-DLM groups. Both groups showed a significant improvement in scores relative to their preoperative scores. Sex and age did not affect IKDC or PAQ scores.

BACK

Venous Thromboembolism Chemoprophylaxis in Knee Arthroscopy: A Break-Even Analysis of Cost

Brandon J. Martinazzi BS, Gregory J. Kirchner MD, MPH, F. Jeffrey Lorenz BS, Vincenzo Bonaddio MD, Shawn Hines MD, Raymond Y. Kim MD, Robert A. Gallo MD, MHA

First published November 3, 2022; pp. 3832–3837

https://doi.org/10.1177/03635465221130990

Background: Symptomatic venous thromboembolism (VTE) is a serious and costly complication after knee arthroscopy. There continues to be debate regarding the use of VTE prophylaxis after knee arthroscopy, and minimal research has explored its cost-effectiveness.

Hypothesis: Both aspirin and enoxaparin would be cost-effective in preventing symptomatic VTE.

Study Design: Economic and decision analysis; Level of evidence, 3.

Methods: The literature was searched and the TriNetX research database was queried to determine a range of initial rates of VTE. An open-access retail database was used to determine the mean retail price for aspirin (325 mg) and enoxaparin (30 mg and 40 mg). Our institutional records were used to determine the cost of treating VTE. A “break-even” analysis was then performed to determine the absolute risk reduction necessary to make these drugs cost-effective. This value was then used to calculate the number of patients who would need to be treated (NNT) to prevent a single VTE while still breaking even on cost.

Results: The cost of treating VTE was $9407 (US Dollars). Aspirin (325 mg), enoxaparin (30 mg), and enoxaparin (40 mg) were found to cost $1.86, $188.72, and $99.99, respectively. The low, TriNetX, and high rates of VTE were 0.34%, 0.86%, and 10.9%, respectively. Aspirin was cost-effective at all 3 rates if the initial rate decreased by 0.02% (NNT = 5058). Both formulations of enoxaparin were cost-effective at the high initial rate if they decreased by 2.01% (NNT = 50) and 1.06% (NNT = 94), respectively. However, at the low and TriNetX rates, the 2 doses of enoxaparin were not cost-effective because their final break-even rate exceeded the initial VTE rate.

Conclusion: Aspirin and, in some cases, enoxaparin are cost-effective treatments for VTE prophylaxis after knee arthroscopy.

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