4Arthroscopy | JSES KSSTA Arthroscopy 4B journals

Issue 83.3, Arthroscopy, July 2021

Website www.4b.4abstracts.nl

Part of www.4abstracts.com

4B Arthroscopy founders: D.P. ter Meulen, B. Lubberts

Contact 4@erasmusmc.nl

Manual The titles in the contents are hyperlinks. Use these hyperlinks and the back button underneath every abstract to navigate more easily through the document. All abstracts have a hyperlink to the website of the article. Use this hyperlink to view the article in full-text. Articles can only be accessed in full-text through a personal account or the account of an institution.

Content
July 2021

Upper extremity

Arthroscopy
Volume 37, issue 7

- Bankart Repair With Subscapularis Augmentation in Athletes With Shoulder Hyperlaxity
- Arthroscopic Autologous Scapular Spine Bone Graft Combined With Bankart Repair for Anterior Shoulder Instability With Subcritical (10%-15%) Glenoid Bone Loss
- Greater Tuberosity Bone Mineral Density and Rotator Cuff Tear Size Are Independent Factors Associated With Cutting-Through in Arthroscopic Suture-Bridge Rotator Cuff Repair
- Needle Diagnostic Arthroscopy and Magnetic Resonance Imaging of the Shoulder Have Comparable Accuracy With Surgical Arthroscopy: A Prospective Clinical Trial
- Efficacy of Arthroscopic Surgery in the Management of Adhesive Capsulitis: A Systematic Review and Network Meta-analysis of Randomized Controlled Trials

Journal of Shoulder and Elbow Surgery (JSES)
Volume 30, issue 7

- Prospective, randomized evaluation of latissimus dorsi transfer and superior capsular reconstruction in massive, irreparable rotator cuff tears.
- Factors associated with the development of early- to mid-term cuff-tear arthropathy following arthroscopic rotator cuff repair.
- Level of obesity is directly associated with complications following arthroscopic rotator cuff repair.
- The impact of prior ipsilateral arthroscopy on infection rates after shoulder arthroplasty.
- Short-term complications of the Latarjet procedure: a systematic review.
- Opioid requirement after rotator cuff repair is low with a multimodal approach to pain.
- Inconsistencies in the MRI Evaluation of Rotator Cuff Atrophy After Surgical Repair.
- Arthroscopic Guided Latarjet and Arthroscopic Guider Autologous Iliac Crest Bone Graft or Xenograft Combined with Subscapularis Augmentation Using Round-Button in Recurrent Anterior Shoulder Instability: A Prospective Study.
- Associations of Hypo-High-Density Lipoproteinemia with Increments of Preoperative Rotator Cuff Tear Size and with Postoperative Retear.
- Evaluation of Three Different Rehabilitation Protocols After Rotator Cuff Repair, and the Effectiveness of Water/Pool Therapy. A Randomized Control Study.
- Surgery and Physiotherapy Were Both Successful in the Treatment of Small, Acute, Traumatic Rotator Cuff Tears: A Prospective Randomized Trial.
- The Biomechanical Effect of Bone Grafting and Bone Graft Remodeling in Shoulder Instability Patients.
- Simplified Technique of Arthroscopic Subscapularis Split During Dynamic Anterior Stabilization (DAS).
- Arthroscopic Reduction and Transosseous Suture Fixation of Avulsed Displaced Greater Tuberosity Fracture.
- Arthroscopic Stabilisation of Atraumatic Shoulder Instability: Minimum Two Year Outcomes.
- Outcomes of Arthroscopic Latarjet As a Revision Procedure for Treatment of Recurrent Anterior Shoulder Instability After Failed Arthroscopic Bankart Repair. A Case Series.

BACK

- Recurrent Instability in Patients with a Rotator Cuff Repair After a Traumatic Shoulder Dislocation.
- Dermal Patch Augmented Versus Standard Rotator Cuff Repair: Randomised Controlled Trial.
- Treatment of Massive Irreparable Rotator Cuff Tears: Preliminary Comparative Study of the Surgical Outcome.
- The “purse string” technique for anterior glenohumeral instability: long term results.
- The Effects of Rotator Cuff Tear on Shoulder Proprioception.
- Infection in Revision Instability Surgery? Results of a Prospective Multicenter Consecutive Cohort Study.
- Long Term Outcomes After Arthroscopic Transosseous Equivalent Repair: Clinical and MRI Results of Medium to Large Rotator Cuff Tears At a Minimum Follow-Up of 10 Years.
- Arthroscopic Knotless Separate Layer Transosseous Equivalent Repair of Delaminated Rotator Cuff Tears.
- Ultrasound Assisted Intralesional Methylene Blue Injection for the Arthroscopic Decompression of Spinoglenoid Notch Cyst Causing Suprascapular Neuropathy.
- Microbiological Analysis of Post-Operative Shoulder Infection: Retrospective Multicenter Study Over a Seven-Year Period in Trauma, Arthroplasty and Arthroscopy.
- Long-Term Results of Arthroscopic Reduction and Fixation of Anterior Glenoid Rim Fractures.
- Do Champagne Toast and Champagne Pour Clinical Tests Correlate with Location and Size of Rotator Cuff Tears?
- Adjustable Button and All-Suture Anchors As Suspensory Devices for Arthroscopic Glenoid Rim Fracture Fixation. Surgical Technique and Preliminary Results.
- The Role of Arthroscopic Glenoidplasty and Osteocapsular Arthroplasty in the Treatment of Advanced Glenohumeral Arthritis.
- Dynamic Anterior Stabilization (DAS) with the Long Head of the Biceps. Preliminary Results.
- Arthroscopic Eden-Hybbinette for Revision of Failed Latarjet.
- Analysis of Patients That Did Not Return to Play Following Arthroscopic Bankart Repair.
- Comparison of Repair Integrity and Functional Outcomes Between Knot-Tying and Knotless Suture-Bridge Arthroscopic Rotator Cuff Repair: A Prospective Randomized Clinical Trial.
- Arthroscopic Treatment of Isolated Coronoid Fracture: Results on 47 Patients with 2 Years Minimum Follow-Up.
- Arthroscopic Rotator Cuff Repair: Is Healing Enough?
- Preoperative Systemic Administration of Acid Tranexamic to Reduce Intraoperative Bleeding in Arthroscopic Rotator Cuff Repair.
- High Return to Sport After Arthroscopic Latarjet for Failed Arthroscopic Bankart.
- Arthroscopic Surgery of Rotator Cuff Retear: New Repair Versus Tendon Transfer.
- Return to Play After Arthroscopic Repair of Combined Bankart and Type V Superior Labral Anterior-Posterior Tears.
- Muscles Strength and Functional Recovery: Prospective Comparaison Between Arthroscopic and Open Latarget Procedures

Knee Surgery, Sports Traumatology, Arthroscopy (KSSTA)
Volume 29, Issue 7

BACK

- The prevalence of intraarticular associated lesions after acute acromioclavicular joint injuries is 20%. A systematic review and meta-analysis.
- The Kite technique: a new all-arthroscopic technique for the treatment of acute acromioclavicular joint dislocation.
- All arthroscopic coracoclavicular button fixation is efficient for Neer type II distal clavicle fractures.
- Shoulder outcome scoring systems have substantial ceiling effects 2 years after arthroscopic rotator cuff repair.
- Comparable clinical outcomes using knotless and knot-tying anchors for arthroscopic capsulolabral repair in recurrent anterior glenohumeral instability at mean 5-year follow-up.
- Acromioclavicular joint arthritis is not an indication for routine distal clavicle excision in arthroscopic rotator cuff repair.
- Primary arthroscopic repair of massive rotator cuff tears results in significant improvements with low rate of re-tear.
- Arthroscopic Bankart repair with all-suture anchors does not cause important glenoid bone osteolysis: a volumetric CT study of 143 anchors.
- Biologic and synthetic ligament reconstructions achieve better functional scores compared to osteosynthesis in the treatment of acute acromioclavicular joint dislocation.
- No differences between conservative and surgical management of acromioclavicular joint osteoarthritis: a scoping review.
- Patients who have undergone rotator cuff repair experience around 75% functional recovery at 6 months after surgery.
- Increased levels of inflammatory markers in the subscapularis tendon and joint capsule in patients with subacromial impingement.
- Anatomic reconstruction of the acromioclavicular joint provides the best functional outcomes in the treatment of chronic instability.
- Footprint preparation with nanofractures in a supraspinatus repair cuts in half the retear rate at 1-year follow-up. A randomized controlled trial.
- Prediction of the anterior shoulder pain source by detecting indirect signs for partial articular subscapularis tendon tears through conventional magnetic resonance imaging.
- Arthroscopic knotless repair: an effective technique for small-sized supraspinatus tendon tears.
- Treatment type may influence degree of post-dislocation shoulder osteoarthritis: a systematic review and meta-analysis.
- No difference in 90-day complication rate following open versus arthroscopic Latarjet procedure.
- Arthroscopic remplissage with all-suture anchors causes cystic lesions in the humerus: a volumetric CT study of 55 anchors.
- Arthroscopic reduction and subscapularis remplissage (ARR) of chronic posterior locked shoulder dislocation leads to optimized outcomes and low rate of complications.
- Repair of high-grade partial thickness supraspinatus tears after surgical completion of the tear have a lower retear rate when compared to full-thickness tear repair.

American Journal of Sports Medicine (AJSM)
Volume 49, Issue 7

BACK

- The Effect of Platelet-Rich Plasma Leukocyte Concentration on Arthroscopic Rotator Cuff Repair: A Network Meta-analysis of Randomized Controlled Trials
- Outcomes of Arthroscopic Nerve Release in Patients Treated for Large or Massive Rotator Cuff Tears and Associated Suprascapular Neuropathy: A Prospective, Randomized, Double-Blinded Clinical Trial

Clinical Orthopaedics and Related Research
Volume 479, Issue 7

- Does Biceps Tenotomy or Tenodesis Have Better Results After Surgery? A Systematic Review and Meta-analysis

Lower extremity

Arthroscopy
Volume 37, issue 7

- Concomitant Lumbar Spinal Stenosis Negatively Affects Outcomes After Hip Arthroscopy for Femoroacetabular Impingement
- Tenotomy for Iliopsoas Pathology is Infrequently Performed and Associated with Poorer Outcomes in Hips Undergoing Arthroscopy for Femoroacetabular Impingement
- Joint Venting Prior to Hip Distraction Minimizes Traction Forces During Hip Arthroscopy
- Multimodal Nonopioid Pain Protocol Provides Equivalent Pain Versus Opioid Control Following Meniscus Surgery: A Prospective Randomized Controlled Trial
- Use of Extracellular Matrix Cartilage Allograft May Improve Infill of the Defects in Bone Marrow Stimulation for Osteochondral Lesions of the Talus
- Return-to-Sport Rate and Activity Level Are High Following Arthroscopic All-Inside Meniscal Repair With and Without Concomitant Anterior Cruciate Ligament Reconstruction: A Systematic Review
- Bone Grafting the Patellar Defect After Bone–Patellar Tendon–Bone Anterior Cruciate Ligament Reconstruction Decreases Anterior Knee Morbidity: A Systematic Review

American Journal of Sports Medicine (AJSM)
Volume 49, Issue 7

- Increased Posterior Tibial Slope Is Associated With Greater Risk of Graft Roof Impingement After Anatomic Anterior Cruciate Ligament Reconstruction
- Timing of Anterior Cruciate Ligament Reconstruction and Relationship With Meniscal Tears: A Systematic Review and Meta-analysis
- Training Surgeons to Perform Arthroscopic All-Inside Meniscal Repair: A Randomized Controlled Trial Evaluating the Effectiveness of a Novel Cognitive Task Analysis Teaching Tool, Imperial College London/University College London Meniscus Repair Cognitive Task Analysis (IUMeRCTA)
- Achieving Successful Outcomes in High-Level Athletes With Borderline Hip Dysplasia Undergoing Hip Arthroscopy With Capsular Plication and Labral Preservation: A Propensity-Matched Controlled Study
- Defining Clinically Significant Improvement on the Patient-Reported Outcomes Measurement Information System Test at 1-Year Follow-up for Patients Undergoing Hip Arthroscopy for the Treatment of Femoroacetabular Impingement Syndrome
- Association Between Orientation and Magnitude of Femoral Torsion and Propensity for Clinically Meaningful Improvement After Hip Arthroscopy for Femoroacetabular Impingement Syndrome: A Computed Tomography Analysis

BACK

- Image-Guided Intra-articular Hip Injections and Risk of Infection After Hip Arthroscopy

Miscellaneous

-

BACK

Upper extremity

Arthroscopy, Volume 37, Issue 7

Bankart Repair With Subscapularis Augmentation in Athletes With Shoulder Hyperlaxity

Marco Maiotti, Raffaele Russo, Antonio Zanini, Roberto Castricini, Gianluca Castellarin, Steffen Schröter, Carlo Massoni, Felix Henry Savoie

https://doi.org/10.1016/j.arthro.2021.01.062

Purpose
The purpose of this study was to demonstrate that arthroscopic Bankart repair with associated arthroscopic subscapularis augmentation (ASA) could be a valid surgical option in the treatment of anterior shoulder instability, in collision and contact sports athletes, affected by shoulder hyperlaxity.

Methods
In total, 591 arthroscopic Bankart repairs plus ASA were performed in 6 shoulder centers from 2009 to 2017. Inclusion criteria were the following: collision and contact sports activities, recurrent anterior instability associated with hyperlaxity and glenoid bone loss (GBL) < 15%. Exclusion criteria were GBL > 15%, voluntary instability, multidirectional instability, pre-existing osteoarthritis and throwing athletes. The minimum follow-up was 24 months. Hyperlaxity was clinically evaluated according to Neer and Coudane-Walch tests. Before surgery, all patients underwent magnetic resonance imaging and computed tomography scanning. Pico area method was used to assess the percentage of GBL. Patients were operated on by 6 surgeons, and their functional outcomes were evaluated by 2 independent observers. The Western Ontario Shoulder Instability Index (WOSI), Rowe, American Shoulder and Elbow Surgeons (ASES) scores were used to assess results.

Results
Overall, 397 patients with evidence of shoulder hyperlaxity (positive sulcus sign in ER1 position and Coudane-Walch test > 85°) met all inclusion criteria. The mean WOSI score was 321; the mean Rowe score rose from 68.5 to 92.5 (P = .037), and the ASES score rose from 71.5 to 97.4 (P = .041). Seven patients (1.6%) had atraumatic redislocation, and 9 patients (2.2%) had post-traumatic redislocation. At final follow-up the mean functional deficit of external rotation was 15° with the arm in adduction (ER1 position) and 10° in abduction (ER2 position).

Conclusions
The Bankart repair plus ASA has been demonstrated to be safe and effective for restoring joint stability in patients practicing collision and contact sports or affected by chronic anterior shoulder instability associated with GBL (<15%) and hyperlaxity, without compromising external rotation.

Level of Evidence
Level IV, case series.

BACK

Arthroscopic Autologous Scapular Spine Bone Graft Combined With Bankart Repair for Anterior Shoulder Instability With Subcritical (10%-15%) Glenoid Bone Loss

Ming Xiang, Jinsong Yang, Hang Chen, Xiaochuan Hu, Qing Zhang, Yiping Li, Chunyan Jiang

https://doi.org/10.1016/j.arthro.2021.01.061

Purpose
The purpose of our study is to prove that the autologous scapular spine bone graft is an alternative for the treatment of anterior shoulder instability and the clinical and radiological results are promising.

Method
From July 2016 to August 2018, patients who were diagnosed as having anterior shoulder instability with subcritical (10%-15%) glenoid bone loss were treated by arthroscopic repair with autologous scapular spine bone graft. The inclusion criteria were (1) anterior shoulder instability underwent arthroscopic autologous scapular spine bone graft; (2) glenoid bone loss was within 10% to 15% (measured by Sugaya's method); (3) three complete sets of computed tomography (CT) scans (preoperative, 1 week after surgery, and 1 year after surgery) available; and (4) clinical follow-up time was at least 2 years. The exclusion criteria were (1) concomitant rotator cuff tear; (2) concomitant remplissage or SLAP repair; (3) previous surgery of the affected shoulder; (4) open surgery; and (5) incomplete radiological or clinical follow-up. The preoperative and postoperative Constant-Murley score, dietary approaches to stop hypertension (DASH) score, visual analog scale (VAS) score, and range of motion (ROM) were recorded. CT scans with 3-dimensional reconstruction were obtained at the first week after operation and at 1 year after operation; the graft resorption rate was consequently calculated.

Results
Twenty-seven patients were qualified and enrolled in the study. No severe complication was recorded during follow-up. No redislocation or subluxation was found, and the apprehension tests were all negative. At the last follow-up, the mean Constant-Murley score was 89.74 ± 3.71, the mean DASH score was 9.77 ± 5.31, the mean VAS score was 0.74 ± 0.64, which are all improved significantly compared with preoperative scores (P = .00,.00,.00, respectively). At the last follow-up, the ROM including anterior flexion, external rotation by side, and the internal rotation were well restored without significant difference compared with the contralateral shoulder (P =.48, .08, .47, respectively). At 1 year after operation, the resorption rate of the bone graft was 19.4%.

Conclusion
This study found that anterior shoulder instability with subcritical (10%-15%) glenoid bone loss treated with arthroscopic autologous scapular spine bone graft with suture anchor fixation is safe and could achieve satisfactory result at short-term follow-up.

Level of Evidence
Therapeutic case series.

BACK

Greater Tuberosity Bone Mineral Density and Rotator Cuff Tear Size Are Independent Factors Associated With Cutting-Through in Arthroscopic Suture-Bridge Rotator Cuff Repair

Lee S, Hwang JT, Lee SS, Lee JH, Kim TY

https://doi.org/10.1016/j.arthro.2021.01.059

Purpose
To evaluate the correlation between cutting-through at the greater tuberosity (GT) in arthroscopic suture-bridge rotator cuff repair and the bone mineral density (BMD) of the lumbar spine, hip, and ipsilateral GT of the proximal humerus and to evaluate factors and clinical outcomes related to cutting-through.

Methods
This study prospectively enrolled patients who underwent arthroscopic knotted suture-bridge rotator cuff repair for full-thickness rotator cuff tears between June 2014 and October 2015 and who had undergone dual-energy X-ray absorptiometry cans within 1 month before surgery with a minimum 2-year follow-up. Cutting-through was defined as the occurrence of cortical breakage of the GT just medial to the lateral knotless anchor hole due to the tension of the sutures from the medial anchor, and it was assessed. Clinical and radiologic data were analyzed. Univariate and regression analyses were performed to evaluate factors related to cutting-through.

Results
A total of 78 patients were analyzed. Patients were divided into 2 groups: patients who had cutting-through (46, group I) and patients who did not (32, group II). In an analysis of lumbar spine, hip, and GT BMD, GT BMD was the most effective for predicting cutting-through (area under the receiver operating characteristic curve = 0.94, 95% confidence interval 0.89-0.99). GT BMD ($P < .001$) and tear size ($P = .004$) were independent factors for cutting-through. Although a significant difference was found between the 2 groups in terms of age, sex, lumbar spine and hip BMD, fatty infiltration of the supraspinatus and infraspinatus, and atrophy of the supraspinatus, these variables were not independent factors. Clinical and structural outcomes showed no significant difference between the 2 groups, and anchor failure was not identified intraoperatively.

Conclusions
GT BMD and rotator cuff tear size are independent factors associated with cutting-through at the GT. A dual-energy X-ray absorptiometry scan of the proximal humerus is useful for predicting bone quality before arthroscopic suture-bridge rotator cuff repair.

Level of Evidence
Level II, Prospective cohort study.

BACK

Needle Diagnostic Arthroscopy and Magnetic Resonance Imaging of the Shoulder Have Comparable Accuracy With Surgical Arthroscopy: A Prospective Clinical Trial

Eric R. Wagner, Jarret M. Woodmass, Zachary R. Zimmer, Kathryn M. Welp, Michelle J. Chang, Alexander M. Prete, Kevin X. Farley, Jon J.P. Warner

https://doi.org/10.1016/j.arthro.2021.03.006

Purpose
To examine the accuracy, sensitivity, and specificity of a minimally invasive needle arthroscopy device and magnetic resonance imaging (MRI) compared with diagnostic arthroscopy, the gold standard in diagnosing intra-articular shoulder pathologies.

Methods
This was a prospective, blinded clinical trial over 6 months on 50 patients with shoulder pathology requiring arthroscopy. Patients were eligible if they had an MRI and consented for surgical arthroscopy. Patients were excluded if they didn't consent. Each underwent a clinical evaluation, MRI, needle arthroscopy, and surgical arthroscopy. Videos and images were blindly reviewed postoperatively. Analysis included sensitivity, specificity, positive predictive value (PPV), negative predictive value, Cohen's kappa agreement coefficient, and the McNemar test.

Results
Needle arthroscopy had similar accuracy to MRI in diagnosing intra-articular shoulder pathologies when both were compared with the gold standard of diagnostic arthroscopy. It had high specificities and PPV for certain rotator cuff tears, biceps pathology, and anterior labral tears. When compared with the gold standard, specificity of needle arthroscopy for diagnosing rotator cuff tear and cartilage lesions was 1.00 and 0.97 and 0.72 and 0.86 for MRIs, respectively. Sensitivity of needle arthroscopy for rotator cuff and cartilage lesions was 0.89 and 0.74, respectively, lower than MRI. For most intra-articular pathologies, needle arthroscopy was at least equally accurate to MRI at diagnosing intra-articular shoulder pathologies, with similar or high kappa statistics when correlated with surgical arthroscopic findings.

Conclusions
Needle arthroscopy is a promising diagnostic modality for intra-articular shoulder pathologies. It had comparable accuracy with MRI for diagnosing articular cartilage, labrum, rotator cuff, and biceps pathology. Across all pathologies, needle arthroscopy had better ability to "rule in" a diagnosis (high specificities and PPV), but slightly worse ability to "rule out" a diagnosis (lower sensitivities and negative predictive value) compared with MRI.

Level of Evidence
Level II, Development of diagnostic criteria on consecutive patients (with universally applied reference "gold" standard).

BACK

Efficacy of Arthroscopic Surgery in the Management of Adhesive Capsulitis: A Systematic Review and Network Meta-analysis of Randomized Controlled Trials

Forsythe, Brian & Lavoie-Gagne, Ophelie & Patel, Bhavik & Lu, Yining & Ritz, Ethan & Chahla, Jorge & Okoroha, Kelechi & Allen, Answorth & Nwachukwu, Benedict.

https://doi.org/10.1016/j.arthro.2020.09.041

Purpose
To determine which interventions optimize clinical outcomes in adhesive capsulitis by performing a network meta-analysis of randomized controlled trials.

Methods
A systematic review was conducted of all clinical trials on adhesive capsulitis published since 2008. Patient cohorts were grouped into treatment categories; data collected included range of motion (ROM) and patient-reported outcome measures (PROMs). Interventions were compared across groups by means of arm-based Bayesian network meta-analysis in a random-effects model.

Results
Sixty-six studies comprising 4042 shoulders (57.6% female patients, age 54.8 ± 3.2 years [mean ± standard deviation]) were included. The most commonly studied interventions were physical therapy (PT) or shoulder injections. Network meta-analysis demonstrated that arthroscopic surgical capsular release was the most effective treatment in increasing ROM. This effect was apparent in forward flexion (effect difference [ED] versus placebo, 44°, 95% confidence interval [CI] 31° to 58°), abduction (ED 58°, 45° to 71°), internal rotation (ED 34°, 24° to 44°), and external rotation (ED 59°, 37° to 80°). Interventions most effective for pain relief included PT supplemented with either medical therapy (ED –4.50, –9.80 to 2.80) or ultrasound therapy (ED –5.10, –5.10 to –1.40). Interventions most effective for improvement of functional status included PT, manipulation under anesthesia (MUA), intra-articular or subacromial steroid injection, surgical capsular release, and supplementation of PT with alternative therapy.

Conclusions
No one treatment emerged superior in regard to ROM, pain symptoms, and functional status. Surgery (after failure of conservative treatment) ranked highest across all ROM domains. Treatments that ranked highest for treatment of pain included PT supplemented with either medical therapy or ultrasound. Finally, treatments that ranked highest for improvements in functional status included MUA, PT with medical therapy, surgical intervention, PT with ultrasound, PT with injection, and injection alone.

Level of Evidence
II, systematic review and network meta-analysis of level I and II studies

BACK

Journal of Shoulder and Elbow Surgery (JSES), Volume 30, issue 7

Prospective, randomized evaluation of latissimus dorsi transfer and superior capsular reconstruction in massive, irreparable rotator cuff tears.

Ozturk, B.Y., Ak, S., Gultekin, O., et al.

DOI: https://doi.org/10.1016/j.jse.2021.01.036

Background
The treatment of massive, irreparable rotator cuff tears remains controversial today because there is no consensus on the ideal treatment option. This investigation aimed to prospectively evaluate and compare the outcomes of arthroscopy-assisted latissimus dorsi transfer and superior capsular reconstruction in the treatment of massive, irreparable rotator cuff tears.

Methods
Forty-two patients at an average age of 62.8 years with massive, irreparable rotator cuff tears were randomized into 2 treatment groups. Twenty-one patients underwent arthroscopy-assisted latissimus dorsi tendon transfer (LDT), and 21 patients underwent arthroscopy-assisted superior capsular reconstruction (SCR). The patients were followed up prospectively for 31 months on average. One patient in the SCR group was lost to follow-up. The outcomes were evaluated with American Shoulder and Elbow Surgeons Standardized Shoulder Assessment Form (ASES), Western Ontario Rotator Cuff Index (WORC), visual analog scale (VAS), and Constant scores clinically and with acromiohumeral distance (AHD) measurements radiologically.

Results
Both groups displayed improved results in ASES, WORC, Constant, and VAS scores in the final follow-up ($P < .001$). The LDT group had significantly better results in AHD ($P = .006$), whereas the SCR group yielded significantly higher improvements in ASES ($P = .007$) and Constant ($P = .008$) scores. The rate of successful pseudoparalysis treatment was 45% (5/11) in the LDT group and 92% (12/13) in the SCR group ($P = .011$). The graft failure rate was 5% (1 patient) in each group postoperatively; 1 patient in the SCR group had a traumatic graft rupture and 1 patient in the LDT group was complicated with septic arthritis, which required graft removal.

Conclusion
Both SCR and LDT yielded promising short-term results in treatment of massive, irreparable rotator cuff tears in this study. The SCR group displayed better overall outcomes clinically, particularly in the pseudoparalytic shoulders, whereas the LDT group displayed better radiologic results.

Level of evidence
Level II, Randomized Controlled Trial

BACK

Factors associated with the development of early- to mid-term cuff-tear arthropathy following arthroscopic rotator cuff repair.

Misir, A., Uzun, E., Kizkapan, T.B., et al.

DOI: https://doi.org/10.1016/j.jse.2020.09.016

Background
Few studies have specifically evaluated the development of cuff-tear arthropathy (CTA) after a rotator cuff repair in the postoperative early to mid-term. This study aimed to identify the factors associated with the development of CTA, to evaluate the effect of arthropathy on functional outcomes, and to evaluate the incidence of CTA 3-10 years after an arthroscopic rotator cuff repair.

Methods
A total of 312 patients who underwent an arthroscopic repair of a large or massive full-thickness rotator cuff tear with a minimum follow-up of 3 years were retrospectively divided into 2 groups for analysis: those with postrepair CTA (arthritic glenohumeral changes due to rotator cuff insufficiency) and those without. CTA was assessed using the Seebauer and modified Hamada-Fukuda classification systems. Pre-, intra-, and postoperative patient characteristics; characteristics of the rotator cuff tear; clinical and radiological parameters; and pre- and postoperative functional scores were compared.

Results
The rate of development of CTA was 11.5% (36 of 312 patients, 13 centric and 23 eccentric arthropathy). CTA was more frequently associated with the poor integrity of the supraspinatus tendon after repair ($P < .001$) and massive tears ($P = .006$). Postoperative pseudoparalysis ($P < .001$), symptomatic retear ($P < .001$), tear size ($P = .026$), critical shoulder angle ($P = .001$), preoperative acromiohumeral interval ($P = .046$), and the humeral head superior migration ($P = .001$) were found to be associated with the development of CTA. However, only postoperative pseudoparalysis was found to be an independent risk factor ($P < .001$, odds ratio: 2.965). Patients with postrepair CTA had significantly worse functional outcome scores.

Conclusion
The postoperative development of pseudoparalysis may be a marker of CTA in the future and that closer follow-up may be necessary.

Level of evidence
Level III, Retrospective Case-Control Study

BACK

Level of obesity is directly associated with complications following arthroscopic rotator cuff repair.

Kashanchi, K.I., Nazemi, A.K., Komatsu, D.E.,

DOI: https://doi.org/10.1016/j.jse.2020.09.029

Background
The purpose of this study was to investigate the association between increasing levels of obesity and postoperative complications within 30 days of arthroscopic rotator cuff repair (ARCR).

Methods
We queried the American College of Surgeons National Surgical Quality Improvement Program database for all patients who underwent ARCR from 2015 to 2017. Patients were stratified into 3 cohorts according to their body mass index (BMI). Patients with a BMI < 30 kg/m2 were placed in the non-obese cohort, patients with a BMI between 30 and 40 kg/m2 were placed in the obese cohort, and patients with a BMI > 40 kg/m2 were placed in the morbidly obese cohort. Postoperative complications within 30 days of the procedure were collected. Multivariate logistic regression was used to investigate the relationship between increasing levels of obesity and postoperative complications.

Results
There were 18,521 patients included in this study. Of these patients, 9548 (51.6%) were non-obese, 7438 (40.2%) were obese, and 1535 (8.3%) were morbidly obese. A comparison among non-obese, obese, and morbidly obese patients showed increasing rates of medical complications (0.5% vs. 1.0% vs. 1.4%), pulmonary complications (0.1% vs. 0.3% vs. 0.5%), renal complications (0.0% vs. 0.1% vs. 0.2%), readmission (0.9% vs. 1.2% vs. 1.6%), nonhome discharge (0.4% vs. 0.5% vs. 1.2%), and overall complications (0.8% vs. 1.3% vs. 1.8%). In comparison to non-obesity, both obesity and morbid obesity were identified by multivariate analysis as significant predictors of medical complications (odds ratio [ORs] of 1.72 and 2.16, respectively), pulmonary complications (ORs of 2.66 and 4.06, respectively), and overall complications (ORs of 1.52 and 1.77, respectively).

Conclusion
This study used a large national database to identify increasing levels of obesity as a risk factor for medical complications, pulmonary complications, and overall complications within 30 days of ARCR.

Level of evidence
Level III, Retrospective Case-Control Design

BACK

The impact of prior ipsilateral arthroscopy on infection rates after shoulder arthroplasty.

Wright-Chisem, J., Apostolakos, J.M., Dines, J.S., et al.

DOI: https://doi.org/10.1016/j.jse.2020.09.019

Background
Patients frequently undergo interventions before shoulder arthroplasty, including injections and arthroscopy. Although the potential impact of injections on postoperative outcomes such as infection has been well studied, it is less clear whether prior arthroscopy has an impact on infection rates after shoulder arthroplasty. The purpose of this study was to determine whether prior ipsilateral shoulder arthroscopy is associated with an increased risk of postoperative infection after shoulder arthroplasty.

Methods
Patients who underwent shoulder arthroplasty, including hemiarthroplasty, total shoulder arthroplasty, or reverse shoulder arthroplasty with a minimum of 1-year preoperative database exposure, were queried using Current Procedural Terminology codes from 2 large insurance databases, including both private-payer (Humana, 2008-2017) and Medicare (2006-2014) data. Patients with procedures for infection, fractures, or without laterality data were excluded. Those who underwent ipsilateral shoulder arthroscopy within 2 years before their arthroplasty were identified and compared with controls who did not undergo prior arthroscopy. Each database was analyzed separately. Periprosthetic infection within 1 year after arthroplasty was queried for each group and compared using a logistic regression analysis with control for demographic and comorbidity confounders.

Results
A total of 9362 Medicare patients and 17,716 private-payer patients were included in the study. Of these, 486 (5.2%) Medicare patients and 685 (3.9%) private-payer patients underwent prior arthroscopy. In the Medicare database, prior arthroscopy was also associated with a postarthroplasty infection rate of 3.9% as compared with 1.9% in the control group (odds ratio: 1.96, 95% confidence interval: 1.20-3.22, P = .003). Similarly, in the private insurance cohort, prior shoulder arthroscopy was associated with a postarthroplasty infection rate of 2.9% as compared with 1.4% in the control group (odds ratio: 1.85, 95% confidence interval: 1.13-3.03, P = .005).

Conclusion
Shoulder arthroscopy performed within 2 years before shoulder arthroplasty is associated with a higher infection rate in the first year after shoulder arthroplasty.

Level of evidence
Level III

BACK

Short-term complications of the Latarjet procedure: a systematic review.

Hurley, E.T., Schwartz, L.B., Mojica E.S., et al.

DOI: https://doi.org/10.1016/j.jse.2021.01.024

Purpose
The purpose of this study is to evaluate the short-term complication rate following the open and arthroscopic Latarjet procedures and to meta-analyze the studies comparing the 2 approaches.

Methods
PubMed was searched according to Preferred Reporting Items for Systematic reviews and Meta-Analyses (PRISMA) guidelines to find clinical and biomechanical studies comparing complication rates in open and arthroscopic Latarjet procedures. A literature search of MEDLINE, Embase, and the Cochrane Library was performed based on the PRISMA guidelines. Clinical studies reporting on the complications following the open or arthroscopic Latarjet were included. Meta-analysis was performed for comparative studies using Review Manager, version 5.3. A P value of <.05 was considered statistically significant.

Results
Overall, 89 studies (Level of Evidence [LOE] I: 2, LOE II: 2, LOE III: 24, LOE IV: 61) met inclusion criteria, with 7175 shoulders. Following the open Latarjet procedure, the overall complication rate was 6.1%, with a 1.9% occurrence of graft-related complications, 1.1% hardware, 1.1% wound, 0.9% nerve, and 1.2% other complications. Following the arthroscopic Latarjet procedure, the overall complication rate was 6.8%, with a 3.2% occurrence of graft-related complications, 1.9% hardware, 0.5% wound, 0.7% nerve, and 0.5% other complications. Complications were reported in 7 studies comparing 379 patients treated with the open Latarjet and 531 treated with the arthroscopic Latarjet, with no statistically significant difference between the two (P = .81).

Conclusion
Our study established that the overall complication rate following the Latarjet procedure was 6%-7%, with the most common complication being graft-related. Furthermore, based on the current evidence, there is no significant difference in the complication rate between the open and arthroscopic Latarjet procedures.

Level of Evidence
Level IV, Systematic Review

BACK

Opioid requirement after rotator cuff repair is low with a multimodal approach to pain.

Mandava, N.K., Sethi, P.M., Routman, HD., et al.

DOI: https://doi.org/10.1016/j.jse.2020.09.032

Background
Current practices may aim to blunt rather than understand postoperative pain. Perhaps the most common serious complication of arthroscopic rotator cuff repair (ARCR) is persistence of opiate medication intake. Patients still receive upwards of 80 oxycodone 5 mg pills, or 600 morphine milligram equivalents (MMEs), leading more than 20% of opioid-naïve subjects to continue to fill opioid prescriptions beyond 180 days after surgery. Developing evidence-based guidelines for narcotic prescription after ARCR presents an opportunity for orthopedic surgeons to address the opioid epidemic.

Purpose
The purpose of this study was (1) to prospectively determine the requirements for opiate medications after ARCR, and (2) to create an evidence-based guideline for postoperative prescription, in contrast to the anecdotal or expert panel recommendations that currently exist. We further investigated whether a liposomal bupivacaine (LB) interscalene never block (ISNB) would reduce pain and opiate consumption compared with standard bupivacaine ISNB (control) for ARCR.

Methods
The study enrolled 100 patients who underwent primary ARCR surgery. Patients were provided with postoperative “pain journals” to document their daily pain on a numerical rating scale, satisfaction with pain management using the Likert scale, and track their daily oxycodone 5 mg pill consumption during the 14-day postoperative period. Enrolled patients were further randomized to receiving an LB (experimental) or standard bupivacaine (control) ISNB.

Results
A total of 77% of all patients required fewer than 15 pills postoperatively. The LB group consumed an average of 1.7 fewer pills (13.0 MMEs) on postoperative day (POD) 1 (P = .02) and reported statistically lower pain during PODs 1 and 2 (P = .01 and P = .006), as well as cumulatively throughout the study period (P = .03). In addition, LB patients remained opioid-free at a higher rate (44% vs. 15% in controls, P = .03).

Conclusion
With a multimodal approach, the majority of patients undergoing ARCR can manage postoperative pain with 15 or fewer oxycodone 5 mg tablets (112.5 MMEs) and maintain a high degree of satisfaction. The addition of an LB ISNB may further reduce the consumption of postoperative narcotics compared with a standard ISNB. This study provides evidence that may be used for surgeon guidelines in the effort to reduce opioid prescriptions after ARCR.

Level of evidence
Level II, Randomized Controlled Trial

BACK

Inconsistencies in the MRI Evaluation of Rotator Cuff Atrophy After Surgical Repair.

Jang, Y.H., Kim, S.H.

DOI: https://doi.org/10.1016/j.jse.2021.03.004

Aim
How do discrepancies between scanning axes in conventional Y-view in magnetic resonance image (MRI) cause errors when evaluating changes rotator cuff atrophy after surgical repair? Is there a more medial section than conventional Y-view that is not influenced as much by tendon retraction recovery?

Background
The atrophy of the rotator cuff muscles is one of the most important prognostic factors following surgical repair. Its reversibility after repair is controversial. The cross-sectional area of the supraspinatus is measured in conventional Y-view in MRI to evaluate the reversibility of atrophy after repair. Sections more medial than conventional Y-view are known to be less affected by recovery of tendon retraction.

Methods
Thirty-six patients with a full-thickness supraspinatus tear and retraction that underwent arthroscopic complete repair with preoperative and immediate postoperative MRIs were studied. Angles between conventional Y-view planes in preoperative and immediate postoperative MRIs were measured. MRIs were reconstructed perpendicular to scapular axes by multi-planar reconstruction. Differences between the cross-sectional areas of the supraspinatus in pre- and immediate postoperative Y-view in original and reconstructed MRIs were compared, and changes of cross-sectional areas of the supraspinatus after repair in two sections medial to reconstructed Y-view were compared.

Results
The mean angle between conventional Y-view planes in pre- and immediate postoperative MRIs was 13.1° ± 7.1°. The mean pre- to postoperative increase in the cross-sectional area of the supraspinatus in conventional Y-view was greater than that measured in reconstructed Y-view (95 ± 72 mm2 vs. 75 ± 62 mm2, p =0.024). Furthermore, pre- to postoperative cross-sectional area differences in the two medial sections were less than in reconstructed Y-view. For the most medial section, crossing the omohyoid origin, cross-sectional area differences were not significant (434 ± 98 mm2 vs. 448 ± 98 mm2, p=0.061).

Conclusions
Scanning axes inconsistencies in conventional Y-view cause unacceptable errors in measuring the cross-sectional area of the supraspinatus after repair. We recommend reconstruction along a consistent axis by multi-planar reconstruction when evaluating postoperative changes in supraspinatus atrophy, and that the use of sections more medial than scapular Y-view can reduce errors caused by tendon retraction.

BACK

Arthroscopic Guided Latarjet and Arthroscopic Guider Autologous Iliac Crest Bone Graft or Xenograft Combined with Subscapularis Augmentation Using Round-Button in Recurrent Anterior Shoulder Instability: A Prospective Study.

Dlimi, S.,Piovana, P., Fiocchi, A., et al.

DOI: https://doi.org/10.1016/j.jse.2021.03.009

Aim
We hypothesized that a specific guide can improve the positioning of the graft and bicortical buttons' fixation can decrease screws related complications' rate.

Background
Glenoid bone-loss is a challenging problem in setting of recurrent anterior shoulder instability (AGHI).Arthroscopic Latarjet, Autologous Iliac Crest Bone Graft And Xenograft are commonly utilized in patients with glenoid bone-loss >13 % or with significant risk factors for recurrence; both provided excellent functional results but high revision rates for screws related problems.

Methods
Patients affected by AGHI with bone loss from 2016-2019 were prospectively enrolled.
Preoperative X-ray, arthro-MRI and CT were performed.
Clinical exam in the pre and post-operative follow-up included ROM, Apprehension-test, ROWE-score and Subjective Shoulder Value (SSV).
Two differents surgical techniques were performed: 1) Arthroscopic latarjet according to Boileau using 2 Round-button and 2) Autologous Iliac crest bone block or equine Xenograft with Subscapularis Augmentation (ASA) procedure according to Taverna-Russo-Maiotti using 5 Round-Button.
A failure was defined by (compared to healthy shoulder): a)apprehension or recurrence, b) ROM reduction (except ER1-2)>25%, c) reduction of ER1-2>50% d) non-integration of the graft e) Hardware Cortical Button faillure

Results
The study involved 20 patients (M:F;19:1), The median age was 30 years (IQR 25-36). After a median follow-up time of 24 months (IQR 14-30), 19 patients (95%) had a significant improvement of the post-operative median Rowe-Score from 52 to 92°($p<0.001$). We observed also a significant improvement of the SSV from 40 to 87%($p<0.001$)
We didn't observe any significant difference in ROM, except in ER. The mean deficit of RE1 was 10°(±5°) and 6°(±5°) in the ER2 compared to healthy shoulder.
One failure case (5%) was observed: one patient had recurrence of dislocation with non-integration of the Bone Block (xenograft).
We observed, at the the CT-scan, an optimal placement of our graft in the 18 patients (90%) , flush and in the half sub-equatorial part of the glenoide.
We registered no infections, no vascular-nerve injuries and no hardware related complications (migration, breakage, torsion, bending and pull-out).

Conclusions
Arthroscopic Latarjet and Bone Block combined with ASA procedure are effective, reproducible treatment with an excellent final outcome in patients affected by shoulder instability.
The Round-Button system with dedicated guide was found to be a reliable fixation system in all cases, ensuring excellent positioning, solid compression and stability of the graft. This system allows graft healing and avoids hardware related complications.

BACK

Associations of Hypo-High-Density Lipoproteinemia with Increments of Preoperative Rotator Cuff Tear Size and with Postoperative Retear.

Park, H.B., Gwark, J.Y.

DOI: https://doi.org/10.1016/j.jse.2021.03.012

Aim
The purpose of this study was to evaluate whether any dyslipidemia is associated with the increments of preoperative tear size and with structural integrity after arthroscopic rotator cuff repair (ARCR).

Background
Recently, several studies have reported that dyslipidemia could be a risk factor for RCT. A small number of clinical studies have reported that dyslipidemia negatively affects structural integrity after ARCR. However, there is little information as to which components of serum lipids play adverse roles in rotator cuff healing.

Methods
We retrospectively evaluated 195 patients (195 shoulders) who had undergone ARCR for degenerative full-thickness RCT between January 2011 and June 2018. We enrolled 100 male and 95 female patients, with a mean age of 60.5 ± 7.5 years. All patients were followed up for at least one year; postoperative cuff integrity was evaluated with ultrasonography. We determined the associated preoperative factors for the increments of tear size and for retear after ARCR, using logistic regression analysis. P value was set at .05.

Results
Age (OR, 1.2; 95% CI, 1.1 to 1.3), diabetes (OR, 3.6; 95% CI, 1.7 to 7.5), and hypo-high-density lipoproteinemia (HDLemia) (OR, 2.9; 95% CI, 1.5 to 5.6) were significantly associated with increments of preoperative tear size ($P < .01$). Diabetes (OR, 3.0; 95% CI, 1.3 to 6.6), critical shoulder angle (CSA) (OR, 2.0; 95% CI, 1.4 to 3.0), and tear size (OR, 2.1; 95% CI, 1.3 to 3.4) were significantly associated with retear after ARCR in overall study subjects ($P \leq .01$). Diabetes (OR, 3.8; 95% CI, 1.3 to 11.4), hypo-HDLemia (OR, 3.0; 95% CI, 1.1 to 8.8), and CSA (OR, 1.5; 95% CI, 1.1 to 2.3) had significant associations with retear after ARCR in patients with large to massive preoperative tear size ($P \leq .04$).

Conclusions
Preoperative hypo-HDLemia has a significant association with the increments of preoperative tear size, and with retear after ARCR in large- to massive-sized RCT.

BACK

Evaluation of Three Different Rehabilitation Protocols After Rotator Cuff Repair, and the Effectiveness of Water/Pool Therapy. A Randomized Control Study.

Cikes, A., Kadri, F., Lädermann, A.

DOI: https://doi.org/10.1016/j.jse.2021.03.013

Aim
This study aims to assess what is the best rehabilitation protocol for patients who undergo arthroscopic rotator cuff repairs, and the effectiveness of a pool therapy protocol.

Background
Exercises performed in water have shown to improve strength and range of motion in various joint pathologies. Water / Pool therapy can also have benefits in various shoulder conditions.

Methods
Patients who underwent arthroscopic rotator cuff repairs, for small to medium sized rotator cuff tears, with small to moderate retraction of the affected tendon, operated on between 2013 to 2016, were randomized in 3 different groups at the time of surgical indication. Groups:
1. Patients who underwent rehabilitation with physical therapy, with no aquatic protocol. The “Dry group”
2. Patients who underwent rehabilitation with physical therapy, including an aquatic protocol. The “Pool Group”
3. Patients who performed self-rehabilitation only, with no physical therapist. The “Self Group”
Follow-up: all patients were assessed by an independent observer. The mean outcome measures consisted of pre and post-operative SSV, Constant score, and patient satisfaction. Patients were followed-up at 4, 8, 12 weeks post-operatively, as well as 1 and 2 years.

Results
Group 1 (Dry group) and Group 2 (Pool group) showed better Constant scores at 2 months post-operatively, although not statistically significant. However, patients in group 2 (Pool group) showed statically better Constant scores and overall satisfaction at 3 months post-operatively. All groups had similar results at 6 months, 1 year and 2 years post-operatively, with slightly better outcomes for the Dry and Pool groups compared to the Self group.

Conclusions
Water/pool therapy after rotator cuff repair yields better early results compared to traditional “dry” rehabilitation or self-exercise therapy. The results remain better overtime for patients who underwent pool or dry rehabilitation at 1 and 2 years post-operatively compared to the patients who underwent a self-exercise program, although the difference is not statistically significant on the long term.

BACK

Surgery and Physiotherapy Were Both Successful in the Treatment of Small, Acute, Traumatic Rotator Cuff Tears: A Prospective Randomized Trial.

Raneboa, M., Hallgren, H.B., Holmgren, T., et al.

DOI: https://doi.org/10.1016/j.jse.2021.03.015

Aim
We aimed to compare physiotherapy only with surgical repair and physiotherapy in patients with acute traumatic rotator cuff tears

Background
Previous randomized trials on cuff repair have included mainly degenerative tears, but studies on acute traumatic tears are lacking.

Methods
We did a two-center, randomized, controlled trial of patients with previuosly symptom-free shoulders and with small traumatic rotator cuff tears mainly involving supraspinatus, comparing surgical repair (n=32) and physiotherapy (n=26). Primary outcome was group difference in Constant-Murley (CM) score at 12 months follow-up. Secondary outcomes were differences in Western Ontario Rotator Cuff index (WORC), pain (Numerical Rating Scale 0-10; NRS) and quality-of-life (EQ-VAS). We used MRI to assess retear rate, tear progression, fatty infiltration and atrophy.

Results
Mean age was 59.7 years (range 44-77 years), median sagittal tear size was 9.7 mm (range 4-21 mm) and baseline characteristics were well balanced between the 2 groups. The repair group had a median CM of 83 (quartile range [QR], 25) and the physiotherapy group 78 (QR, 22) at 12 months, with between group difference in medians of 4.5 (95% Confidence Interval [CI], -5 to 9; P=0.68). Corresponding values for WORC was 91% (QR, 24) vs 86% (QR, 24), with between-group difference of 5.0 (95% CI, -4 to 9; P=0.62). There was no difference in NRS or in EQ-VAS. Retear was found in 6.5% of repaired patients and tear progression >5 mm in 29.2% of unrepaired patients.

Conclusions
Patients with previously symptom-free shoulders and a traumatic rotator cuff tear with a median sagittal tear size of approximately 1 cm have good results after 12 months either with or without rotator cuff repair. About one third of unrepaired patients had a tear enlargement over 5 mm.

BACK

The Biomechanical Effect of Bone Grafting and Bone Graft Remodeling in Shoulder Instability Patients.

Böhm, E., Sigrist, B., Ferguson, S., et al.

DOI: https://doi.org/10.1016/j.jse.2021.03.029

Aim
To quantify the longitudinal in-vivo biomechanical effect of bone grafting, bone graft remodeling, and glenoid shape in anterior shoulder instability patients by means of patient-specific finite element models.

Background
Individual constitutional differences in the glenoid shape and bone remodeling require a patient-specific and longitudinal approach to evaluate the biomechanical effect of glenoid bone grafting in anterior shoulder instability patients.

Methods
25 shoulders of 24 patients with anterior shoulder instability and anterior glenoid bone loss underwent an arthroscopic iliac-crest bone graft transfer (ICBGT) procedure either with autologous or allogenic bone. Patient-specific finite element simulations based on pre-operative, post-operative, and follow-up computed tomography (CT) scans were used to quantify the bone-mediated stability ratio (SR) and the distance to dislocation. Additionally, the relationship between glenoid morphology parameters and the SR was assessed.

Results
The ICBGT procedure significantly increased the SR and distance to dislocation in the 2, 3 and 4 o'clock direction immediately after the surgical intervention ($p<0.01$) in both, the autograft and allograft group. Although the SR and distance to dislocation decreased subsequently, autografts showed long-term effects on SR and dislocation distance in the 3 o'clock ($p<0.01$) and on SR in the 4 o'clock ($p<0.01$) direction. Allografts showed no significant effect on SR and dislocation distance in long-term follow-up ($p>0.05$). Overall, glenoid retroversion as well cavity depth predicted stability in all four dislocation directions with glenoid cavity depth showing the highest correlations coefficients ($R = 0.71$, 0.8, 0.73 and 0.7 for 2, 3, 4 and 5 o'clock respectively).

Conclusions
The autologous ICBGT procedure biomechanically improves anterior shoulder stability in long-term follow-up whereas the usage of allografts did not show any bone-mediated biomechanical effect at follow-up due to resorption. Furthermore, glenoid depth and version seem to be additional parameters to determine the biomechanical effect and need for glenoid bone grafting in shoulder instability patients next to defect extent measurements.

BACK

Simplified Technique of Arthroscopic Subscapularis Split During Dynamic Anterior Stabilization (DAS).

Ibrahim, M., Narbona, P., Denard, P.J., et al.

DOI: https://doi.org/10.1016/j.jse.2021.03.035

Aim
The purpose of the present study was to analyze the ability to create a subscapularis split by passive external rotation of the arm during dynamic anterior stabilization (DAS).

Background
The subscapularis split is a required but difficult step of several instability procedures includes as DAS, Latarjet, Eden-Hybinette, or open bony Bankart fracture fixation. The arthroscopic creation of such as split in particularly challenging and has been seen as a challenge in the learning curve of arthroscopic bone block procedures or DAS.

The subscapularis split can be performed with several variations: before4 or after the coracoid osteotomy, with inside-out or outside-in approaches, using a knife then scissors to spread the muscle (a common open technique) or an electrocautery to burn the muscle fibers (a common arthroscopic technique). The level of the split can be difficult to establish. The proximity of the axillary nerve and brachial plexus makes its creation inherently risky. Furthermore, it is the natural tendency to begin the split laterally, in the robust tendinous part of the subscapularis, even if the aim should be to spread only the medial and fragile muscular fibers. Consequently, development of a safe and reproducible technique to perform the split, particularly arthroscopically, is appealing. The hypothesis was that this passive technique can a subscapularis split without additional dissection.

Methods
A technique of subscapularis split using the long head of the biceps (LHB) was used in 12 fresh-frozen human cadaveric shoulders. The length of the subscapularis split, post-DAS position of the LHB, and the angulation of the LHB relative to bicipital groove were measured after DAS.

Results
The mean length of the subscapular split after maximal external rotation was 20.4 ± 6.0 mm (range, 10 to 32 mm). The mean elongation of the LHB was 0.6 ± 1.4 mm (range, -1 to +3 mm). The final angle of the LHB relative to the bicipital groove was 45 ± 7 degrees (range, 41 to 67 degrees).

Conclusions
A subscapularis split can be created by passive external rotation of the arm after the LHB is shuttled into the joint during DAS. Therefore, there is no need to create a distinct split prior to DAS. Additionally, the DAS maintains the length-tension relationship of the LHB. The post-procedure medial angulation of the LHB relative to the bicipital groove may provide a lowering of the subscapularis, helping explain the anterior reinforcement of the technique.

BACK

Arthroscopic Reduction and Transosseous Suture Fixation of Avulsed Displaced Greater Tuberosity Fracture.

Fleega, B.A.N.

DOI: https://doi.org/10.1016/j.jse.2021.03.038

Aim
Aim: This study evaluates the functional and radiographic results of a new arthroscopic reduction and transosseous suture fixation technique in a series of mostly old patients,selected displaced two parts greater tuberosity fractures of the proximal humerus

Background
Background: the results of conservative treatment of the proximal humerus fractures are not satisfactory. Open reconstruction and rigid internal fixation as well as arthroscopic–assisted reduction and internal fixation are only possible in selected cases, mostly young patients. Old patients with osteoporotic, comminuted bone accounts for 70% of the cases.

Methods
Methods: The technique was to reduce the upwards and medially displaced greater tuberosity to its anatomical position and make a longitudinal, horizontal and mattress suture fixation. 23 patients (12 males and 12 females) with a specifically defined displaced fracture of the greater tuberosity underwent arthroscopic reduction and transosseous sutures fixation. The average age was 56 years (between 21 and 79). 66% were above 50 years of age.They were examined with an average follow up of two and a half years (between 12 and 83 months). Follow-up radiographs were assessed for fracture consolidation, malunion, nonunion, heterotopic ossification, and signs of impingement. All displaced fractures were reduced fixed with number 2 non-absorbable sutures. Rehabilitation exercises were started after a postoperative immobilization period of 3 to 4 weeks.

Results
Results: according to Neer classification excellent results were present in all cases of the two parts fracture. All fractures united within four weeks, no nonunion, no heterotopic ossifications and no osteoarthritis or avascular osteonecrosis was detected. Three men and one women active athletes were able to go back to their previous performance.

Conclusions
Conclusion The clinical and radiographic result strongly encourage using the arthroscopic transosseous suture fixation techniques to treat displaced greater tuberosity fractures especially in old age patients or patients with osteoporosis. It is the only method with very good results in this group of patients.

BACK

Arthroscopic Stabilisation of Atraumatic Shoulder Instability: Minimum Two Year Outcomes.

Raja, S., Jassim, S., Butt, D., et al.

DOI: https://doi.org/10.1016/j.jse.2021.03.039

Aim
To assess the safety and efficacy of arthroscopic inferior capsular shift in the context of atraumatic shoulder instability at minimum two-year follow up.

Background
Atraumatic shoulder instability is difficult to treat especially when recalcitrant to physiotherapy rehabilitation. In the absence of instability lesions capsular plication is a treatment option. Surgeons have varying degrees of success with this treatment modality and in our experience, there is a high risk of recurrence though this is not often in keeping with the literature.

Methods
From April 2013 to January 2017, 72 patients with atraumatic instability underwent arthroscopic inferior capsular shift. Patient-reported outcome scores were prospectively collected during routine outpatient follow up, as determined by the local research and innovation committee. These included Oxford Shoulder (OSS), Oxford Shoulder Instability (OSI), pain using a numerical rating system (NRS) and Stanmore Percentage of Normal Shoulder Assessment (SPONSA).

Results
Mean age was 27.4 years with a large female preponderance (46F:26M). Median Beighton score was 5, with 14 diagnosed pre-operatively with a connective tissue disorder. Mean follow up was 2.7 years (range 2 to 5.8 years).
As of January 2019, 59 patients have attended two year follow up. Significant improvements in pain and functional outcomes were seen. Mean pain score improved from 7.3(SE ±0.34) to 2.7(SE±0.35) and mean SPONSA increased from 43.8% (SE±3.31) to 71.6% (SE±2.92). Mean OSS increased from 29.6(SE±1.81) to 39.1(SE ±1.34), while mean post-operative OSI was good at 34.6(SE ±1.47).
At two years, 23 patients (39%) reported instability symptoms, with 5 requiring further stabilisation surgery (8.5%). Using the FEDS (Frequency, Aetiology, Direction, Severity) classification the majority of recurrences were atraumatic anterior subluxations with more than 5 episodes. Subgroup analysis of our recurrent instability group demonstrated age less than 30 (<30 vs >30, p=0.007) and female gender (male vs female, p=0.007) as significant predictors of recurrence. Beighton score (<5 vs ≥5, p=0.297) or direction of instability (anterior vs inferior vs posterior vs multidirectional, p=0.307) were not predictive of recurrent instability. Nor was pre-existing Hill-Sachs or glenoid bone loss.
There was one complication of adhesive capsulitis requiring capsular release.

Conclusions
Arthroscopic inferior capsular shift surgery is an appropriate treatment option for those with atraumatic shoulder instability recalcitrant to conservative measures. Although improvements in stability and functional outcomes can be anticipated it is our obligation to inform patients of the high rates of recurrent instability. Female patients under the age of 30 should be made especially aware.

BACK

Outcomes of Arthroscopic Latarjet As a Revision Procedure for Treatment of Recurrent Anterior Shoulder Instability After Failed Arthroscopic Bankart Repair. A Case Series.

Dzidzishvili, L., Palma, C.C., Valencia, M., et al.

DOI: https://doi.org/10.1016/j.jse.2021.03.042

Aim
To assess subjective and objective clinical outcomes, recurrence and complication rates after arthroscopic Latarjet as a revision procedure after failed arthroscopic Bankart repair.

Background
The role of arthroscopic revision shoulder stabilization after failed anterior shoulder instability repair is still a matter of debate. To our best knowledge, there are no studies describing outcomes of arthroscopic Latarjet revision surgery for anterior shoulder instability after failed arthroscopic Bankart repair.

Methods
Between 2009 and 2018, sixty-two patients with either one (n = 46), two (n =12), or three (n = 4) arthroscopic previous stabilizations underwent revision surgery using arthroscopic Latarjet technique. Clinical outcomes at a minimum of 38 months postoperatively included Rowe score, the Western Ontario Shoulder Instability Index, Constant-Murley Shoulder Outcome score and Single Assessment Numeric Evaluation. Dislocations, subluxations, complications and pre and postoperative level of activity were assessed.

Results
Fifty-five shoulders (88.7%) were subjectively graded as good to excellent using Single Assessment Numeric Evaluation. The mean Rowe and Constant-Murley Scores increased from 43.7 to 94.1 ($p<0.001$) and from 47.7 to 94 ($p=0.032$), respectively. Western Ontarioa Shoulder Instability Index decreased from 1262 to 510 at the final follow-up ($p=<0.001$).
Four recurrent dislocations were reported (6.4%). In two failed cases an Eden-Hybinette procedure was conducted as bone block osteolysis was observed and in remaining two patients extraarticular anterior capsular reinforcement was performed. One case of fracture of the transferred graft and a single case of graft non-union were found; in both cases have no significant influence on the clinical result. One case of stiffness was reported and was resolved with rehabilitation and self-stretching exercises. No neurological complication was recorded. Patients had more problems in returning to previous level of sports participations ($p= 0.017$).

Conclusions
Arthroscopic Latarjet procedure after failed arthroscopic Bankart repair seems to provide a satisfactory option as a revision surgery with good to excellent objective as well as subjective patient-reported outcomes with a low recurrence and complication rates. However, no improvement in postoperative level of sports participation was observed.

BACK

Recurrent Instability in Patients with a Rotator Cuff Repair After a Traumatic Shoulder Dislocation.

Marsalli, A., De Dios Errázuriza, J., Glavic, P., et al.

DOI: https://doi.org/10.1016/j.jse.2021.03.051

Aim
Describe incidence of recurrent glenohumeral instability in active patients with an isolated rotator cuff repair after a traumatic shoulder dislocation. The secondary objectives are to asses risk factors for redislocation and to describe the incidence and causes of re-intervention.

Background
The incidence of rotator cuff tears after a shoulder dislocation increases with age after 40 years. Rotator cuff repair should be the essential procedure in symptomatic patients and refixation of the capsulolabral complex has been recommended as additional stabilization surgery for active patients under 60 years old. However, we still do not know the incidence of shoulder instability recurrence after an isolated rotator cuff repair and no additional stabilization procedures in active patients after their first traumatic shoulder dislocation.

Methods
Retrospective cohort study. Consecutive patients between years 2014 and 2018 in a single trauma center were reviewed. All patients included had a working accident and were under our national workers' accidents insurance law. Inclusion criterias were: first traumatic anterior shoulder dislocation; had a repairable rotator cuff tear; underwent a primary arthroscopic rotator cuff repair; did not have a labral or bony bankart repair and had at least 1 year of follow-up. We excluded patients with prior shoulder surgery, concomitant proximal humerus fractures and with an anterior glenoid fracture greater than 20% of the glenoid surface area. Shoulder instability recurrences and surgical reinterventions were reviewed on medical records of each patient. A shoulder instability recurrence was defined as any self-reported episode of subluxation or dislocation. A statistical analysis was performed for qualitative variables with Chi-square test. Statistical significance was considered $P \leq 0.05$.

Results
106 patients with a mean age of 55 years (22-75) and 3.6 years of follow-up (1.1 - 6) were included. There was one redislocation episode (0.94%) in the total sample, 2.5 years after surgery. He was treated surgically. Age, subscapular tears, bony bankart injuries, humeral defects and associated neurological injuries were not a risk factor for recurrence in this study group. 11 patients (10,4%) required a reintervention. Ten patients (91%) because of a rotator cuff re-tear.

Conclusions
The incidence of redislocation in active patients with an isolated rotator cuff repair after a traumatic shoulder dislocation was less than 1%, regardless of age, presence of significant Hill-Sachs injuries, anterior glenoid defects, size of rotator cuff injuries and tendon re-tears. The incidence of re-interventions was 10% and the main cause was a symptomatic rotator cuff re-tear.

BACK

Dermal Patch Augmented Versus Standard Rotator Cuff Repair: Randomised Controlled Trial.

Amit, P., Snow, M.

DOI: https://doi.org/10.1016/j.jse.2021.03.055

Aim
The aim of this study was to compare the patient reported outcome measures (PROMS) and cuff healing at 12 months between standard and augmented rotator cuff repair with human acellular dermal patch.

Background
Recurrent rotator cuff tear following repair has been reported in up to 60% of cases. Maximising mechanical repair through double row fixation has failed to significantly improve healing rates, consequently, there is focus on the biological enhancement of healing. Patch augmentation is one method to augment repair, however, there are very few comparative studies assessing their efficacy.

Methods
A randomised controlled trial was conducted over patients undergoing arthroscopic repair of rotator cuff tear measuring between 1-5 cm. Patients were excluded for associated osteoarthritis, irreparable tear, or significant subscapularis tear. A total of 63 patients were recruited to the study between 2016 - 2019. Twenty-three patients were excluded leaving 40 patients in the final study population. They were randomised to one of two groups: augmented (cuff repair with human acellular dermal patch) and standard (double-row arthroscopic cuff repair). Functional assessment was performed at 3, 6, 9, and 12 months post-surgery with rotator cuff healing quantified on MRI scan at 12 months using Sugaya's classification. Functional outcome was assessed using American Shoulder and Elbow score (ASES), Quick Disability of Arm, Shoulder and Hand (Quick-DASH) score, Constant-Murley score and Western Ontario Rotator Cuff (WORC) index. Statistical analysis was performed with chi-square, paired and unpaired t-test to compare the outcomes between the two groups.

Results
The mean age in the augmented group was 65.75 and 69.25 years in standard group. The male:female ratio was 11:9 in the augmented group and 12:8 in the standard group. There was no significant difference in age, gender, tear size and pre-operative PROMS ($p<0.05$) between groups. The mean ASES, Quick-DASH, Constant, and WORC improved from 35.91, 52.38, 31.58, and 31.11 pre-operatively to 82.43, 14.76, 78.16, and 79.48 at 12 months in augmented; and from 31.95, 50.94, 31.36, and 25.23 pre-operatively to 72, 31.4, 65.42, and 66.78 at 12 months post-operatively in the standard group ($p<0.05$). There was no significant difference in one-year PROMS between the two groups ($p>0.05$). Re-tear (Sugaya grade 4 and 5) was observed in 50% in augmented and 40% in standard group ($p=0.603$).

Conclusions
A human acellular dermal patch augmented cuff repair did not improve functional outcome or healing at 12 months post-surgery compared to standard double row rotator cuff repair.

BACK

Treatment of Massive Irreparable Rotator Cuff Tears: Preliminary Comparative Study of the Surgical Outcome.

Kholinne, E., Koh, K.H., Jeon, I.H.

DOI: https://doi.org/10.1016/j.jse.2021.03.061

Aim
The study aimed to evaluate the outcomes of ASCR with mesh augmentation for the treatment of massive irreparable rotator cuff tears (MIRCTs).

Background
Arthroscopic superior capsular reconstruction (ASCR) is an alternative to treat massive chronic rotator cuff tear with the premise to provide static restraint avoiding upward migration of the humeral head. However, graft tears and their impact on clinical function outcomes following ASCR is still in contentious.

Methods
From 2013 to 2018, patients with MIRCTs who underwent ASCR were retrospectively evaluated. Among them 64 patients who met the inclusion and exclusion criteria were enrolled in this study. Polypropylene mesh was augmented to the fascia lata graft for 30 patients (group M). While 34 patients were without mesh augmentation to the graft, served as control group. The clinical outcome included range-of-motion (ROM), American Shoulder and Elbow Surgeons (ASES) score and visual analog scale (VAS) were assessed preoperatively and at the final follow-up. The radiological parameters included the AHD (Acromio-humeral distance), rotator cuff arthropathy stage, and fatty infiltration. The graft healing was evaluated using MRI.

Results
Both groups showed improvement of clinical and radiological outcomes at the final follow-up. Group M was with higher ASES score improvement (29.1 ± 15.8) compared to control group (18.1 ± 15.9) (p=0.006). The forward flexion and external rotation were improved for Group M (36% and 41%) and control group (27% and 23%) (p=0.003, p=0.004). The graft healing rate was significantly superior in group M (83.3%) compared to control group (58.8%) (p=0.039). AHD was significantly superior in group M (9.08 ± 2.43 mm) compared to control group (6.36 ± 1.80 mm) at the final follow up. Subgroup analysis revealed that failed graft patients were with progression of fatty infiltration and without improvement of rotator cuff arthropathy stage. Healed graft patients were with higher improvement on functional outcome (ASES and forward flexion).

Conclusions
ASCR with mesh augmentation improves graft healing rate. Patients with healed graft had higher improvement on functional outcome. ASCR with mesh augmentation is with encouraging result as to restore superior stability of the shoulder joint.

BACK

The “purse string” technique for anterior glenohumeral instability: long term results.

Consigliere, P., Panagopoulos, G., Leonidou, A., et al.

DOI: https://doi.org/10.1016/j.jse.2021.03.066

Aim
We report the long-term (7-13 years) results of the “purse-string” technique (PST), a simple arthroscopic stabilisation that addresses both the Bankart lesion and capsular stretching.

Background
The use of fewer anchors been cited as a cause of failure. However, this applies to the use of the suture anchors in conventional techniques. Horizontal mattress suture techniques restore better labral height and anatomy. The PST creates a 3-fold repair: Bankart repair, tightening of the capsule with south-to-north capsular shift, and creation of anterior glenoid bumper, using only 1 suture anchor at 4-o’clock position with passing the sutures through the labrum and capsule at 2 and 6-o’clock positions.

Methods
69 individuals (70 shoulders) with anteroinferior post-traumatic instability treated with PST. 55M/14F. Mean age at surgery 30.4 years (16-58). All patients were assessed by independent investigator clinically or by telephone interview at a mean of 116 months postop (84-156 months). Constant score (CS), Rowe score (RS), Walch-Duplay score (W-DS) and return to sport were assessed. Recurrent instability was recorded.

Results
At final follow up, mean CS was 94, RS 93 and W-DS 90. 58/69 participated regularly in sport prior to their dislocation. 55 (97%) returned to the same sport, 67% to the preinjury level. 14 patients participated in high-level competitive sports, 9 returned to full activity, whereas 5 either reduced their level of sport or stopped. 9 patients participated competitively in contact sports - 5 returned to their preinjury level, 4 had stopped. Seven patients had recurrent dislocation post-operatively (10% failure). Of these, 3 had revision arthroscopic stabilization, 1 had revision arthroscopic stabilization with remplissage, 2 had Latarjet procedure, and one patient decided to seek no further treatment.

Conclusions
The long-term results with PST are very encouraging, with high rate of patient satisfaction, high level of return to preinjury sporting activities and a low failure rate.

BACK

The Effects of Rotator Cuff Tear on Shoulder Proprioception.

Candela, V., Carbone, S., Gumina, S.

DOI: https://doi.org/10.1016/j.jse.2021.03.069

Aim
Little information regarding impaired proprioception in shoulder injuries is known. Our aim was to to evaluate the effects of rotator cuff tear (RCT) and its severity on shoulder proprioception.
Background
Alterations in proprioception caused by different musculoskeletal disorders have been detailed studied in lower extremities pathologies such as knee injuries, ankle sprains and also in cervical and lumbar spine disease.

Methods
We studied 132 consecutive patients (67M-65F;mean age±SD:66.03±9.04;range:43-78) who underwent arthroscopic rotator cuff repair. Tear size was determined intraoperatively. The control group included 82 subjects (38M-44F;mean age±SD:65.87±8.06;range:41-75) with no RCT. All participants, wearing an eyes mask, were submitted to the evaluation of the joint position sense (JPS) at 30°, 60°, 90°, 120°, 150° of shoulder forward flexion during the sitting position, using a digital inclinometer securely attached to the subject's arm using hook-and-loop straps. The passive placement and active replacement method was used; the order of the tested angles was randomly selected. The entire test was repeated three times. The error score, by averaging the three trials, was measured as the absolute difference between the target angle and the observed angle. Statistics were performed.

Results
The intraclass correlation coefficient for all degrees of flexion movement measured was > 0.90, exhibiting a very high correlation.
We found significant differences between cases and controls, regarding the results of joint position sense error at all measurements ($p<0.05$).
According to RCT size, we found significant differences between groups at 30° ($F=27.27$, $p<0.001$), 90° ($F=5.37$,$p=0.006$), 120° ($F=10.76$,$p<0.001$), and 150° ($F=30.93$,$p<0.001$) of shoulder flexion; in details, patients with massive RCT showed greater absolute error value than those with both small and large RCT at 30°, 90°, 120° and 150° of shoulder flexion ($p<0.05$).

Conclusions
RCT provokes an alteration of shoulder proprioception, evaluated as the loss of joint position sense, and the impairment is related to tear severity.

BACK

Infection in Revision Instability Surgery? Results of a Prospective Multicenter Consecutive Cohort Study.

Orban, C., Sandman, E., Davies, J.H., et al.

DOI: https://doi.org/10.1016/j.jse.2021.03.071

Aim
To document the infection rate in shoulder instability revision cases and describe its clinical impact.

Background
Recurrent anterior shoulder instability (RASI) can be treated by arthroscopic Bankart or open surgery. Arthroscopic surgery has a recurrence rate of 17%, leading to 6% revision procedures, while open surgery (Latarjet) has a lower recurrence rate (1-2%) but the reoperation rate still remains of 4%.

Methods
Revision cases from a prospective multicenter study begun in 2009 on primary and revision RASI surgeries, the LUXE study, were classified in two categories. 1) Patients initially operated in our centers and already in the LUXE cohort who underwent revision surgery: the LUXE revision group. 2) Patients who underwent surgery in another center initially and joined the study following a complication: the referred revision group. Follow-up was at 3, 6, 12 months and yearly after revision surgery. The WOSI and Quick DASH were taken pre-operatively and at each follow-up to characterize function. Chen et al.'s strict method of tissue sampling was used for cultures.

Results
A total of 262 cases are now included in the LUXE study. Twenty-six patients met the inclusion criteria with a mean follow-up after revision surgery of 1.4 years. The mean age is 29 years old with a majority of men (n=22, 85%). Twenty-four patients had an arthroscopic repair and 2 patients underwent an open Latarjet procedure as the primary surgery. The reasons for reoperation were: recurrent dislocation in 25 cases and screw complication for one patient. The LUXE revision group included 14 patients and 12 were in the referred revision group. Among all revisions, 15 had cultures taken and eight patients had confirmed microbiological infection with Cutibacterium acnes (C. acnes). Seven after an arthroscopic surgery and one following a revised Latarjet procedure. There was no correlation between age, gender, body mass index or smoking status and the risk of positive culture. Patients with positive cultures at the revision surgery showed worse outcomes at the final follow-up compared to revision surgery with a negative culture (WOSI= 1382 versus 871 respectively, p=0.023). At the last follow-up, there was no case of infection or dislocation recurrence.

Conclusions
C. acnes infection was identified in 53% of RASI revision surgeries when cultures were taken. Positive cultures after RASI reoperation were also related to statistically and clinically worse outcomes. To understand stabilization surgery failure, C. acnes cannot be treated lightly and should always be considered in revision surgery.

BACK

Long Term Outcomes After Arthroscopic Transosseous Equivalent Repair: Clinical and MRI Results of Medium to Large Rotator Cuff Tears At a Minimum Follow-Up of 10 Years.

Büyükdogan, K., Koyuncu, Ö, Aslan, L., et al.

DOI: https://doi.org/10.1016/j.jse.2021.03.073

Aim
The objective of this study was to evaluate the long-term functional outcomes and structural integrity after arthroscopic double row TOE repair of rotator cuff tears at a minimum follow-up of 10 years.

Background
Early and midterm outcomes of arthroscopic double row transosseous equivalent (DR-TOE) rotator cuff repair are considered successful however data concerning the long term outcomes are scarce.

Methods
A total of 61 patients with medium to large full-thickness tendon tears treated with arthroscopic DR-TOE by a single surgeon between January 2007 and October 2008 were included. Among them, 52 shoulders of 49 patients (81% of the eligible patients) were available at an average follow-up of 10,7 ± 0,8 years. The mean age at the final follow up was 63 ± 11 years (range, 36-84 years). Tear patterns included 25 isolated supraspinatus, 2 type A, 11 type C and 14 type D according to Collin's Classification. Absolute and adjusted Constant scores, American Shoulder and Elbow Surgeons (ASES) score, Visual Analog Scale (VAS) score and subjective questions regarding the satisfaction with the procedure were used to evaluate functional outcomes. Magnetic resonance imaging (MRI) was performed to evaluate tendon integrity (84% of shoulders). According to Sugaya Classification, type 4 and 5 were considered as re-tears.

Results
The absolute and adjusted Constant scores, ASES scores and VAS scores significantly improved from preoperatively (absolute Constant: 51.3±3.8; adjusted Constant: 57.3±14.4; ASES 45.9±12; VAS: 5.1±1.9 points) to (absolute Constant: 84.3±9.1 [p=<0.001]; adjusted Constant: 94.5±7.9 [p=<0.001]; ASES 92.8±6.2 [p=<0.001]; VAS: 0.6±0.9 [p=<0.001] points) at the final follow-up. These changes reached each minimal clinically important difference previously reported. MRI revealed re-tear in 9 shoulders (20.4%). Shoulders with intact repairs at final follow-up showed a significantly higher absolute and adjusted Constant scores, but not the ASES and VAS scores compared with the re-tears (absolute Constant: 86.2 ± 7.55 points vs 75.2 ± 10.8 points respectively [p=0.007]; adjusted Constant: 96.7±5 vs 84.4±11.5 points respectively [p=<0.001]). Abduction strength was significantly higher in shoulders with intact repairs compared with the failed repairs (7±2.9 vs 4.88±1.2 kg, respectively [p=0.037]). 84% of patients were very satisfied with the clinical outcome of the procedure.

Conclusions
Arthroscopic double row TOE repair of rotator cuff tears provided improved clinical outcomes with an acceptable re-tear rates at long term follow-up. Superior clinical outcomes of patients with intact tendons may provide insight into future research focusing on tendon healing and repair integrity.

BACK

Arthroscopic Knotless Separate Layer Transosseous Equivalent Repair of Delaminated Rotator Cuff Tears.

Büyükdogan, K., Koyuncu, Ö, Eren, I., et al.

DOI: https://doi.org/10.1016/j.jse.2021.03.075

Aim
In this surgical technique, we aimed to describe our preferred method that anatomically repairs both layers of delaminated rotator cuff tear separately in a knotless transosseous equivalent manner.

Background
Delamination of rotator cuff tears presents a challenge for surgeons. Recognizing and repairing such a complex tear pattern often require innovative approaches to achieve an anatomic restoration of footprint.

Methods
After diagnostic arthroscopy, the rotator cuff tear is assessed. Two No. 2 FiberWire sutures are placed to the articular layer in cinch stitch configuration. Then FiberLink sutures are passed through both layers while keeping the closed-loop end at the working portal. The free ends of cinch stitches are loaded to 4.75-mm SwiveLock anchors with a preloaded FiberTape Loop, which is placed to the medial row while approximating the articular layer onto its footprint. FiberTape sutures are then shuttled through both layers of tendon with the help of the previously placed FiberLink. Finally, lateral row anchors are placed while fiber tapes are tensioned in a cross-bridge configuration to complete repair. If dog-ear deformity is anticipated, an additional FiberLink or No. 2 FiberWire tip retention suture of SwiveLock anchors can be passed through the deformity in a cinch configuration and loaded into the anchor with fiber tapes before fixation of the lateral row.

Results

Conclusions
We believe that this technique may facilitate uneventful healing of delaminated rotator cuffs by providing the biomechanical properties of transosseous equivalent repair.

BACK

Ultrasound Assisted Intralesional Methylene Blue Injection for the Arthroscopic Decompression of Spinoglenoid Notch Cyst Causing Suprascapular Neuropathy.

Büyükdogan, K., Altintas, B., Koyuncu, Ö., et al.

DOI: https://doi.org/10.1016/j.jse.2021.03.076

Aim
We aimed to present our technique for arthroscopic spinoglenoid cyst decompression following preoperative ultrasound-guided methylene blue injection.

Background
Symptomatic spinoglenoid ganglion cysts is a rare cause of shoulder pain and disability. Surgical treatment may be considered in patients after failed nonoperative treatment and includes open or arthroscopic cyst debridement. Arthroscopic treatment is a less invasive way and has the advantage of addressing intraarticular pathologies, however exposure of the cyst may deem difficult. Furthermore, suprascapular nerve is susceptible to iatrogenic injury due to its close proximity to the posterior glenoid rim.

Methods
In brief, with the probe used to visualize the cyst in the axial plane, an 18 gauge needle is directed into the cyst in a medial-lateral direction. Once the needle tip has been inserted into the cyst in real-time imaging, 2-3 ml of methylene blue is injected into the cyst, paying attention to the underlying suprascapular nerve. A arthroscopic rasp is inserted through the posterior portal and the torn or frayed labrum is elevated gently to visualize the spinoglenoid cyst. The arthroscope is switched to the anterosuperior portal to assess the posterior labrum. An accessory posterosuperior portal is established to be used as a working portal. Next, a shaver is introduced from the posterior portal. After careful debridement of the soft tissue posterior to the scapular spine, the cyst can be distinguished as a large, dull, blue tinged structure which bulges into the joint cavity. At this time, the cyst can be decompressed safely using the shaver. Viscous and bluish fluid egress into the joint cavity confirms decompression of the cyst. To avoid neurovascular injury, neither the shaver nor any instruments were advanced beyond 1 cm medial to the posterior border of the glenoid. Carrying on debridement until the washout of methylene blue confirms the adequate decompression of the cyst. Then the bone under the posterior labrum is debrided to create a bleeding bone bed to facilitate healing of the labrum while avoiding any additional damage to the labrum. The senior author prefers labrum debridement in cases with posterosuperior labrum tears without associated instability of the shoulder. Labrum repair is reserved for those, who present with posteroinferior labrum lesions and/or associated symptomatic instability.

Results

Conclusions
We believe that this technique may facilitate uneventful decompression of symptomatic spinoglenoid notch cysts while preventing iatrogenic suprascapular nerve injury.

BACK

Microbiological Analysis of Post-Operative Shoulder Infection: Retrospective Multicenter Study Over a Seven-Year Period in Trauma, Arthroplasty and Arthroscopy.

Orban, C., Leduc, J.M., Sandman, E., et al.

DOI: https://doi.org/10.1016/j.jse.2021.03.077

Aim
To describe patient and surgical characteristics of post-operative shoulder infection (POSI) to help guide initial empiric antibiotic selection when infection is suspected during shoulder revision in trauma, arthroplasty and arthroscopy.

Background
POSI presents very differently than in hip and knee cases, as it usually involves Cutibacterium acnes (C. acnes).

Methods
A multicenter retrospective study from 2010 to 2016 reviewed laboratory databases and medical archives to identify patients who underwent shoulder surgery and had a confirmed shoulder infection. Patients included could have undergone the following procedures: arthroplasty (AP), arthroscopy (AS), fracture fixation (FF) or another open surgery (OS). A confirmed shoulder infection was defined as two positive cultures or more of the same bacteria or clear clinical infection with one positive culture or more.

Results
Among the five participating hospitals, 90 POSI cases were identified, involving 28 surgeons. Mean age was 59 years at first surgery (Range: 22 – 91) with a majority of men (n = 67, 74 %). Arthroplasty was the most common index surgery (AP= 40 (44 %), FF= 27 (30 %), AS= 15 (17 %), OS= 8 (9 %)). The median time between the index surgery and the first positive sample was five months with a mean of 23 months, (min 6 days – max 27 years), illustrating a positively skewed distribution.
C. acnes was identified in 58 patients (64 %) and was the most frequent germ in all four surgical groups: AP = 28 (70 %), FF = 12 (44 %), AS = 14 (93 %) and OP = 4 (50 %). In 88 % of cases, C. acnes was identified at the first revision. The other two most common germs were: Staphylococcus epidermidis (S. epi) and Staphylococcus aureus (S. aureus), similarly represented with 27 % and 18 % respectively. Polymicrobial infection was present in 31% of patients.
Gender analysis revealed that C. acnes was twice as frequent in males (male = 51 (76 %); female = 7 (30 %), $p<0.001$). Indeed, the microbiological profile of female patients was significantly different, with the most prevalent germ being S. epidermidis (n=11, 48 %) compared to 19% in men.

Conclusions
In empiric antibiotherapy following POSI, C. acnes, S. epidermidis and S. aureus should be covered. There is a significant gender difference regarding POSI culture results, but C. acnes should still be covered in women as it is found in 30% of cases. Possible gender difference in POSI microbiology should be explored further.

BACK

Long-Term Results of Arthroscopic Reduction and Fixation of Anterior Glenoid Rim Fractures.

Maziak, N., Kecka, A.U., Minkus, M., et al.

DOI: https://doi.org/10.1016/j.jse.2021.03.089

Aim
The aim of the present study was to evaluate clinical and radiographic long-term results of an arthroscopic reduction and fixation of acute displaced large solitary or multifragmented anterior glenoid rim fractures using anchors or bioabsorbable compression screws.

Background
The optimal treatment of anteroinferior glenoid rim fractures is still a matter of debate.

Methods
Nineteen patients (13♂, 6♀, Ø61 years) could be evaluated after a mean (± SD) follow-up of 10±2 years. Clinical outcome was assessed using the Subjective Shoulder Value (SSV), Constant Score (CS), Rowe Score (RS), Western Ontario Shoulder Instability Score (WOSI) and Melbourne Instability Shoulder Score (MISS). True anterior-posterior, axillary and Bernageau views were obtained for radiographic evaluation.

Results
The patients reached a mean SSV of 92±12 %. The average CS was 90±11 points, the RS was 86±15 points. The mean WOSI averaged 98±2 % and the mean MISS was 88±11 points. No patient had suffered a recurrent dislocation. Radiographic results were obtained from sixteen patients. Signs of osteoarthritis were noted in a total of six patients. Worse clinical results were noted for the WOSI and RS in patients with osteoarthritis. These differences, however, were non-significant.

Conclusions
Arthroscopic reconstruction of acute large solitary and multifragmented fractures of the glenoid rim shows good clinical long-term results. Osteoarthritis can be observed in about one-third of all patients and seems to be associated with slightly worse clinical outcomes.

BACK

Do Champagne Toast and Champagne Pour Clinical Tests Correlate with Location and Size of Rotator Cuff Tears?

Naylor, A.J.,Rao, A.J., Cvetanovich, G., et al.

DOI: https://doi.org/10.1016/j.jse.2021.03.091

Aim
To evaluate the clinical utility of preoperative “Champagne Toast” and “Champagne Pour” positions of the shoulder for manual muscle testing in the physical examination of patients with known rotator cuff tears undergoing rotator cuff repair (RCR) with regard to tear location and size.

Background
The “Champagne Toast” and “Pour” arm positions of manual muscle testing revealed a better isolation of supraspinatus activity compared to the Jobe test in a previous EMG study. However, these positions have not been tested formally in patients with rotator cuff tears.

Methods
77 consecutive shoulders undergoing arthroscopic RCR were analyzed. There were 31 (40%) female and 46 (60%) male with an average age of 57.8 years (40-76). An independent examiner performed manual muscle test examination trials for Toast, Pour, Jobe test, External rotation (ER) at side, and Belly press. The results of clinical pain and weakness responses were classified preoperatively. Intraoperatively, tear size (A-P, M-L dimensions), tear location (anterior, central, and/or posterior within the supraspinatus), and status of the anterior band of the supraspinatus (intact/not intact) were recorded. We excluded any shoulders with previous surgery, stiffness, or neurologic conditions. Preoperative MRI were independently evaluated for tear location, size, and muscle grading (Goutallier). Descriptive statistical analysis with One-way ANOVA was performed for correlations between the tests and tear dimensions, area, location, and the status of the anterior band of the supraspinatus.

Results
Significant correlations were seen between pain rating in the Champagne Pour position and greater tear area (p=.037) and larger A-P dimension (p=.011). ER at side weakness trended toward a significant association with anterior supraspinatus tear location (p=.062). No significant correlations were seen between other preoperative physical exams and tear location, and no physical exam test results were associated with intraoperative status of the anterior band of the supraspinatus. The Jobe test for either pain or weakness did not clinically correlate to known rotator cuff tear size, location, or area.

Conclusions
The Champagne Pour position of manual muscle testing for supraspinatus activity elicited pain that significantly correlated with supraspinatus A-P dimension and total area of the tear. None of the other manual muscle physical exam tests had significant correlations.

BACK

Adjustable Button and All-Suture Anchors As Suspensory Devices for Arthroscopic Glenoid Rim Fracture Fixation. Surgical Technique and Preliminary Results.

Bampis, I., Zervakis, N., Boutsiadis, A.

DOI: https://doi.org/10.1016/j.jse.2021.03.095

Aim
To present an all-arthroscopic approach for reduction and fixation of anterior glenoid rim fractures.

Background
The treatment of these fractures remains controversial. However, large bony fragments and displacement of more than 10mm can result in shoulder instability and surgical treatment is suggested.

Methods
We describe an all-arthroscopic technique with the use of 3 buttons and 1 suture anchor as a suspensory device. The 30o arthroscope is inserted into the joint through a posterior portal and thereafter one anterosuperior and one anterolateral portal is created. A traction suture is placed on the superior labrum attached to the fragment, making easier its manipulation and reduction through the anterosuperior portal. A custom-made glenoid guide with a 6mm offset hook is inserted from the posterior portal and it is placed anteriorly over the reduced fragment. Two parallel 1.5mm K-wires are inserted through both the glenoid and the fragment, at 10mm distance to each other. A 2.8mm cannulated drill bit is used to create the respective bone tunnels. Through the inferior tunnel the bony fragment is usually thicker. At this level the fixation is performed with one adjustable button placed posteriorly and one attached free round button of 10mm placed anteriorly (Toggleloc, Zimmer- Biomet, Warsaw, USA). Through the superior tunnel, the fragment is usually smaller and more fragile. The sutures of a 2.9mm all-suture anchor (Juggerknot, Zimmer-Biomet) are shuttled from anterior to posterior and the anchor is deployed over the bony fragment. The sutures of the anchor are secured posteriorly over a free button (Zimmer-Biomet), using sliding knots.
Finally, the anterior capsule is repaired with a 2.9mm all-suture anchor (Juggerknot, Zimmer-Biomet) that is placed superiorly to the fragment.
The aforementioned technique is performed in 3 patients with a minimum 1 year follow-up.

Results
Anatomical reduction with good bone healing was achieved in all cases. No neurovascular complications were reported. One year post-operatively the mean scores were as follows: ASES 95, SST 11, Constant 93 and SSV 95%. No arthritic changes are found in the latest x-rays.

Conclusions
All arthroscopic fixation of anterior glenoid rim fractures with buttons and soft anchors seems to be a safe and reproducible procedure. Furthermore, with the use of the suture anchors as suspensory devices complications such as breakage of the fragment or overhang of metallic materials inside the joint are avoided.

BACK

The Role of Arthroscopic Glenoidplasty and Osteocapsular Arthroplasty in the Treatment of Advanced Glenohumeral Arthritis.

O'Driscoll, S., Lievano, J.R., Rotman, D., et al.

DOI: https://doi.org/10.1016/j.jse.2021.03.100

Aim
To assess the role of arthroscopic osteocapsular arthroplasty (OCA) (with glenoidplasty as indicated with severe retroversion and biconcave glenoid) for advanced-stage glenohumeral arthritis.

Background
The role of arthroscopy in the treatment of advanced-stage glenohumeral arthritis is controversial.

Methods
We retrospectively identified 67 OCA procedures (33 with glenoidplasty) performed in 57 patients (83% males) from 1995 to 2017. Average age was 61 years (range, 45-82 years). Preoperative diagnoses included primary osteoarthritis in 57 cases (85%) and dislocation arthropathy in 10 cases (15%). Outcomes included the summary outcome determination (SOD) score, range of motion (ROM), complications, reoperation and revision to shoulder replacement. Latest follow-up radiographs were reviewed for glenoid erosion. Survival analyses were performed to estimate how long improvement was maintained over time and the delay to shoulder replacement. Multivariate analysis was performed to identify patients at risk of failed outcome.

Results
Average follow-up time was 6 years (range, 1-22 years). Of the 67 cases, 17 (25%) did not perceive any improvement postoperatively and were considered as failed. The remaining 50 cases (75%) who perceived improvement, reached maximal improvement at a median of 12 months (range, 1-26 months). At that point, according to the SOD score, 4 patients (8%) rated themselves as “improved”, 30 (63%) as "greatly improved”, 13 (27%) as “almost normal” and 1 (2%) as “normal”. This improvement level remained without deterioration a median of 4 years, and despite some deterioration over time, patients remained improved from preoperatively for a median of 11 years. ROM significantly improved at short-term but deteriorated at long-term to the preoperative level. The complication rate was 4.5% (n = 9 and reintervention rate was 9% (n=6). Twenty-six cases (39%) required revision to shoulder replacement. The median time patients could delay shoulder replacement was 13 years. Patients at risk of failed result were those with dislocation arthropathy (OR 18, 95% CI 3.1-89) and those older than 65 years (OR 4.9, 95% 1.2-19). All radiographic follow-up showed a concentric joint without progressive glenoid erosion.

Conclusions
After OCA, a majority of patients had improvement and obviated the need for shoulder replacement for a median of 13 years. These arthroscopic procedures should be considered a viable alternative to shoulder replacement in patients who place high demands on the shoulder or refuse prosthetic replacement, even in the presence of abnormal glenoid morphology. Caution is recommended in patients with dislocation arthropathy and patients > 65 years as they were at higher risk of failure.

BACK

Dynamic Anterior Stabilization (DAS) with the Long Head of the Biceps. Preliminary Results.

Collin, P., Hervé, A., Laedermann, A.

DOI: https://doi.org/10.1016/j.jse.2021.03.105

Aim
The goal of this study was to present the preliminary results of a new technique to treat anteroinferior glenohumeral instability.

Background
Shoulder instability is frequent and patients are frequently treated by a coracoïd transfer (Latarjet) or reattachment or the capsulo-labral complex (Bankart). Results of these two technics at long term follow-up are well known. Even if arthroscopic Latarjet has been technically validated with correct midterm follow-up, it remains a challenge. DAS could be an alternative for patients with moderate humeral and/or glenoid bone loss.

Methods
This is a prospective study conducted in 2 centers. Under arthroscopy, the long head of the LHB was transferred within a subscapularis split to the anterior glenoid margin and fixed with an interference screw, thereby creating a “sling effect” by using a conservative technique. A standard Bankart repair was then performed to re-establish the labral damper effect. We included 23 patients of a mean age of (from 22 to 37 yo). 14 were right handed, 7 showed sign of hyperlaxity, 10 practiced overhead sport activities.

Results
The average FU was 18 months (range, 12 to 24 months). The Rowe score improved from 66 to 96. We observed 2 recurrences at the beginning of our experience, reoperated reoperated successfully by a Latarjet procedure. There was no apprehension, the mean elevation was 176° (range, 160° to 180°), ER1 37° (range, 30° to 90°). There was an average lack of ER1 of 8°.

Conclusions
Preliminary results are good. The main benefit of the DAS procedure is that it not only grants the “sling effect”, but is also easier and safer than an arthroscopic Latarjet. Moreover, it does not require screws nor traction of the coracoid process, and should consequently reduce the risks of neurologic damage. Furthermore, graft overhang and cortical resorption, hence reducing the probability for dislocation arthroplasty. Lastly, the pectoralis minor remains intact, which would avoid scapular dyskinesis. Nevertheless, longer follow-up is required.

BACK

Arthroscopic Eden-Hybbinette for Revision of Failed Latarjet.

Boileau, P., Duysens, C., Lemmex, D.

DOI: https://doi.org/10.1016/j.jse.2021.03.107

Aim
To report the results of an all-arthroscopic Eden-Hybbinette procedure, using suture-button fixation (rather than screw) for graft fixation, in a series of patients with a prior failed Latarjet.

Background
The incidence of recurrent shoulder dislocation after the Latarjet procedure is low (1% to 5%) and related to bone graft nonunion, migration, resorption with sometimes screw breakage. Attempt at removing the broken screws may lead to further glenoid destruction, whereas leaving the broken screws in place may lead to graft malposition because of wrong hardware trajectory.

Methods
Seven consecutive patients (5 males, 2 females, mean age: 30.7 years (range, 17-47) with recurrent dislocations and glenoid deficiency greater than 20% underwent the all-arthroscopic revision procedure. The initial coracoid graft was either too low (3), too high (2), migrated (5), or non-united (2). The iliac crest bone graft (ICBG) and suture-button device (Bone-LinkTM, Smith & Nephew, Andover, MA, USA) were shuttled through the rotator interval. Specific drill guides and a suture tensioning device allowed bone graft compression. A capsulo-labral repair was performed in all patients and a Hill-Sachs remplissage in three. In 3 patients, broken screw shafts were left in situ. Graft placement and healing was assessed postoperatively with computed tomography (CT) imaging.

Results
At a mean follow-up was 31 months (range 24–49 months), no hardware failures or migration was observed, and no patients needed further surgery. Overall, all patients but one was satisfied and had a stable shoulder; five were able to return to sports activities without any apprehension. The mean Constant score increased from 32 to 81 points and the Subjective Shoulder Value from 31% to 87% ($p<0.001$). The Walch-Duplay and Rowe scores averaged 85.7 points (range 65-100) and 86.4points (range 70-100), respectively. On CT-scan, all bone blocks achieved union with optimal positioning (flush and subequatorial), including the 3 cases where broken screws were left in the glenoid vault.

Conclusions
The arthroscopic Eden-Hybbinette is a safe and reliable procedure for the treatment of failed Latarjet. The arthroscopic technique allows for preservation of the subscapularis, thus minimizing risk to the anterior neurovascular structures; it also gives the possibility to simultaneously address other associated lesions (capsular deficiency and humeral bone loss). The use of a suture-button device simplifies graft transport and positioning, while providing adequate fixation for healing; it also facilitates management of broken hardware, which can be left in place in the glenoid vault.

BACK

Analysis of Patients That Did Not Return to Play Following Arthroscopic Bankart Repair.

Hurley, E.T., Davey, M.S., Gaafar, M., et al.

DOI: https://doi.org/10.1016/j.jse.2021.03.108

Aim
The purpose of this study was to analyze patients that did not return to play following arthroscopic Bankart repair.

Background
Arthroscopic Bankart repair is the most commonly performed procedure for anterior shoulder instability worldwide, and post-operatively being able to return to play is one of the most important outcomes.

Methods
A retrospective review of patients who underwent primary arthroscopic Bankart, and subsequently did not return to play after a minimum of 24-month follow-up was performed. Patients were evaluated for their psychological readiness to return to sport using the Shoulder Instability-Return to Sport after Injury (SIRSI) score. A SIRSI score > 56 is considered a passing score for being psychologically ready to return to play. Additionally, reasons for not returning to play, Visual Analogue Scale for pain (VAS), Subjective Shoulder Value (SSV), satisfaction and instability symptoms were evaluated.

Results
The study included a total of 50 patients who were unable to return to play, out of 247 total patients. There 40 males (80%) with a mean age of 27. Ten patients (20%) passed the SIRSI benchmark of 56, with a mean overall score of 37.7 +-22, in those who returned 74.6% passed the SIRSI benchmark of The lowest scoring question on the SIRSI questionnaire was patients found it frustrating to have to consider their shoulder when playing. The most common primary reasons for not returning were 23 felt physically unable to return with persistent pain/apprehension, and 18 felt it was a natural end to their career or their lifestyle had changed. The mean VAS was 2.8 +- 1.9, and the mean SSV was 67.7 +-24.8. Seven patients (14%) underwent further shoulder stabilizations, with 26 (52%) having noted apprehension. Six patients were dissatisfied with their surgery (12%).

Conclusions
Following arthroscopic Bankart repair, those that do not return to play exhibit poor psychological readiness to return to play which may be due to residual pain or instability symptoms. Despite this, the majority of patients remain satisfied with their surgery.

BACK

Comparison of Repair Integrity and Functional Outcomes Between Knot-Tying and Knotless Suture-Bridge Arthroscopic Rotator Cuff Repair: A Prospective Randomized Clinical Trial.

Sahin, K., Senturk, F., Ersin, M., et al.

DOI: https://doi.org/10.1016/j.jse.2021.03.109

Aim
To compare clinical and structural outcomes of two arthroscopic suture bridge (SB) rotator cuff repair (RCR) techniques which are medial knot-tying and knotless SB RCR.

Background
Arthroscopic RCR is one of the most commonly performed procedures in routine practice. Recently, new techniques such as SB RCR have been developed in an attempt to improve the results. However, one of the most serious matters after surgery is the retear rate. In recent studies; knot-tying and knotless SB RCR techniques have been evaluated but the results are controversial; each technique has its own advantages and shortcomings. Besides that, there have been few studies comparing clinical and structural outcomes of these two techniques.

Methods
This study is a randomized controlled single-blinded prospective clinical trial. We enrolled 75 patients who underwent arthroscopic SB RCR with a diagnosis of full thickness rotator cuff tear. Regarding the repair technique, 37 shoulders were enrolled in a conventional knot-tying SBT group (group A) and 38 shoulders in a knotless SBT group (group b). The mean age at the time of operation was 53.84±9.89 in group A and 55.63±7.70 in group B. The mean follow-up period was 21.54±7.71 months in group A and 19,91±6,26 months in group B. Clinical outcomes comprised pain scores (visual analogue scale – VAS), range of motion (ROM) values and Constant scores. Structural outcomes were evaluated with postoperative magnetic resonance images (MRI) according to the Sugaya's classification after a mean of 9.4±2.15 months.

Results
There were no differences between two groups regarding age, gender, body mass index, preoperative pain scores, fonctional scores and ROM values as well as anteroposterior extension and retraction size of tear on preoperative MRIs. Mean VAS score decreased from 7.29±1.85 to 1.15±2 in group A and from 7.38±1.77 to 0.95±1.78 in group B ($p<0.01$). Mean Constant score increased from 52.32±13.25 to 87.27±10.87 in group A and from 49.29±19.51 to 87.29±15.47 in group B ($p<0.01$). According to the postoperative MRIs, the retear rate was 18.9% (7/37) in group A and 31.6% (12/38) in group B. Medial cuff failure rate in the retorn shoulders was 71.4% (5/7) in group A and 25% (3/12) in group B. No statistical difference was found regarding clinical outcomes, retear rates and retear patterns between two groups ($p>0,05$).

Conclusions
Both SB RCR techniques achieved succesful clinical outcomes without significant difference between two groups. A higher retear rate was seen in the knotless SB technique, however the difference was not significant.

BACK

Arthroscopic Treatment of Isolated Coronoid Fracture: Results on 47 Patients with 2 Years Minimum Follow-Up.

Guerra, E., Blonna, D., Colozza, A., et al.

DOI: https://doi.org/10.1016/j.jse.2021.03.110

Aim
The purpose of this study is to describe an arthroscopic technique to treat isolated coronoid fractures, even if associated to a lateral collateral ligament (LCL) injury, reporting our clinical and radiographic results on a series of forty-seven patients at 24 months of minimum follow-up.

Background
Coronoid process is a primary constraint of the elbow. When a coronoid fracture is associated with sign of instability surgical treatment is required, regardless size of the fragment. Unfortunately open surgery for coronoid fracture needs aggressive surgical approach. Arthroscopic surgery allows treating coronoid fracture with better intra-articular visualization and less invasiveness, but literature is poor of reported results of a standardized technique on a large group of patients.

Methods
We treated 47 patients with coronoid fractures (without other associated fracture) with arthroscopic reduction and internal fixation (ARIF). In 36 patients of this series, a LCL injury was associated and treated by percutaneous arthroscopic suture in 18 cases or mini-open approach in the other 18 cases. All the patients were evaluated clinically and radiographically at 1, 3, 6 months after surgery and at final follow-up .The Mayo Elbow Performance Index and the rate of complications had been calculated.

Results
At the final follow-up the mean range of motion was 7°-131° in flexion-extension and full prono-supination. No clinical signs of instability were reported in all patients. The mean MEPI was 95 (75-100). All fractures but two healed radiographically after six months. In two cases we saw radiologic signs of non union, not symptomatic. Both of them were not fixed by screws.
No intra-operative complications were reported and no surgery was converted from arthroscopic to open. At 3 months follow up we recorded one case of hardware breakage, surgically removed.

Conclusions
Our study shows good results in a series of patients larger than those described in previous studies. This technique offers to a surgeon expert in elbow arthroscopy a good and safe option to treat coronoid fractures, even if associated to a LCL injury. Furthermore it's very adaptable, allowing different choose of hardware fixation intraoperatively depending on the type of the fracture. Potentially, the less invasiveness and better visualization of the fracture as well as the easier joint stability evaluation of the ARIF could change the indication in patients were the right treatment (between conservative or surgical) is still controversial.

BACK

Arthroscopic Rotator Cuff Repair: Is Healing Enough?

Collin, P., Bagheri, N., Clavert, P.

DOI: https://doi.org/10.1016/j.jse.2021.03.112

Aim
To evaluate whether tendon healing after repair is all that need for good result.

Background
Rotator cuff disease is between the most common cause of shoulder pain and dysfunction. All the patients who have been undergone rotator cuff repair have not experienced good results. It seems that if we have a healed rotator cuff the scenario is finished and the patient would have a normal shoulder but the case is not as straightforward. We wanted to evaluate of functional scores and outcomes of patient with healed tendon after surgery and

Methods
We included 188 patients with healed tendon after arthroscopic repair of isolated supraspinatus tear. Healing was determined by ultasonography at 1 year after surgery and were classified according to Sugaya classification(Sugaya 1,2 and 3 included). All the patients were under 70. No shoulder has fatty degeneration more than stage 2 and there were no retraction among tendons. All shoulders were undergone arthroscopic rotator cuff repair with the same double row technique. Postoperative management was the same for all. Constant murley score (CSM) measured in all patients before surgery and until 1 year after surgery in intervals as primary measure.

Results
Age range was between 41 to 70 with mean of 57.57 years. Female to male ratio was 1.14(100 to 87). Preoperative CSM was between 16 to 83 with mean of 53.752 (SD:13.50). Final CMS range from 28 to 100 with mean 79.95(SD:12.054). 23 patients out of 188 patients(12.22%) had scores less than 70 according to Constant Murley scoring system. As the mean score of our patients was 80 and 10 scores of difference in CMS used as minimal clinically important difference(MCID), scores less than 70 shows clinically significant difference. An analysis was done and there was only significant dominancy of females in patients with lower scores(p-value=0.001). No difference was found in age, preoperative CMS, fatty degeneration and other factors.

Conclusions
Our study shows that despite good healing rate of repaired rotator cuff, not all patients with good rotator cuff expriences good outcome. Nearly all literature focus on finding the best way to achieving healing, thereby,evaluating factors affecting improper result of healed tendon is a missing part. It seems necessary to focus more on the elements such as psychological and personality factors to reach our goal in treating patients with rotator cuff tears.

BACK

Preoperative Systemic Administration of Acid Tranexamic to Reduce Intraoperative Bleeding in Arthroscopic Rotator Cuff Repair.

Cenatiempo, M., Distefano, M., Tucci, R., et al.

DOI: https://doi.org/10.1016/j.jse.2021.03.118

Aim
In this study we aim to evaluate the effect of a systemic preoperatory use of TXA in the arthroscopic rotator cuff repairs. In these procedure, TXA could be used to reduce intraoperative bleeding, improve arthroscopic view and decrease pain and stiffness correlated to the bleeding.

Background
Tranexamic acid (TXA) is an antifibrinolytic agent that has been shown to significantly reduce blood loss and transfusion requirements after total knee, hip and shoulder arthroplasty. Recently some papers have showed his efficacy to reduce blood loss, swelling and pain after arthroscopic ACL reconstruction without adverse effects. However, few studies has investigated the effects of TXA in shoulder arthroscopy.

Methods
We designed a prospective, randomized, double-blinded study, in which TXA's effectiveness was tested in a series of consecutive patients treated with arthroscopic repair for isolate injury of sovraspinatus tendon. We examinated the following parameters: intraoperative bleeding (scored with a range 1 - 3), the referred postsurgical pain, evaluated with VAS scale, and the passive range of motion (PROM) at 2, 8 and 30 days after surgery.
The operative treatments were performed by the same team of surgeons with the same surgical equipment.
All lesions were treated with single-row suture anchor. Lesions who required side-to-side suture were excluded.

Results
A total of 30 patients were analysed after randomization and surgery. Fifthteen patient were randomized to the placebo group and fifthteen to the treatment group.
The study groups were not different in terms of age (P .100), sex (P .168) , side of operation (P 1.000), or intraoperative blood pressure BPs (P= .059), BPd (P= .737), BPm (P= .496).
The treatment group showed a significantly lower bleeding during surgery (P .018). Significant differences of time surgery and postoperative pain were not observed.
The PROM score showed a better passive elevation in the treated group after eight days after surgery (P .043). No adverse reactions to TXA were reported.

Conclusions
This study showed the efficacy of TXA in reducing intraoperative bleeding and therefore improve the arthroscopic view in the arthroscopic rotator cuff repair. In addition, patients treated with TXA showed a better passive elevation.
More studies and extensive case studies need to be performed in order to deepen the effects of TXA in shoulder arthroscopy.

BACK

High Return to Sport After Arthroscopic Latarjet for Failed Arthroscopic Bankart.

Olmos, M.I., Clowez, G., Gendre, P., et al.

DOI: https://doi.org/10.1016/j.jse.2021.03.120

Aim
To assess clinical and radiological outcomes after arthroscopic Latarjet procedure for recurrence of instability after arthroscopic Bankart repair.

Background
Patients with recurrence of anterior instability after failed arthroscopic Bankart repair (ABR), who are seeking for revision surgery, usually want to return to sports. Good outcomes have been shown after open Latarjet procedure, but no series had yet reported the results of arthroscopic Latarjet in this indication.

Methods
46 consecutive patients (mean age 29 [range 17-51] years, 36 males) with recurrent anterior shoulder instability after failed arthroscopic Bankart repair were included. Before Bankart repair, mean patient's age was 24 years, ISIS score was 5.7 points (1 - 10), 30 patients were hyperlax and 40 were involved in sports practice. The indication for revision surgery was recurrent dislocation (27 cases) or subluxations (19 cases). Recurrence of instability occurred in average 22 months (1 - 166) after ABR, whereas revision surgery was performed 55 months (8-304) after failed ABR. 41 patients had a Hill-Sachs lesion and all patients had glenoid bone defect (>20%) on imaging studies or during arthroscopy. An associated capsulolabral repair was performed in all, and an additional Hill-Sachs remplissage in two. The mean follow-up was 49 months (24-110) months.

Results
At final follow up, all patients had a stable shoulder at follow-up; 7 patients (17%) presented persistent anterior apprehension. There were two complications (transitory musculocutaneous nerve palsy and one superficial infection) and one re-operation. The mean subjective shoulder value (SSV) was 89% ± 13 and mean Visual analogue scale (VAS) was 1.1 ± 2. The mean Walch-Duplay and Rowe scores were 81 17 points and 82.5 ± 17 points, respectively. Return to sports was achieved in 88% of cases, including high risk sports (contact-overhead) in 15 cases. Arthritic changes (Samilson 1, 2, 3) were observed in 14 (34%) at last follow up, but no patients developed OA with joint line narrowing (Samilson 4). Overall, 42 patients (92%) were satisfied or very satisfied with the revision procedure and all would recommend it.

Conclusions
Arthroscopic Latarjet is a good and safe option for failed arthroscopic Bankart, with high rates of patient satisfaction and return to sport. The arthroscopic nature of the technique offers the possibility to control bone block positioning and simultaneously address other associated lesions (labrum detachment, engaging humeral bone defect, cuff or biceps tendon lesions).

BACK

Arthroscopic Surgery of Rotator Cuff Retear: New Repair Versus Tendon Transfer.

Valenti, P., BouKhalil, C.

DOI: https://doi.org/10.1016/j.jse.2021.03.121

Aim
The main goal of this retrospective monocentric study was to analyse the clinical results of failed rotator cuff repair treated by an arthroscopically aided new repair versus a tendon transfer. The secondary objective was to evaluate whether partial repair associated with tendon transfer could improve the clinical outcome of isolated tendon transfer.

Background
Rotator cuff retear has a prevalence of 20% to 40%. Often well tolerated, for patients symptomatic several surgical techniques have been proposed but any particular technique has proved his superiority.

Methods
Forty four patients were included in this retrospective mono centric study, with a mean age of 55 years (25-77) and a minimum follow-up of 12 months. Twenty two patients underwent new repair arthroscopically using a double-row technique (Group B) when local conditions allowed for a stress-free repair in an anatomical manner or by medializing the attachement site. Twenty two had tendon transfers (latissimus dorsi or lower trapezius assisted by arthroscopy) of which thirteen isolated (Group D) and nine associated with a partial repair of the rotator cuff (Advancement or convergence) (Group C) when the rupture did not seem repairable intraoperatively. The results were evaluated for the overall series as well as each group according to the Constant score, the VAS, the SSV.

Results
For the overall series of 44 patients, all preoperative scores were significantly improved according to the student test: The Constant score increased from 40.4 to 56.3 (ST: 0.09), the VAS from 5.9 to 2.4 (ST: 0.49) and the SSV: 44.5 to 66.4% (ST: 0.04).
The group of isolated tendon transfer (Gr D) had an average final Constant score of 43.8 and SSV of 59.1% lower than the groups of new repairs (Constant 64.6, SSV 72.2%) or partial repair associated with a tendon transfer (Constant 63.8, SSV 72%). The gain was significantly less important for the isolated tendon transfer in term of Constant and SSV scores, but the gain on pain was significantly the same regardless of the group.

Conclusions
The clinical results of the different groups of failed rotator cuff repairs showed improvements in the different scores and a decrease in pain especially in patients treated with a new repair. When a tendon transfer was associated, latissimus dorsi or lower trapezius, partial repair yielded better results than isolated transfer. The isolated transfer relieved the patients but gave them a limited functional gain

BACK

Return to Play After Arthroscopic Repair of Combined Bankart and Type V Superior Labral Anterior-Posterior Tears.

Hurley, E.T., Hogan, R.E., Kilkenny, C.J., et al.

DOI: https://doi.org/10.1016/j.jse.2021.03.123

Aim
The purpose of this study was to evaluate the rate of RTP in patients who underwent combined Bankart and Type V Superior labral anterior-posterior (SLAP) repair in the setting of traumatic anterior shoulder instability.

Background
SLAP tears can occur alongside Bankart lesions in anterior shoulder instability, and classified as Type V SLAP Tears. Currently the literature suggests that SLAP lesions may occur in 22-43% of anterior shoulder instability and remains a difficult diagnostic

Methods
A retrospective review of patients who underwent combined arthroscopic Bankart and SLAP repair and isolated arthroscopic Bankart repair, by a single surgeon between July 2012 and March 2017 was performed. Return to sport, the level of return and the timing of return were assessed. Visual Analogue Scale for pain (VAS), Rowe score, The Shoulder Instability-Return to Sport after Injury (SIRSI) score, and Subjective Shoulder Value (SSV) were evaluated.

Results
The study included a total of 64 patients, with 32 in each group, and a mean follow-up of 62.6 months. Overall, there was no significant difference in the total rate of return to play (90.1% vs 81.3%, p = .4741), but there was a significantly higher rate of returning at the same/higher level in the isolated Bankart repair group (71.9% vs 43.6%, p = 0.0420). Additionally, analyses of the collision or competitive athletes revealed no difference in total rate of return to play (p > 0.05 for both), but there was a again a significantly higher rate of return to play in competitive athletes in the control group (90% vs 55%, p = 0.0310). There was no significant difference in timing of return to play (p = 0.6188). There was a significant difference in favor the control group for the SIRSI score (68.9 vs 57.8, p =0.0499). There were 6 (12.5%) cases of recurrent instability in the combined arthroscopic Bankart and SLAP repair group, and 2 (6.3%) cases in the control group, the difference was not statistically significant (p = 0.2565). Additionally, there was no significant difference in revision rates (15.6% vs. 6.3%, p = 0.4258).

Conclusions
Following arthroscopic repair patients with combined Bankart and Type V SLAP tears had a similar overall rate of RTP to a control group of patients undergoing arthroscopic Bankart repair alone. However, there was a significantly lower rate of RTP at the same or higher level in patients with combined repair for Bankart and SLAP V lesions.

BACK

Muscles Strength and Functional Recovery: Prospective Comparaison Between Arthroscopic and Open Latarget Procedures.

Boyer, P.

DOI: https://doi.org/10.1016/j.jse.2021.03.130

Aim
The goal of this study was to compare the muscle strength and functional recovery after arthroscopic versus open Latarget procedure.

Background
Initially performed using an open procedure, Latarget is also available in arthroscopy that allows excellent graft positioning and no need of hardaware removal. Arthroscopic procedure may improve shoulder functional recovery and early pain relief.

Methods
In this consecutive and prospective serie, 52 patients were enrolled. Inclusion criteria were patients with traumatic reccurent anterior instability treated by latarget procedure, and same rehabiliatation programm.
In the open group, we used mini-invasive delto-pectoral approach and bone block screw fixation.
In the arthroscopic group we used a guided arthroscopic Latarget with suture-button fixation.
Patients were evaluated preoperatively and postoperatively by an independent observator using Walch-Duplay score.
Reccurence of shoulder instability and % return to sport were also assessed.
Early postoperative pain was evaluated on D1, D3, D7 and D 30 using a 10-cm visual analog scale (0-10).
Strength tests were performed using a hand-held dynameter in different positions to assess pectoralis major, supra-spinatus and sub-scapularis, The assessment was performed at 3 weeks, 3 months, 6 months and 12 months

Results
In the immediate postoperative period, the arthroscopy group showed lower pain level compared to open group. At D 30, there was no significant difference.
At the final follow-up, the mean Walch-Duplay scores was 62 in open group and 68 in arthroscopic group. The rate of recurrent instability at 1 year was similar like the % of return to sport.
The open group demonstrated markedly weaker muscles strength than did the arthroscopic group up to 3 weeks and 3 months after surgery in all muscles. There was no differences after 6 months.

Conclusions
In this serie, patients with arthroscopic Latarget experienced better early pain relief and muscle recovery than open procedure.
These results need further studies to be confirmed and encourage to use widely arthroscopic procedure for a faster recovery and return to sport.

BACK

Knee Surgery, Sports Traumatology, Arthroscopy, volume 29, issue 6

The prevalence of intraarticular associated lesions after acute acromioclavicular joint injuries is 20%. A systematic review and meta-analysis.

Ruiz Ibán, M.A., Moreno Romero, M.S., Diaz Heredia, J. *et al.*

DOI: https://doi-org.eur.idm.oclc.org/10.1007/s00167-020-05917-6

Purpose
To synthesise the evidence on the prevalence of associated intraarticular lesions in subjects with acute acromioclavicular joint (ACJ) dislocations.

Methods
A search in two electronic databases (PUMBMED and EMBASE) was performed from 1985 to 2019. Two independent reviewers selected studies that complied with the following inclusion criteria: (1) the study included data on surgically treated ACJ dislocation grade III–V in the Rockwood classification, (2) the ACJ injuries were acute (the surgery was performed less than 6 weeks after injury), (3) an arthroscopic evaluation of the glenohumeral joint was performed during surgery. The quality of the studies included was assessed using the tool of the Joanna Briggs Institute.

Results
A total of 47 studies with acute ACJ injuries met the initial inclusion criteria. Of these, 21 studies (9 retrospective case series, 9 prospective case series and 3 retrospective cohort studies) presented data on associated intraarticular lesions amenable for use in the meta-analysis. The meta-analysed studies included a total of 860 subjects with acute ACJ dislocations with a male/female ratio of 6.5 and a mean age of 32 years. The meta-analysis showed a prevalence of associated intraarticular lesions in subjects with acute ACJ of 19.9% (95% confidence interval [CI] 14.0–26.4%; 21 studies, 860 analysed participants; P = 0.000; I2: 74.5% random-effects model; low risk of bias).

Conclusion
One in five subjects with surgically treated acute ACJ dislocations will have an associated intraarticular lesion that requires further intervention. The case for a customary arthroscopic evaluation of the joint, even when an open procedure is performed to deal with the ACJ dislocation, is strong.

Level of evidence
IV

BACK

The Kite technique: a new all-arthroscopic technique for the treatment of acute acromioclavicular joint dislocation.

Campagna, V., Piccinni, V., Rotundo, G. et al.

DOI: https://doi-org.eur.idm.oclc.org/10.1007/s00167-020-06013-5

Purpose
Although many open techniques have been developed, no all-arthroscopic technique has been introduced to reduce acute acromioclavicular joint dislocation (ACJD) and augment both coracoclavicular (CC) ligaments. The Kite technique is the first all arthroscopic technique with this aim.

Methods
Forty-one consecutive patients [35M–6F; median: 29.2 years (range 23–36)] with acute type III and V acromioclavicular joint dislocation were treated with the Kite technique: it consists of positioning three titanium buttons connected by heavy sutures in an 8-strand configuration between clavicle and coracoid to restore the anatomy of CC ligaments. Patients were followed up for a median of 35 months (range 30–43 months).

Results
Median operation time was 70.6 min (range 58–82), with no cases of intra-operative complications. At the final follow-up, the median post-operative Constant Score and SST were 94.1 (range 89–98) and 11.6 (range 10–12), respectively. At the final follow-up reduction maintenance was present in 39 patients; in one patient, signs of acromioclavicular joint dislocation recurrence were present 3 months post-op. In another patient, medial suture ruptures occurred 4 months after surgery with type II acromioclavicular joint dislocation recurrence but with scarce symptoms and full recovery to sport activity. Clavicle osteolysis was observed in four patients. Cosmetics of the arm were judged as excellent in 39/41. All patients, except two, were satisfied with the final result.

Conclusions
The kite technique is a safe and reproducible arthroscopic procedure to treat acute ACJD. In daily clinical practice, due to the excellent results and the low complication rate, this technique might be considered by surgeons when operative treatment of an acute acromioclavicular joint dislocation is planned.

Level of evidence
IV.

BACK

All arthroscopic coracoclavicular button fixation is efficient for Neer type II distal clavicle fractures.

Kapicioglu, M., Erden, T., Bilgin, E. et al.

DOI: https://doi-org.eur.idm.oclc.org/10.1007/s00167-020-06048-8

Purpose
Neer type II distal clavicle fractures are associated with a high rate of non-union or malunion due to impaired coracoclavicular ligament stability. The purpose of this study was to assess the clinical and radiological outcomes of arthroscopically assisted indirect osteosynthesis for type II distal clavicle fractures using a cortical suture button device.

Methods
Seventeen patients Neer type II fractures of the distal clavicle were treated surgically using cortical suture button fixation between 2012 and 2017. The clinical and radiological results were assessed using the American Shoulder and Elbow Surgeons Shoulder Score (ASES), Constant-Murley score and visual analogue scale (VAS) score.

Results
Anatomic reduction and bone healing were achieved in all patients at the final follow-up. The median age of the patients was 31 years (range 19–57). The mean follow-up was 25.9 months (range 14–64). The average delay before surgery was 2 days (range 1–4). At the final follow-up, the mean ASES, Constant-Murley score and VAS score were 92.6 ± 3.2 (range 84.9–96.6), 96.2 ± 2.4 (range 92–100) and 0.47 ± 0.51 (range 0–1), respectively. All patients were able to resume work as well as sport activities. The postoperative complications included two coracoid process fractures, and none of the patients required additional surgery related to the index procedure.

Conclusion
All arthroscopic coracoclavicular button fixation of Neer type II distal clavicle fractures would provide sufficient stability and union with satisfactory radiological and clinical outcomes. This arthroscopic fixation technique would be more efficient than other osteosynthesis methods because it is a minimally invasive surgery with a low complication rate.

Level of evidence
III.

BACK

Shoulder outcome scoring systems have substantial ceiling effects 2 years after arthroscopic rotator cuff repair.

Jo, YH., Lee, KH., Jeong, SY. et al.

DOI: https://doi-org.eur.idm.oclc.org/10.1007/s00167-020-06036-y

Purpose
Previous studies show no difference in clinical outcomes between patients with healed and structurally failed rotator cuff repairs. The objective of this study was to assess ceiling effects when reporting surgical outcomes of arthroscopic rotator cuff repair using four of the currently most popular clinical shoulder outcome scoring systems.

Methods
Ninety-two patients who underwent arthroscopic rotator cuff repair were examined. The simple shoulder test (SST), American Shoulder and Elbow Surgeons (ASES) score, University of California at Los Angeles (UCLA) shoulder rating scale, and Constant–Murley shoulder score were completed 2 years postoperatively. Demographic data of the subjects were analysed using descriptive statistics. The ceiling effects in the outcome data assessed for each scale were estimated based on two previously reported definitions.

Results
The number of patients with the maximum possible score was 31 (33.7%) with the SST, 26 (28.3%) with the ASES score, 28 (30.4%) with the UCLA scale, and 18 (19.6%) with the Constant–Murley score. The standardised distance of the outcome data assessed by the SST, ASES score, UCLA scale, and Constant–Murley scores were 0.92, 0.97, 0.96, and 1.18, respectively.

Conclusion
The SST, ASES score, and UCLA scale evaluated at 2 years postoperatively have substantial ceiling effects showing that the proportion of patients with the maximum possible score is > 20%, and the standardised distance is < 1.0. Researchers should be aware of possible biases due to ceiling effects when interpreting the results of studies investigating the surgical outcomes of arthroscopic rotator cuff repair. It could increase the likelihood of a type II error.

Level of Evidence
IV.

BACK

Comparable clinical outcomes using knotless and knot-tying anchors for arthroscopic capsulolabral repair in recurrent anterior glenohumeral instability at mean 5-year follow-up.

Wu, I.T., Desai, V.S., Mangold, D.R. et al.

DOI: https://doi-org.eur.idm.oclc.org/10.1007/s00167-020-06057-7

Purpose
To compare rates of recurrent instability, revision surgery and functional outcomes following arthroscopic anterior capsulolabral repair for recurrent anterior instability using knot-tying versus knotless suture anchor techniques.

Methods
Patients who had undergone arthroscopic anterior labrum and capsular repair for recurrent anterior glenohumeral instability using knotless anchors were identified. Those with minimum 2-year follow-up were matched (1:2) to knot-tying anchor repair patients. Rates of failure and recurrent instability were compared, as well as Visual Analog Scale (VAS), Single Assessment Numeric Evaluation (SANE), Quick Disabilities of the Arm, Shoulder and Hand (QuickDASH), University of California Los Angeles (UCLA) and Rowe scores.

Results
One hundred and two patients (89 males, 13 females) with a mean age of 24.3 ± 9.6 were included. Repair was performed with knotless anchors in 34 and knot-tying anchors in 68 shoulders. At mean follow-up of 4.8 ± 2.5 years, re-dislocation rates between groups were not significantly different (knotless anchor: 9% versus knot-tying group: 15%, n.s.), but the knot-tying group showed a higher re-subluxation rate ($p = 0.039$). 12 (18%) revisions were performed in the knot-tying group at a mean 2.9 years after surgery and 1 (3%) revision in the knotless anchors group at 1.4 years (n.s.). There was no difference in mean VAS with use (1.3 ± 1.9 versus 0.8 ± 1.5, n.s.), SANE scores (91.8 ± 12.7 versus 92.0 ± 11.0, n.s.), QuickDASH scores (4.1 ± 5.5 versus 3.0 ± 6.5, n.s.), UCLA Shoulder Score (32.5 ± 3.6 versus 33.2 ± 3.1, n.s.), or Rowe scores (90.5 ± 18.5 versus 92.2 ± 16.6, n.s.) between knotless and knot-tying groups, respectively. VAS at rest was higher in the knotless group (0.7 ± 1.5 vs 0.1 ± 0.4, $p = 0.021$).

Conclusions
Knotless anchors demonstrated similar rates of re-dislocation and revision surgery, and lower rates of recurrent subluxation, compared to knot-tying anchors. Patients achieved good-to-excellent functional outcomes. This supports the efficacy of knotless anchors as an alternative to knot-tying anchors for arthroscopic anterior labral repair of recurrent anterior shoulder dislocation.

Level of evidence
III.

BACK

Acromioclavicular joint arthritis is not an indication for routine distal clavicle excision in arthroscopic rotator cuff repair.

Yiannakopoulos, C.K., Vlastos, I., Theotokatos, G. et al.

DOI: https://doi-org.eur.idm.oclc.org/10.1007/s00167-020-06098-y

Purpose
To evaluate the significance of untreated primary acromioclavicular joint (ACJ) osteoarthritis, encountered during arthroscopic rotator cuff repair (RCR), as a cause of persistent symptomatology and need for revision surgery.

Methods
In a cohort of 811 consecutive patients older than 55 years who underwent RCR, the effect of primary ACJ osteoarthritis presence was prospectively examined. A total of 497 patients with mild/moderate and severe ACJ osteoarthritis based on preoperative MRI evaluation were allocated to Group A (n = 185, symptomatic ACJ) and Group B (n = 312, asymptomatic ACJ). Distal clavicle excision was not performed regardless of the presence of pain. The minimum follow-up was 28 months (28–46). The visual analogue scale (VAS) pain scores were assessed for ACJ pain on palpation, the cross body adduction test, the Constant-Murley, and the American Shoulder and Elbow Surgeons (ASES).

Results
The overall loss to follow-up rate was 3.82% (19 patients: 11 in Group A and eight in Group B). The mean ASES score at the latest follow-up was 91.16 ± 9.3 and 92.37 ± 10.44 in Groups A and B, respectively, and the mean Constant-Murley score was 96.36 ± 5.7 and 95.76 ± 4.6 in Groups A and B, respectively. There was no statistical significance between regarding both scores. Localised ACJ pain on palpation and pain on cross body adduction were diminished in both the symptomatic and asymptomatic group. There were five cases (1%: two in Group A and three in Group B) with persistent ACJ pain who had failed the conservative treatment, and ACJ excision was necessary to alleviate the symptoms. All revision operations were uncomplicated with symptom resolution.

Conclusion
Untreated ACJ osteoarthritis, symptomatic or not, encountered during arthroscopic RCR is associated with a low percentage of failure. Routine distal clavicle excision is not absolutely necessary, even in patients with symptomatic ACJ osteoarthritis.

Level of evidence
II, Prospective cohort study.

BACK

Primary arthroscopic repair of massive rotator cuff tears results in significant improvements with low rate of re-tear.

Haleem, A., Gohal, C., Leroux, T. et al.

DOI: https://doi-org.eur.idm.oclc.org/10.1007/s00167-020-06190-3

Purpose
To conduct a systematic review of outcomes following primary arthroscopic repair of chronic massive rotator cuff tears (RCTs) and to assess clinical outcomes and rates of repair failure. The authors' preferred treatment algorithm is also provided.

Methods
Medline, Embase and PubMed were searched identifying articles pertaining to primary arthroscopic repair of chronic massive RCTs without the use of augmentation. Primary outcomes were patient-reported outcomes and the secondary outcome was the rate of repair failure. Outcome data were pooled and presented as well as assessment of study methodological quality. Data from studies reporting similar outcome measures were pooled when possible, and mean differences alongside confidence intervals and p values were reported, where appropriate.

Results
Twenty-six studies (1405 participants) were included, with mean age of 62 years (range 52–69). The mean duration of symptoms pre-operatively was 31 months (range 6–40), and the mean follow-up time was 39 months (range 12–111). Complete repair was performed in 78% of patients and partial repair was performed in 22%. Both complete and partial repairs resulted in significant improvements with respect to pain, range of motion and functional outcome scores. The rate of repair failure for the total cohort was 36% at a mean follow-up of 31 months, and for the complete and partial repair subgroups the failure rate was 35% and 40%, respectively.

Conclusions
Arthroscopic repairs of chronic, massive RCTs, whether complete or partial, are associated with significant improvements in pain, function and objective outcome scores. The rate of repair failure is lower than previously reported, however, still high at 36%. The present paper finds that arthroscopic repair is still a viable treatment option for massive RCTs.

Level of evidence
IV.

BACK

Arthroscopic Bankart repair with all-suture anchors does not cause important glenoid bone osteolysis: a volumetric CT study of 143 anchors.

Ruiz Ibán, M.A., Vega Rodriguez, R., Díaz Heredia, J. et al.

DOI: https://doi-org.eur.idm.oclc.org/10.1007/s00167-020-06192-1

Purpose
To evaluate with computed tomography (CT) the incidence of anchor-related osteolysis after implantation of two types of all-suture anchors for the management of labral lesions in shoulder instability.

Methods
Single-cohort, observational study with 12-month follow-up. Thirty-three participants (27 males/6 females; age 38.3 years [SD 11.3]) with anterior labral lesions in which 143 all-suture anchors (71 Iconix 1.4 mm and 72 Suturefix 1.7 mm) were implanted were evaluated with a CT performed a mean of 15.4 [3.85] months after surgery. The volume of the bone defects was measured in the CT. Every anchor was classified into one of four groups: (1) no bone defect. (2) Partial bone defect (defects smaller than the drill used for anchor placement). (3) Tunnel enlargement (defects larger than the drill volume but smaller than twice that volume). (4) Cystic lesion (defects larger than twice the drill volume).

Results
No bone defect was identified in 16 anchors (11.2%, [95% CI 6.5–17.5%]). A partial bone defect was found in 84 anchors (58.7% [50.2–66.9%]). Tunnel enlargement was found in 43 anchors (30.11% [22.6–37.6%]). No anchor caused cystic lesions (0% [0–2.5%]). The defect volume was a mean of 27.8 mm3 (SD 18.4 mm3, minimum 0 mm3, maximum 94 mm3). Neither the position in the glenoid nor the type of implant used had a significant effect in the type or size of the defects.

Conclusion
When using all-suture anchors in the glenoid during instability surgery, relevant bone osteolytic defects are rare at 1-year follow-up. Most anchor insertion tunnels will fill completely (11%) or partially (59%) with bone. Tunnel enlargement will develop in 30% of anchors. No cystic defects larger than 0.125 cm3 were observed. There is a low risk that all-suture anchors cause significant osteolytic bone defects in the glenoid. These implants can be used safely.

Level of evidence
IV

BACK

Biologic and synthetic ligament reconstructions achieve better functional scores compared to osteosynthesis in the treatment of acute acromioclavicular joint dislocation.

Saccomanno, M.F., Sircana, G., Cardona, V. et al.

DOI: https://doi-org.eur.idm.oclc.org/10.1007/s00167-020-06217-9

Purpose
To systematically review the outcomes of surgical treatments of acute acromioclavicular joint dislocation.

Methods
Studies were identified by electronic databases (Ovid, PubMed). All studies reporting functional and radiological outcomes of surgical treatments of acute acromioclavicular joint dislocations were included. Following data were extracted: authors and year, study design, level of evidence, number of patients, age, classification of acromioclavicular joint dislocation, time to surgery, surgical technique, follow-up, clinical and imaging outcomes, complications, and failures. Descriptive statistics was used, when a data pooling was not possible. Comparable outcomes were pooled to generate summary outcomes reported as frequency-weighted values. Quality appraisal was assessed through the MINORS checklist.

Results
One hundred and thirty-three studies were included for a total of 4473 shoulders. Mean age of participants was 36.9 years. Mean follow-up was 42.06 months. Arthroscopy showed better ASES ($p < 0.0001$) and lower VAS pain score ($p = 0.0249$) compared to an open approach. Biologic and synthetic reconstructions demonstrated better results over osteosynthesis techniques. Biologic techniques showed overall better Constant ($p = 0.0001$) and DASH ($p = 0.0215$) scores, while synthetic reconstruction showed better UCLA score ($p = 0.0001$). Among suture buttons, triple button showed overall better results in Constant ($p = 0.0001$) and VAS ($p = 0.0001$) scores, while better results in DASH score ($p = 0.0003$) were achieved by 2 double button techniques. Overall, the level of evidence was low.

Conclusion
Biological and synthetic reconstructions achieved better functional scores compared to osteosynthesis. Among suture buttons, the triple button showed better functional performance.

Level of evidence
IV.

BACK

No differences between conservative and surgical management of acromioclavicular joint osteoarthritis: a scoping review.

Soler, F., Mocini, F., Djemeto, D.T. et al.

DOI: https://doi-org.eur.idm.oclc.org/10.1007/s00167-020-06377-8

Purpose
To conduct a scoping review to clarify the management of acromioclavicular joint osteoarthritis, as well as to identify any existing gaps in the current knowledge.

Methods
Studies were identified by electronic databases (Ovid, Pubmed) from their inception up to April 2nd, 2020. All studies reporting functional outcomes after conservative or surgical treatment of acromioclavicular joint osteoarthritis, either primary or secondary to trauma or distal clavicle osteolysis, were included. Following data were extracted: authors, year of publication, study design (prospective or retrospective), LOE, number of shoulders treated conservatively or surgically, patients' age, OA classification, type of conservative treatment, surgical approach, surgical technique, functional outcomes, complications, revisions, and length of follow-up. Descriptive statistics was used. Quality appraisal was assessed through the Cochrane risk of bias tool for LOE I/II studies, while the MINORS checklist was used for LOE III/IV studies.

Results
Nineteen studies were included for a total of 861 shoulders. Mean age of participants was 48.5 ± 7.4 years. Mean follow-up was 43.8 ± 29.9 months. Four studies reported functional results after conservative treatment, whereas 15 studies were focused on surgical management. No studies directly compared conservative and surgical treatment. Seven studies reported a surgical approach after failure of previous conservative treatment. All studies reported functional improvement and pain relief. Complication rate was low. Overall methodological quality of included studies was very low.

Conclusion
Conservative and surgical treatments are both effective in acromioclavicular joint osteoarthritis management. However, available data did not allow to establish the superiority of one technique over another.

Level of evidence
Level IV.

BACK

Patients who have undergone rotator cuff repair experience around 75% functional recovery at 6 months after surgery.

Cho, CH., Bae, KC. & Kim, DH.

DOI: https://doi-org.eur.idm.oclc.org/10.1007/s00167-020-06019-z

Purpose
The purposes of this study were to (1) evaluate changes in recovery patterns [i.e., clinical outcomes, range of motion (ROM)] in the first 12 months following surgery, (2) identify potential prognostic factors of early clinical outcomes after rotator cuff repair (RCR).

Methods
The study cohort included 344 consecutive patients treated with RCR. Data were collected prospectively and included pre- and perioperative variables. Univariate and multivariate linear regression analyses for various parameters including demographics, pre- and perioperative variables were used to predict shoulder function at 12-month follow-up, as measured by clinical outcomes and ROM.

Results
Significant improvement in all clinical scores and ROM were noted during serial follow-ups after RCR (all $p < 0.001$). Multivariate analysis revealed that female sex, older age, more anchors, diabetes mellitus, and preoperative stiffness were independently associated with worse shoulder function 3 months after RCR. Including the 3 months factors, heavy labor, use of the suture-bridge technique, and large tears were also independently associated with worse outcomes 6 months after surgery. Heavy labor, suture-bridge technique, diabetes mellitus, and preoperative stiffness were associated with significantly worse functional outcomes at 12 months after surgery (all $p < 0.05$).

Conclusion
Functional recovery based on clinical outcomes (i.e., UCLA, ASES scores) showed approximately 60% of ultimate recovery at 3 months and approximately 75% recovery at 6 months after RCR. Female sex, diabetes mellitus, preoperative stiffness, a larger number of anchors, suture bridge technique, heavy labor, old age and, larger tears were prognostic factors of poor clinical results or ROM in the short-term follow-up intervals. Knowledge of these prognostic factors may lead to improved insight for physicians to predict the pattern of the recovery and patient expectations accordingly.

Level of evidence
III, A cohort study.

BACK

Increased levels of inflammatory markers in the subscapularis tendon and joint capsule in patients with subacromial impingement.

Farfaras, S., Roshani, L., Mulder, J. et al.

DOI: https://doi-org.eur.idm.oclc.org/10.1007/s00167-020-05992-9

Purpose
To analyze biopsy samples from the subscapularis tendon and from the joint capsule from male patients with subacromial impingement syndrome and compare them with samples from male patients with post-traumatic recurrent shoulder instability, to detect increased inflammatory activity that might be present inside the humeroscapular joint.

Methods
Twenty male patients scheduled for surgery for either subacromial decompression or Bankart reconstruction were included. Four biopsies from each patient were obtained during surgery from the capsule and the subscapularis tendon. Each specimen was analyzed for TNF-α, IL-6, CD-3 and CD-72. Multiplex fluorescence immunohistochemistry was performed on histological samples from the capsule and tendon to demonstrate the level of inflammatory markers. Fluorescence microscope images were acquired using an automated scanning system. On each slide, the number of pixels was registered and used in the analyses.

Results
The subacromial impingement syndrome group comprised eight patients, median age 53 (45–74) years, while the instability group 12, median age 27 (22–48) years ($p < 0.00001$). The amount of IL-6 and TNF-α was significantly higher in the subscapularis tendon of the patients with subacromial impingement syndrome compared with instability patients ($p = 0.0015$ and $p = 0.0008$ respectively). In the capsular samples, significantly higher amount of TNF-α and CD-72 was found in patients with subacromial impingement syndrome compared with instability patients ($p < 0.0001$ for both). On the other hand, the amount of CD-3 was significantly higher in the instability group ($p = 0.0013$).

Conclusions
This study provides evidence that an extended inflammatory process is present, not only in the subacromial bursa but also in the glenohumeral joint in patients with subacromial impingement syndrome.

Level of evidence
Level III.

BACK

Anatomic reconstruction of the acromioclavicular joint provides the best functional outcomes in the treatment of chronic instability.

Sircana, G., Saccomanno, M.F., Mocini, F. et al.

DOI: https://doi-org.eur.idm.oclc.org/10.1007/s00167-020-06059-5

Purpose
To systematically review the outcomes of surgical treatments of chronic acromioclavicular joint dislocation.

Methods
Studies were identified by electronic databases (Ovid, PubMed). All studies reporting functional and radiological outcomes of surgical treatments of chronic acromioclavicular joint dislocations were included. Following data were extracted: authors and year, study design, level of evidence, number of patients, age, classification of acromioclavicular joint dislocation, time to surgery, surgical technique, follow-up, clinical and imaging outcomes, complications and failures. Descriptive statistics was used, when a data pooling was not possible. Comparable outcomes were pooled to generate summary outcomes reported as frequency-weighted values. Quality appraisal was assessed through the MINORS checklist.

Results
Fourty-four studies were included for a total of 1020 shoulders. Mean age of participants was 38 years. Mean follow-up was 32.9 months. Arthroscopic techniques showed better results than open approach ($p < 0.0001$). Synthetic reconstructions demonstrated better functional outcomes compared to internal fixation and biologic techniques ($p < 0.0001$). Among biologic techniques, combined coracoclavicular and acromioclavicular ligaments reconstruction showed better Constant ($p = 0.0270$) and ASES ($p = 0.0113$) scores compared to isolated coracoclavicular ligaments reconstruction; anatomic biologic non-augmented graft reconstruction showed better Constant ($p < 0.0001$), VAS ($p < 0.0001$) and SSV ($p = 0.0177$) results compared to augmented techniques. No differences in functional outcomes could be found between anatomic biologic non-augmented graft versus synthetic reconstructions. Overall, methodological quality of the included studies was low.

Conclusion
Anatomic reconstructions, both synthetic and biologic, showed the best functional results.

Level of evidence
IV.

BACK

Footprint preparation with nanofractures in a supraspinatus repair cuts in half the retear rate at 1-year follow-up. A randomized controlled trial.

Ruiz Ibán, M.A., Sanchez Alepuz, E., Diaz Heredia, J. et al.

DOI: https://doi-org.eur.idm.oclc.org/10.1007/s00167-020-06073-7

Purpose
To evaluate if adding nanofractures to the footprint of a supraspinatus tear repair would have any effect in the outcomes at one-year follow-up.

Methods
Multicentric, triple-blinded, randomized trial with 12-months follow-up. Subjects with isolated symptomatic reparable supraspinatus tears smaller than 3 cm and without grade 4 fatty infiltration were included. These were randomized to two groups: In the Control group an arthroscopic supraspinatus repair was performed; in the Nanofracture group the footprint was additionally prepared with nanofractures (1 mm wide, 9 mm deep microfractures). Clinical evaluation was done with Constant score, EQ-5D-3L, and Brief Pain Inventory. The primary outcome was the retear rate in MRI at 12-months follow-up. Secondary outcomes were: characteristics of the retear (at the footprint or at the musculotendinous junction) and clinical outcomes.

Results
Seventy-one subjects were randomized. Two were lost to follow-up, leaving 69 participants available for assessment at 12-months follow-up (33 in the Control group and 36 in the Nanofracture Group). The Nanofracture group had lower retear rates than the Control group (7/36 [19.4%] vs 14/33 [42.4%], differences significant, $p = 0.038$). Retear rates at the musculotendinous junction were similar but the Nanofracture group had better tendon healing rates to the bone (34/36 [94.4%] vs. 24/33 [66.71%], $p = 0.014$). Clinically both groups had significant improvements, but no differences were found between groups.

Conclusion
Adding nanofractures at the footprint during an isolated supraspinatus repair lowers in half the retear rate at 12-months follow-up. This is due to improved healing at the footprint.

Level of evidence
Level I.

BACK

Prediction of the anterior shoulder pain source by detecting indirect signs for partial articular subscapularis tendon tears through conventional magnetic resonance imaging.

Lee, J.H., Rhyou, I.H. & Ahn, K.B.

DOI: https://doi-org.eur.idm.oclc.org/10.1007/s00167-020-06259-z

Purpose
To evaluate the diagnostic efficacy of indirect signs for proximal articular-positioned, partial (< 50%), subscapularis tendon tears (facet 1 tears) via conventional magnetic resonance imaging (MRI).

Methods
A retrospective study was conducted on 67 patients of Yoo's type 1 or 2A tears. Forty-five arthroscopic subacromial decompression and acromioclavicular resection cases served as controls. Indirect signs indicating a facet 1 tear included small defects, superior subscapularis recess (SSR), long head of the biceps (LHBT) configurations, bone edema or cyst formation on lesser tuberosity (LTBEC), and fatty infiltration of subscapularis muscle. The sensitivity, specificity, positive predictive value (PPV), negative predictive value (NPV), and accuracy were checked.

Results
SSR was the most sensitive sign (90%). The sensitivities and NPV of LHBT configurations and LTBEC were low (sensitivity: 42.9% and 17.9%, NPV: 56.4% and 44.4%, respectively). The specificities of all indirect signs were relatively high (> 90%). The Chi-squared test and multinomial logistic regression confirmed the significance of small defects, SSRs, and fatty infiltrations for facet 1 tears ($p \leq 0.014$). The combined sensitivity and specificity were up to 97.7% and 92.3%, respectively, in the presence of either a small defect or an SSR.

Conclusions
Conventional MRI alone can detect facet 1 tears through indirect signs (small defects, SSR, and fatty infiltrations of the subscapularis muscle), predicting unspecified anterior shoulder pain due to concealed biceps instability, and facilitating preoperative diagnosis for a facet 1 tear.

Level of evidence
III.

BACK

Arthroscopic knotless repair: an effective technique for small-sized supraspinatus tendon tears.

Gaume, M., Pages, L., Bahman, M. et al.

DOI: https://doi-org.eur.idm.oclc.org/10.1007/s00167-020-06249-1

Purpose
The purpose was to evaluate the clinical and radiological results of knotless repair with flat-braided suture in full small-sized supraspinatus tendon tears (< 1 cm).

Methods
A consecutive series of 54 patients with isolated small supraspinatus tendon tear (< 1 cm and Goutallier index < 2) was evaluated in the study. Patients underwent a knotless arthroscopic repair using flat-braided suture (2 mm wide). Minimal follow-up required was 5 years. Changes in Murley–Constant score, ASES score, strength, and pain relief were assessed. The Sugaya score was used to confirm the tendon repair on MRI. Data were analyzed in two subgroups: technique with additional U point for dog ear deformity (group 1) and technique without additional U point (group 2). The immobilization period was 3 weeks long. Passive mobilization was immediate.

Results
Fifty-four patients were included. Mean age was 57 ± 4 years. The average follow-up was 68 ± 10 months. Average preoperative score of Constant was 51.2 ± 8.5 and 83.1 ± 14.6 at the end of the follow-up ($p < 0.001$). Mean VAS went from 5.8 ± 1.8 to 1.9 ± 2.1 ($p < 0.001$). Average forward elevation of the shoulder went from 86.3° ± 9 preoperatively to 169.6° ± 15.9 at the end of the follow-up ($p < 0.001$). The strength score was significantly higher post-operatively (18.4 vs. 8.3, $p < 0.001$.). The ASES score was significantly improved 49.1 ± 13.1 vs. 88.6 ± 15.8, $p < 0.001$). The MRI assessment revealed 94% of Sugaya 1–2. No significant difference was observed between group 1 and 2 regarding all clinical outcomes. Two complex regional pain syndromes were described with a favorable evolution. Three patients presented a retear requiring an iterative arthroscopic repair.

Conclusion
The use of a knotless arthroscopic construct with flat-braided suture for small supraspinatus repair achieved excellent structural and clinical results. This technique is fully adequate for the arthroscopic treatment of such tears, enabling early mobilization.

Level of evidence
Level III.

BACK

Treatment type may influence degree of post-dislocation shoulder osteoarthritis: a systematic review and meta-analysis.

Verweij, L.P.E., Pruijssen, E.C., Kerkhoffs, G.M.M.J. et al.

DOI: https://doi-org.eur.idm.oclc.org/10.1007/s00167-020-06263-3

Purpose
Age at primary dislocation, recurrence, and glenoid bone loss are associated with development of osteoarthritis (OA). However, an overview of OA following traumatic anterior shoulder instability is lacking and it is unclear to what degree type of surgery is associated with development of OA in comparison to non-operative treatment. The aim of this study was to determine the degree of OA at long-term follow-up after non-operative and operative treatments for patients with anterior shoulder instability. Surgery is indicated when patients experience recurrence and this is associated with OA; therefore, it was hypothesized that shoulders show a higher proportion or degree of OA following operative treatment compared to non-operative treatment.

Methods
A literature search was performed in the PubMed/Medline, EMBASE, and Cochrane databases. Articles reporting the degree of OA that was assessed with the Samilson–Prieto or Buscayret OA classification method after non-operative and operative treatment for anterior shoulder instability with a minimum of 5 years follow-up were included.

Results
Thirty-six articles met the eligibility criteria of which 1 reported the degree of OA for non-operative treatment and 35 reported the degree of OA for 9 different operative procedures. A total of 1832 patients (1854 shoulders) were included. OA proportions of non-operative and operative treatments are similar at any point of follow-up. The Latarjet procedure showed a lower degree of OA compared to non-operative treatment and the other operative procedures, except for the Bristow procedure and Rockwood capsular shift. The meta-analyses showed comparable development of OA over time among the treatment options. An increase in OA proportion was observed when comparing the injured to the contralateral shoulder. However, a difference between the operative subgroups was observed in neither analysis.

Conclusion
Non-operative and operative treatments show similar OA proportions at any point of follow-up. The hypothesis that shoulders showed a higher proportion or degree of OA following operative treatment compared to non-operative treatment is not supported by the data. Operative treatment according to the Latarjet procedure results in a lower degree of OA compared to other treatments, including non-operative treatment.

Level of evidence
IV.

BACK

No difference in 90-day complication rate following open versus arthroscopic Latarjet procedure.

Hurley, E.T., Manjunath, A.K., Matache, B.A. et al.

DOI: https://doi-org.eur.idm.oclc.org/10.1007/s00167-020-06301-0

Abstract
The purpose of this study was to compare the 90-day complication rate between the open and arthroscopic Latarjet procedure. A retrospective review of patients who underwent an open or arthroscopic Latarjet procedure at NYU Langone Health between 2012 and 2019 was performed. The complications, readmissions, and reoperations within 90 days were assessed. Outcomes were compared between the two approaches, and a p value of < 0.05 was considered to be statistically significant. The study included 150 patients (open: 110; arthroscopic: 40), with no patients lost to follow-up within the first 90 days. Both cohorts were similar in terms of patient demographics. No intra-operative complications were observed in either group. Overall, there were 4 post-operative complications with the open approach and 2 with the arthroscopic approach (3.6% and 5.0%, respectively; n.s.) during the study period. Three patients required a readmission within the 90-day period; one patient in both groups required a revision Latarjet for graft fracture, and one patient in the open Latarjet required irrigation and debridement for deep infection (n.s.). With the open approach, there were 2 (2.3%) wound complications, 1 graft complication, and 1 (1.1%) nerve injury. With the arthroscopic approach, there was 1 (2.8%) wound complication and 1 (2.8%) hardware complication. The safety, and 90-day complication and readmission profile of arthroscopic Latarjet is similar to open Latarjet procedure.

Level of evidence
Level III.

BACK

Arthroscopic remplissage with all-suture anchors causes cystic lesions in the humerus: a volumetric CT study of 55 anchors.

Ruiz Ibán, M.A., Vega Rodriguez, R., Ruiz Díaz, R. et al.

DOI: https://doi-org.eur.idm.oclc.org/10.1007/s00167-020-06314-9

Purpose
To evaluate with computed tomography (CT) the incidence of implant-related osteolysis after implantation of two types of all-suture anchors during remplissage for the management of Hill-Sachs lesions in shoulder instability.

Methods
Single-cohort, observational study with a minimum of 12 months follow-up. Twenty-five participants (19 males and 6 females; mean age 37.4 years [SD: 11.6]) with Hill-Sachs lesions requiring remplissage were evaluated with a CT performed a mean of 14.1 [3.74] months after surgery. Fifty-five all-suture anchors (19 2.3 mm Iconix and 36 1.7 mm Suturefix) were used. The volume of the bone defects was measured in the CT. Every anchor was classified into one of four groups: (1) no bone defect. (2) Partial bone defect (bone defects smaller than the drill used for anchor placement). (3) Tunnel enlargement (bone defect larger than the drill volume but smaller than twice that volume). (4) Cystic lesion (bone defect larger twice the drill volume).

Results
No bone defect was identified in only two anchors (3.6%, 95% CI 0.4–12.5%). A partial bone defect was found in eight anchors (14.5%, 95% CI 6.5–26.7%). In 35 anchors (63.6%, 95% CI 49.6–76.2%), there was enlargement of the bone defect that was smaller than 200% the size of the drill used. Ten anchors caused bone defects larger than twice the size of the drill used (18.2%, 95% CI 9.1–30.9%). The defect size was a mean of 89 mm3 (SD: 49 mm3, minimum 0 mm3, maximum 230 mm3).

Conclusion
When using all-suture anchors in arthroscopic remplissage during instability surgery, relevant bone osteolytic defects are common at 1-year-follow-up. Cystic defects larger than twice the volume of the resected bone during implantation develop in one in six anchors and significant tunnel widening will develop in another three out of five anchors. This bone loss effectively increases the size and depth of the Hill-Sachs lesions but does not seem to affect short-term clinical outcomes.

Level of evidence
Level IV.

BACK

Arthroscopic reduction and subscapularis remplissage (ARR) of chronic posterior locked shoulder dislocation leads to optimized outcomes and low rate of complications.

Romano, A.M., Edwards, T.B., Nastrucci, G. et al.

DOI: https://doi-org.eur.idm.oclc.org/10.1007/s00167-020-06317-6

Purpose
Unrecognized posterior shoulder dislocation with a concomitant humeral head fracture affects joint function and no consensus exists regarding treatment. The present study analyses clinical and radiographic outcomes of a novel arthroscopic technique for reducing chronic locked posterior shoulder dislocation associated with subscapularis remplissage.

Methods
The study comprises a retrospective analysis of consecutive chronic posterior locked shoulders (CPLS) with minimum 2-years follow-up of patients who had undergone McLaughlin technique arthroscopic modification for the treatment of CPLS with a reverse Hill–Sachs lesion. Active range of motion (ROM), Western Ontario (WOSI) and Constant Score (CS), were evaluated pre- and postoperatively. Plain radiographs and magnetic resonance imaging (MRI) scans were collected pre- and post-operatively, recording bone defect, osteoarthritis, cuff integrity/fatty infiltration, and the grade of filling of the reverse Hill-Sachs.

Results
Twelve male patients with a mean follow-up of 37.3 months ± 10.5 (range, 24–58) were included. Mean WOSI and CS scores improved from 41 to 92 and 28 to 94 points, respectively. ROM measurements all had significantly increased at final follow-up, with no significant differences in arm rotation. No defects were left unfilled at final MRI examination.

Conclusion
The results of this uncontrolled study with a limited number of patients confirm that arthroscopic reduction and subscapularis remplissage is a highly effective and satisfactory treatment method resulting in no shoulder rotation deficits.

Level of evidence
Level IV.

BACK

Repair of high-grade partial thickness supraspinatus tears after surgical completion of the tear have a lower retear rate when compared to full-thickness tear repair.

Hughes, J.D., Gibbs, C.M., Reddy, R.P. et al.

DOI: https://doi-org.eur.idm.oclc.org/10.1007/s00167-021-06524-9

Purpose
High-grade partial thickness rotator cuff tears (i.e., those involving at least 50% of the tendon thickness) are especially challenging to treat and various treatment strategies have been described. Prior studies have demonstrated equivalent outcomes between in situ tear fixation and tear completion repair techniques. However, it is unknown how repair of completed high-grade partial thickness tears to full tears compares to repair of full-thickness tears. The purpose of this study was to compare clinical outcome measures at least 1 year postoperatively between patients who had completion of a high-grade partial thickness supraspinatus tear to a full-thickness tear (PT) and those who had an isolated full-thickness supraspinatus tear (FT). The hypothesis of this study was equivalent retear rates as well as equivalent clinical and patient-reported outcomes between the two groups.

Methods
A retrospective review of 100 patients who underwent isolated arthroscopic supraspinatus repair between 2013 and 2018 with a minimum of 1 year follow-up was performed. Patients were separated into two groups based on their treatment: 56 had completion of a partial thickness supraspinatus tear to full-thickness tear with repair (PT) and 44 had isolated full-thickness supraspinatus repairs (FT). The primary outcome was rotator cuff retear, which was defined as a supraspinatus retear requiring revision repair. Secondary outcomes were patient-reported outcome measures (PROs) including visual analog pain scale (VAS) and subjective shoulder value (SSV), range of motion (ROM) and strength in forward flexion (FF), external rotation (ER), and internal rotation (IR).

Results
There was a significantly lower rate of retear between the PT versus FT groups (3.6% vs. 16.3%, $p = 0.040$). There were no significant differences between groups for all PROs, all ROM parameters, and all strength parameters (all n.s.).

Discussion
The data from this study demonstrated that the PT group had a significantly lower retear rate at 1 year follow-up than the FT group, while PROs, ROM, and strength were similar between the two groups. Patients with PT supraspinatus tears can have excellent outcomes, equivalent to FT tears, after completion of the tear, and subsequent repair with low retear rates. These findings may aid the treating surgeon when choosing between in situ fixation of the PT supraspinatus tear or completion of the tear and subsequent repair, as it allows the treating surgeon to choose the procedure based on comfort and experience level.

Level of evidence
Level III.

BACK

American Journal of Sports Medicine (AJSM), Volume 49, Issue 7

The Effect of Platelet-Rich Plasma Leukocyte Concentration on Arthroscopic Rotator Cuff Repair: A Network Meta-analysis of Randomized Controlled Trials

Eoghan T. Hurley, MB, BCh, MCh*, Christopher A. Colasanti, MD, Utkarsh Anil, MD, Tyler A. Luthringer, MD, Michael J. Alaia, MD, Kirk A. Campbell, MD, Laith M. Jazrawi, MD, Eric J. Strauss, MD

First Published December 17, 2020; pp. 2528–2535

https://doi.org/10.1177/0363546520975435

Background: It is unclear whether leukocyte-poor (LP) or leukocyte-rich (LR) varieties of platelet-rich plasma (PRP) as an adjuvant to arthroscopic rotator cuff repair (ARCR) result in improved tendon healing rates.

Purpose: To perform a network meta-analysis of the randomized controlled trials in the literature to ascertain whether there is evidence to support the use of LP- or LR-PRP as an adjunct to ARCR.

Methods: The literature search was based on the PRISMA (Preferred Reporting Items for Systematic Reviews and Meta-Analyses) guidelines. Randomized controlled trials comparing LP- or LR-PRP with a control alongside ARCR were included. Clinical outcomes, including retears and functional outcomes, were compared using a frequentist approach to network meta-analysis, with statistical analysis performed using R. The treatment options were ranked using the P-score.

Results: There were 13 studies (868 patients) included, with 9 studies comparing LP-PRP with a control and 4 studies comparing LR-PRP with a control. LP-PRP was found to significantly reduce the rate of retear and/or incomplete tendon healing after fixation, even among medium-large tears; it also improved outcomes on the visual analog scale for pain, Constant score, and University of California Los Angeles score. LP-PRP had the highest P-score for all treatment groups. LR-PRP did not result in any significant improvements over the control group, except for visual analog scale score for pain. However, post hoc analysis revealed that LP-PRP did not lead to significant improvements over LR-PRP in any category.

Conclusion: The current study demonstrates that LP-PRP reduces the rate of retear and/or incomplete tendon healing after ARCR and improves patient-reported outcomes as compared with a control. However, it is still unclear whether LP-PRP improves the tendon healing rate when compared with LR-PRP.

BACK

Outcomes of Arthroscopic Nerve Release in Patients Treated for Large or Massive Rotator Cuff Tears and Associated Suprascapular Neuropathy: A Prospective, Randomized, Double-Blinded Clinical Trial

Nikolaos Platon Sachinis, MD, PhD*, Sotirios Papagiannopoulos, MD, PhD, Ioannis Sarris, MD, PhD, Pericles Papadopoulos, MD, PhD

First Published June 22, 2021; pp. 2301–2308

https://doi.org/10.1177/03635465211021834

Background: Suprascapular neuropathy has been observed in the setting of rotator cuff tears (RCTs), but its association with these tears and their treatment are unclear.

Hypothesis: Arthroscopic suprascapular nerve release during rotator cuff repair will not alter the outcomes of neuropathy.

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

Methods: A total of 42 patients with large/massive reparable RCTs and suprascapular neuropathy were recruited and followed up at 6 and 12 months. Electrophysiological results as well as Disabilities of the Arm, Shoulder and Hand (DASH), American Shoulder and Elbow Surgeons (ASES), and Constant scores were evaluated at selected time periods. Patients were randomly assigned to 2 groups. Patients in the control group underwent arthroscopic repair of the rotator cuff without combined arthroscopic release of the superior transverse scapular ligament; in the second group, the superior transverse ligament was released. The primary outcome was to examine full suprascapular nerve recovery through electrophysiological changes between groups. The secondary/tertiary outcomes were analysis of clinical outcomes and assessment of the relation between RCT size and the degree of suprascapular nerve recovery. Patients, clinical staff members, and the neurologist were blinded to the type of surgical procedure.

Results: Of 42 patients, 37 completed the follow-up at 12 months (median age, 64 years [range, 50-75 years]). Overall, 17 of 19 (89.5%) patients in the control group and 15 of 18 (83.3%) patients in the nerve release group had full nerve recovery, with no significant difference between the 2 groups. Clinically, all patients in both groups showed a significant improvement ($P < .001$), but no significant difference was observed between the 2 groups in terms of 12-month postoperative scores (control group: DASH: median, 5 [range, 0-21]; ASES: median, 88 [range, 83-98]; Constant: median, 86 [range, 70-98]) (nerve release group: DASH: median, 6 [range, 0-25]; ASES: median, 90 [range, 83-98]; Constant: median, 88 [range, 75-98]). Also, no significant difference was found between the 2 groups regarding other secondary and tertiary outcomes.

Conclusion: Combined arthroscopic release of the superior transverse scapular ligament and rotator cuff repair in patients with large/massive RCTs and suprascapular neuropathy did not produce statistically significant improved outcomes compared with repair of the rotator cuff alone.

BACK

Clinical Orthopaedics and Related Research, Volume 479, Issue 7

Does Biceps Tenotomy or Tenodesis Have Better Results After Surgery? A Systematic Review and Meta-analysis

Pozzetti Daou, Julia MD1; Nagaya, Dan Yuta MD1; Matsunaga, Fabio Teruo MD, PhD1; Sugawara Tamaoki, Marcel Jun MD, PhD1

doi: 10.1097/CORR.0000000000001672

Background
Although tenotomy and tenodesis are frequently used for long head of the biceps tendon lesions, controversies remain as to which technique is superior regarding pain, functionality, complications, and cosmetic appearance.

Questions/purposes:
(1) For long head of biceps tendon lesions, does tenotomy or tenodesis result in greater improvements in VAS score for pain? (2) Which approach has superior results when evaluating function outcome (Constant) scores? (3) Does tenotomy or tenodesis have fewer complications? (4) Does tenotomy or tenodesis result in better cosmesis (Popeye sign)?

Methods
A systematic review was performed in the Cochrane Library, Embase, PubMed, and Literatura Latino Americana e do Caribe em Ciências da Saúde (LILACS) using the keywords “long head of the biceps tendon,” “biceps tenodesis,” and “tenotomy.” We completed the search in June 2020. The inclusion criteria were randomized controlled trials and quasirandomized controlled trials that investigated tenodesis and tenotomy with no language restriction and evaluation of adult patients who presented with a long head of the biceps tendon lesion, associated with other lesions or not, without previous shoulder surgeries and who had no response to nonoperative treatment. The initial search yielded 239 studies, 40 of which were duplicates. We assessed the titles and abstracts of 199 articles and excluded all studies that were not randomized controlled trials (literature reviews) or that compared different techniques. We assessed the full text of 14 articles and excluded the ones that were protocols and cohort studies. We evaluated the risk of bias using the Cochrane Collaboration tool. We included eight studies in this systematic review and meta-analysis, with a total of 615 participants, 306 of whom were treated with tenotomy and 309 with tenodesis. The median duration of follow-up was 2 years. Overall, the included studies had a low risk of bias. The complications evaluated were adhesive capsulitis, biceps brachii tear, cramps, and a subsequent second surgical procedure. We used a random model in this meta-analysis so that we could generalize the results beyond the included studies. In this study, we only reported differences between the groups if they were both statistically valid and larger than the minimum clinically important difference (MCID).

Results
Comparing tenotomy and tenodesis, we observed no difference between the groups regarding pain in the long term (mean difference 0.25 [95% confidence interval -0.29 to 0.80]; p = 0.36). There was no difference in Constant score in the long-term (mean difference -1.45 [95% CI -2.96 to 0.06]; p = 0.06). There were no differences when evaluating for major complications (odds ratio 1.37 [95% CI 0.29 to 6.56]; p = 0.70). There were not enough papers evaluating adhesive

BACK

capsulitis, cramping, and risk of revision surgery. Popeye sign was more frequent in the tenotomy group than in the tenodesis group (OR 4.70 [95% CI 2.71 to 8.17]; $p < 0.001$).

Conclusion
This systematic review demonstrated that tenotomy and tenodesis offer satisfactory treatment for long head of the biceps tendon lesions. In terms of pain improvement and Constant score, there was no difference between the techniques, but patients undergoing tenotomy have worse cosmetic results. Therefore, surgeons should choose the technique based on their skills and the patient's expectations of surgery, such as cosmesis and time to recovery. More studies are needed to evaluate complications such as adhesive capsulitis and cramping, as well as to compare duration of surgery and recovery time for each technique.

Level of Evidence
Level I, therapeutic study.

BACK

Lower Extremity

Arthroscopy, Volume 37, Issue 7

Concomitant Lumbar Spinal Stenosis Negatively Affects Outcomes After Hip Arthroscopy for Femoroacetabular Impingement

Berkcan Akpinar, Lawrence J. Lin, David A. Bloom, Thomas Youm

https://doi.org/10.1016/j.arthro.2021.01.068

Purpose
The purpose of this study was to assess the prognostic effect of lumbar spinal stenosis on clinical outcomes after hip arthroscopy for femoroacetabular impingement syndrome (FAI).

Methods
Patients undergoing hip arthroscopy between September 2009 and December 2015 for FAI with concomitant lumbar spinal stenosis (central/neuroforaminal) and a 2-year follow-up were identified (hip-spine). A 1:1 case-matching query using preoperative modified Harris Hip Score (mHHS) within 3 points, body mass index (BMI) within 3 points, age within 5 years, and sex identified a control cohort without spinal pathology. Follow-up patient-reported outcomes (PROs) and clinical failure rates to revision procedure were compared using analysis of variance (ANOVA) and Kaplan-Meier survival analysis.

Results
Twenty-six patients met criteria of the hip-spine group (age: 45.9 ± 12.2 years; BMI: 27.3 ± 5.0 kg/m2, baseline mHHS: 44.17 ± 2.76) vs the control group (age: 46.2 ± 12.4 years, P = .94; BMI: 26.7 ± 4.1 kg/m2, P = .61; baseline mHHS: 44.27 ± 2.82, P = .98). ANOVA analysis demonstrated that all PROs improved from baseline to 2-year outcomes (P < .001). The hip-spine vs control group had lower 1-year (mHHS: 65.97 ± 5.64 vs 85.04 ± 3.09, P = .006; nonarthritic hip score (NAHS): 70.26 ± 5.71 vs 87.89 ± 2.65, P = .010) and 2-year (mHHS: 69.72 ± 4.92 vs 84.71 ± 2.56, P = .007; NAHS: 72.23 ± 5.18 vs 87.14 ± 2.23, P = .008) outcomes. While there was no difference in patient acceptable symptomatic state (PASS) and minimal clinically important difference (MCID) rates at 1-year follow-up, the hip-spine group demonstrated lower PASS (42% vs 81%, P = .004) and MCID (58% vs 88%, P = .027) rates at 2 years. Although susceptible to type II error, there was no difference in clinical failure rates to revision procedure (P = .13).

Conclusions
While net PROs from baseline improve after hip arthroscopy for FAI, the presence of concomitant lumbar spinal stenosis negatively affects postoperative PROs. FAI patients with spinal stenosis should be counseled accordingly.

Level of Evidence
Level III, case-control study.

BACK

Tenotomy for Iliopsoas Pathology is Infrequently Performed and Associated with Poorer Outcomes in Hips Undergoing Arthroscopy for Femoroacetabular Impingement

Matsuda, Dean & Kivlan, Benjamin & Nho, Shane & Wolff, Andrew & Salvo, John & Christoforetti, John & Ellis, Thomas & Carreira, Dominic

https://doi.org/10.1016/j.arthro.2021.02.018

Purpose
The purpose of this article was to report prevalence of iliopsoas pathology in patients undergoing hip arthroscopy for femoroacetabular impingement (FAI), incidence of rendered tenotomy, and outcomes of hips with iliopsoas involvement compared with those with primary FAI.

Methods
A cohort study from a hip arthroscopy study group using a prospectively-collected multicenter database was performed. Patients who underwent isolated hip arthroscopy for FAI from January 2016 to March 2017 were assigned to the Iliopsoas group (defined as preoperative diagnosis of coxa saltans internus, intraoperative anteroinferior labral bruising or tear, and preoperative positive psoas injection) or control group. The prevalence of iliopsoas pathology, radiographic and intraoperative findings, and rendered procedures between groups were compared. Mean 2-year (minimum 1.8 year) outcomes of iliopsoas groups with and without rendered tenotomy and a control group were compared.

Results
There were 1393 subjects, of which 92 (7%) comprised the iliopsoas study group with 1301 subjects control subjects. Sixteen subjects in the iliopsoas group received tenotomy (17% of iliopsoas group, 1% of all subjects), whereas 76 subjects (83% of iliopsoas group) with iliopsoas involvement did not. There was significant effect on postoperative International Hip Outcome Tool-12 (iHOT-12) scores based on iliopsoas involvement and treatment, $F(2,1390) = 3.74$, $P = .02$. Compared with the control group ($M = 73$, standard deviation [SD] = 24), the non-tenotomized iliopsoas group ($M = 69$, $SD = 32$) had similar postoperative scores ($P = .46$), whereas the tenotomized iliopsoas group ($M = 57$, $SD = 28$) averaged lower postoperative scores ($P = .03$). In the tenotomy group, 25% achieved the iHOT-12 substantial clinical benefit and patient acceptable symptomatic state value for normal function and 100% satisfaction, compared to 49% and 41% for the without tenotomy and control groups.

Conclusions
Tenotomy in patients with iliopsoas pathology undergoing arthroscopic surgery for FAI is infrequently performed and is associated with poorer outcomes. Co-afflicted patients treated without tenotomy have similar successful outcomes to patients with primary FAI. Indiscriminate tenotomy for iliopsoas pathology in this setting should be cautiously considered.

Level of Evidence
Level III, cohort study.

BACK

Joint Venting Prior to Hip Distraction Minimizes Traction Forces During Hip Arthroscopy

Dillon C. O'Neill, Alexander J. Mortensen, Kelly M. Tomasevich, Suzanna M. Ohlsen, Temitope F. Adeyemi, Travis G. Maak, Stephen K. Aoki

https://doi.org/10.1016/j.arthro.2021.02.015

Purpose
This study evaluates the effect of venting on distraction of the hip during arthroscopy on a post-free traction table for fixed traction forces ranging from 0 to 100 pounds (lbs).

Methods
Patients underwent surgery by the senior author (S.K.A.) between November 2018 and July 2019. Inclusion criteria were primary hip arthroscopy requiring central compartment access. Patients were positioned in 10-15° Trendelenburg on a post-free traction table. Prior to instrumentation, fluoroscopic images of the operated hip joint were taken at 25-lb intervals from 0 to 100 lbs of axial traction. Traction was released for 15 minutes. Venting with 20 mL of air was performed and fluoroscopic images were repeated at all traction intervals. Joint displacement was measured at all intervals. An unvented control group underwent the same axial traction protocol for comparison.

Results
Sixty-one consecutive patients underwent study protocol. Fifty-eight hips in 57 patients were included. Thirty-two (55.2%) were female; mean age was 31 ± 13 years and mean body mass index was 25.7 ± 6.2. Paired samples analysis demonstrated mean differences in distraction distance prior to and after venting of 0.27, 2.60, 4.09, 4.54, and 2.31 mm at 0, 25, 50, 75, and 100 lbs of traction, which were significant ($P < .001$) at all traction intervals. Significantly more vented hips distracted at least 10 mm at 25-100 lbs traction ($P \leq .001$). An unvented control group showed no significant differences between the first and second traction application.

Conclusions
Venting prior to applying traction on a post-free traction table increases the distraction distance achieved for a given traction force at multiple levels of traction in comparison to the pre-vented state. Our results suggest venting the hip joint prior to the application of traction may serve to reduce the maximal amount of traction required to safely instrument the hip arthroscopically.

Level of Evidence
IV, case series.

BACK

Multimodal Nonopioid Pain Protocol Provides Equivalent Pain Versus Opioid Control Following Meniscus Surgery: A Prospective Randomized Controlled Trial

Toufic R. Jildeh, Kelechi R. Okoroha, Noah Kuhlmann, Austin Cross, Muhammad J. Abbas, Vasilios Moutzouros

https://doi.org/10.1016/j.arthro.2021.02.043

Purpose
To assess the effectiveness of a nonopioid pain regimen in controlling postoperative pain as compared with a traditional opioid pain control following primary meniscectomy or meniscal repair.

Methods
Ninety-nine patients undergoing primary meniscectomy or meniscal repair were assessed for participation. A prospective randomized control trial was performed in accordance with the Consolidated Standards of Reporting Trials 2010 statement. The 2 arms of the study included a multimodal nonopioid analgesic protocol and a standard opioid regimen with a primary outcome of postoperative pain level (visual analog scale) for the first 10 days postoperatively. Secondary outcomes included patient-reported outcomes, complications, and patient satisfaction. Randomization was achieved using a random-number generator. Patients were not blinded. Data collection was done by a blinded observer.

Results
Eleven patients did not meet the inclusion criteria, and 27 declined participation. A total of 61 patients were analyzed with 30 randomized to the opioid regimen and 31 randomized to the nonopioid regimen. Patients receiving the nonopioid regimen demonstrated noninferior visual analog scale scores compared with patients who received opioid pain medication ($P > .05$). No significant differences were found in preoperative (opioid: 58.9 ± 7.0; nonopioid: 58.2 ± 5.5, $P = .724$) or postoperative (opioid: 59.8 ± 6.5; nonopioid: 54.9 ± 7.1, $P = .064$) Patient-Reported Outcomes Measurement and Information System Pain Interference Short Form scores. No difference was found in recorded side effects between both groups at any given time point: constipation, nausea, diarrhea, upset stomach, and drowsiness ($P > .05$).

Conclusions
This study found that a multimodal nonopioid pain protocol provided equivalent pain control and patient outcomes following primary meniscus surgery while having an equivalent side effect profile. All patients reported satisfaction with their pain management without requiring emergency opioid analgesia.

Level of Evidence
Level I, prospective randomized controlled trial.

BACK

Use of Extracellular Matrix Cartilage Allograft May Improve Infill of the Defects in Bone Marrow Stimulation for Osteochondral Lesions of the Talus

Clanton, Thomas & Johnson, Nicholas & Matheny, Lauren

https://doi.org/10.1016/j.arthro.2021.03.032

Purpose
To evaluate the effectiveness of extracellular matrix cartilage allograft (EMCA) as an adjuvant to bone marrow stimulation (BMS) compared with BMS alone in the treatment of osteochondral lesions of the talus.

Methods
A retrospective cohort study comparing patients treated with BMS with EMCA (BMS-EMCA group) and BMS alone (BMS group) between 2013 and 2019 was undertaken. Clinical outcomes were evaluated with the Foot and Ankle Outcome Score (FAOS) preoperatively and postoperatively. Postoperative magnetic resonance imaging (MRI) scans were evaluated using the modified Magnetic Resonance Observation of Cartilage Repair Tissue score. Comparisons between groups were made with the Mann-Whitney U test for continuous variables and the Fisher exact test for categorical variables.

Results
Twenty-four patients underwent BMS with EMCA (BMS-EMCA group), and 24 patients underwent BMS alone (BMS group). The mean age was 40.8 years (range, 19-60 years) in the BMS-EMCA group and 47.8 years (range, 24-60 years) in the BMS group (P = .060). The mean follow-up time was 20.0 months (range, 12-36 months) in the BMS-EMCA group and 26.9 months (range, 12-55 months) in the BMS group (P = .031). Both groups showed significant improvements in all FAOS subscales. No significant differences between groups were found in all postoperative FAOS values. The mean Magnetic Resonance Observation of Cartilage Repair Tissue score in the BMS-EMCA group was higher (76.3 vs 66.3) but not statistically significant (P = .176). The MRI analysis showed that 87.5% of the BMS-EMCA patients had complete infill of the defect with repair tissue; however, fewer than half of the BMS patients (46.5%) had complete infill (P = .015). Conclusions: BMS with EMCA is an effective treatment strategy for osteochondral lesions of the talus and provides better cartilage infill in the defect on MRI. However, this did not translate to improved functional outcomes compared with BMS alone in the short term. Additionally, according to analysis of the minimal clinically important difference, there was no significant difference in clinical function scoring between the 2 groups postoperatively.

Level of Evidence
Level III, retrospective comparative study.

BACK

Return-to-Sport Rate and Activity Level Are High Following Arthroscopic All-Inside Meniscal Repair With and Without Concomitant Anterior Cruciate Ligament Reconstruction: A Systematic Review

Blanchard, Erica & Hadley, Christopher & Wicks, Eric & Emper, William & Cohen, Steven

https://doi.org/10.1016/j.arthro.2021.02.046

Purpose
To systematically review the literature of return-to-sport outcomes following all-inside meniscus repair and evaluate whether concomitant anterior cruciate ligament reconstruction (ACLR) influenced these outcomes.

Methods
A systematic review of the MEDLINE, PubMed, Embase, and Cochrane Registry of Systematic Reviews databases was performed according to Preferred Reporting Items for Systematic Reviews and Meta-Analyses guidelines. Two reviewers examined all literature pertaining to sport outcomes following all-inside meniscal repair. Studies were included if they had a 12-month minimum follow-up and reported return to sport rate, Tegner, or Knee injury and Osteoarthritis Outcome Score (KOOS) Sport outcomes. Studies with meniscal repair techniques other than the all-inside technique were excluded. Studies were not excluded if they contained patients receiving concomitant ACLR. Study quality was evaluated with the Methodological Index for Nonrandomized Studies.

Results
Nineteen studies comprising 872 patients were included in this investigation. The weighted average patient age was 28.7 (range 14.1-42.1) years, and the weighted average follow-up was 56.0 (range 18.0-155.0) months. The mean Methodological Index for Nonrandomized Studies score was 14.4 ± 3.7. Ten investigations reported both preoperative (range 2.3-3.5) and postoperative (range 4.0-7.3) Tegner outcomes, with scores at final follow-up greater in each of the 10 reporting investigations. KOOS Sport outcomes were examined in 5 investigations, with scores at follow-up ranging from 63.6 to 91. Three studies reported a return to sport rate ranging from 89.6 to 90% at follow-up. Four investigations compared sport-related outcomes between isolated meniscal repair and meniscal repair with concomitant ACLR. Two such studies reported no difference between the 2 cohorts, 1 favored the isolated cohort, and 1 favored the combined cohort.

Conclusions
This systematic review found a 90% return-to-sport rate and high postoperative activity level following all-inside meniscal repair, as assessed by KOOS Sport and Tegner activity scales. Further, concurrent ACLR did not significantly affect these outcomes.

Level of Evidence
IV, systematic review of level I-IV studies.

BACK

Bone Grafting the Patellar Defect After Bone–Patellar Tendon–Bone Anterior Cruciate Ligament Reconstruction Decreases Anterior Knee Morbidity: A Systematic Review

Darius L. Lameire, Hassaan Abdel Khalik, Alexander Zakharia, Jeffrey Kay, Mahmoud Almasri, Darren de SA

https://doi.org/10.1016/j.arthro.2021.03.031

Purpose
The aim of this systematic review was to evaluate the impact of bone grafting of patellar defects on reported anterior knee morbidity and subjective outcomes after bone–patellar tendon–bone autograft reconstruction of the anterior cruciate ligament.

Methods
A systematic electronic search of MEDLINE, Embase, Web of Science, and the Cochrane Library was carried out. All English-language prospective randomized clinical trials published from January 1, 2000, to July 24, 2020, were eligible for inclusion. All studies addressing patellar defect grafting were eligible for inclusion regardless of the timing of surgery, graft type, surgical technique, or rehabilitation protocol.

Results
A total of 39 studies with 1,955 patients were included for analysis. There were 796 patients in the no patellar grafting (NPG) group, with a mean age range of 22.7 to 33.0 years, and 1,159 patients in the patellar grafting (PG) group, with a mean age range of 17.8 to 34.7 years. The visual analog scale pain score ranged from 1.2 to 5.1 in the NPG group compared with 0.3 to 3.7 in the PG group. The proportion of patients with anterior knee pain ranged from 19% to 81% in the NPG group and from 15% to 32% in the PG group. Moderate to severe kneeling pain was reported in 22% to 57% of patients in the NPG group and 10% of those in the PG group. The percentage of patients with at least 3° of extension loss ranged from 4% to 43% in the NPG group and from 2% to 11% in the PG group.

Conclusions
PG favors decreased anterior knee pain, kneeling pain, and extension loss compared with non-grafted defects; however, the functional outcomes are comparable. Owing to the heterogeneity in reporting, statistical conclusions could not be drawn.

Level of Evidence
Level II, systematic review of Level I and II studies.

BACK

American Journal of Sports Medicine (AJSM), Volume 49, Issue 7

Increased Posterior Tibial Slope Is Associated With Greater Risk of Graft Roof Impingement After Anatomic Anterior Cruciate Ligament Reconstruction

Guan-yang Song, MD, Qian-kun Ni, MD, Tong Zheng, MD, Hua Feng, MD, Zhi-jun Zhang, MD, Hui Zhang, MD†

First Published June 23, 2021; pp. 2396–2405

https://doi.org/10.1177/03635465211018859

Background: Increased posterior tibial slope (PTS) has been reported to be associated with irreducible anterior tibial subluxation in extension after anatomic anterior cruciate ligament (ACL) reconstruction (ACLR), which raises concerns about the greater risk of graft roof impingement (GRI) although the tibial tunnel is positioned anatomically.

Hypothesis: Increased PTS would be associated with greater risk of GRI after anatomic ACLR.

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

Methods: Between January 2016 and December 2017, a total of 418 consecutive patients were diagnosed as having noncontact ACL injuries and underwent primary anatomic ACLR. Among them, 26 patients had ≥1 of the following features during the second-look arthroscopy: fractured/guillotined bundles at the tibial insertion or cyclops lesion. These patients were confirmed to have GRI and were allocated to the study group. They were also matched 1:2 to 52 control participants without GRI. PTS was measured on true lateral whole-leg radiographs. Intra-articular ACL graft signal intensity was evaluated on postoperative magnetic resonance imaging scans (mean, 32.8 months; range, 26-38 months) and divided into 3 grades (I, good; II, moderate; III, poor) based on degree of GRI. Moreover, anterior subluxation of the lateral compartment (ASLC) and medial compartment (ASMC) in extension relative to the femoral condyles were measured on postoperative magnetic resonance imaging scans and compared between the groups. In addition, predictors of GRI were evaluated using multivariate logistic regression analysis and included body mass index, PTS, pivot-shift test, KT-1000 side-to-side difference, and concomitant meniscal tears.

Results: PTS in the study group was significantly higher than that in control group (mean ± SD, 13.8°± 1.5° vs 9.5°± 1.8°; $P < .05$). In the study group (n = 26), patients with grade III (poor) graft signal intensity (n = 9) showed significantly higher PTS than those with grade II (moderate; n = 17) (16.4°± 1.7° vs 12.4°± 1.3°; $P < .05$). Moreover, the mean postoperative ASLC and ASMC in extension were significantly larger in the study group than the control group (ASLC, 4.1 ± 1.3 vs 0.8 ± 0.4 mm; ASMC, 4.3 ± 1.5 vs 0.9 ± 0.3 mm; $P < .05$). Furthermore, the abnormal degree of PTS (≥12°) was determined to be an independent risk factor associated with GRI after anatomic ACLR (odds ratio, 9.0 [95% CI, 3.7-30.2]; $P < .001$), whereas body mass index, grade of pivot-shift test, KT-1000 side-to-side difference, and concomitant meniscal tears were not.

Conclusion: Increased PTS (≥12°) was associated with greater risk of GRI after anatomic ACLR. This may provide additional information for counseling patients with greater risk of GRI.

BACK

Timing of Anterior Cruciate Ligament Reconstruction and Relationship With Meniscal Tears: A Systematic Review and Meta-analysis

Apostolos D. Prodromidis, MD, MSc*, Chrysoula Drosatou, BSc, MSc, PhD, Georgios C. Thivaios, MD, PhD, Nasri Zreik, BSc, MBChB, MSc, Charalambos P. Charalambous, BSc, MBChB, MSc, MD

First Published November 9, 2020; pp. 2551–2562

https://doi.org/10.1177/0363546520964486

Background: Anterior cruciate ligament (ACL) ruptures are common, but the ideal timing for ACL reconstruction after injury is unclear with regard to meniscal insult.

Purpose: To determine whether there is a relationship between timing from ACL rupture to ACL reconstruction and development of meniscal tears within this period.

Study Design: Systematic review and meta-analysis.

Methods: A systematic literature search was undertaken independently by 2 reviewers using the Cochrane method for systematic reviews in 5 online databases. The reviewers performed independent data extraction and assessment of risk of bias and study quality. The search included any comparative study, including randomized controlled trials (RCTs), prospective and retrospective cohort studies, and case-control studies of an adult population, that assessed the relationship between timing of ACL reconstruction surgery and rates of meniscal tears.

Results: After screening, 12 studies (No. of participants = 3042) out of 3390 records were included for analysis: 3 RCTs (n = 272), 2 prospective cohort studies (n = 307), and 7 retrospective cohort studies (n = 2463). In analysis of these studies, rates of reported meniscal tears were compared for ACL procedures performed at 3 and 6 months after injury. Meta-analysis of 5 studies (n = 2012) showed that ACL reconstruction performed >3 months after injury was associated with a higher rate of medial meniscal tears compared with ACL reconstruction performed within 3 months of injury (estimated OR, 2.235; 95% CI, 1.183-4.223; P = .013) but not with a higher rate of lateral meniscal tears. Similarly, meta-analysis of 4 studies (n = 990) showed that ACL reconstruction performed >6 months after injury was associated with a higher rate of medial meniscal tears compared with ACL reconstruction performed within 6 months of injury (estimated OR, 2.487; 95% CI, 1.241-4.984; P = .01) but not with a higher rate of lateral meniscal tears.

Conclusion: Our results suggest that delay of ACL reconstruction surgery >3 months after injury is associated with a higher rate of medial meniscal tears within this prereconstruction time frame. Further high-quality prospective studies may help determine whether this is a causal effect. However, based on current evidence, in those patients for whom ACL reconstruction is indicated, ACL reconstruction within 3 months of injury may be recommended.

BACK

Training Surgeons to Perform Arthroscopic All-Inside Meniscal Repair: A Randomized Controlled Trial Evaluating the Effectiveness of a Novel Cognitive Task Analysis Teaching Tool, Imperial College London/University College London Meniscus Repair Cognitive Task Analysis (IUMeRCTA)

Urvi Karamchandani, BSc, Rahul Bhattacharyya, MB ChB, MD, MSc, Rahul Patel, MD, Sam Oussedik, MBBS, BSc, Rajarshi Bhattacharya, MBBS, MSc, Chinmay Gupte, PhD, MA, BM BCh

First Published June 24, 2021; pp. 2341–2350

https://doi.org/10.1177/03635465211021652

Background: All-inside meniscal repair is an increasingly common technique for the surgical treatment of meniscal tears. There are currently no standardized techniques for training residents in this procedure. Cognitive task analysis (CTA) is a method of analyzing and standardizing key steps in a procedure that allows training to be conducted in a validated and reproducible manner.

Purpose: (1) To design a digital CTA teaching tool for a standardized all-inside meniscal repair. (2) To evaluate whether CTA-trained residents would perform better in a meniscal repair task compared with a control group who underwent traditional apprenticeship methods of training.

Study Design: Controlled laboratory study.

Methods: Three expert knee surgeons were interviewed using a modified Delphi method to generate a consensus among the ideal technical steps, cognitive decision points, and common errors and solutions for an all-inside meniscal repair. This written information was then combined with visual and audio components and integrated onto a digital platform to create the Imperial College London/University College London Meniscus Repair Cognitive Task Analysis (IUMeRCTA) tool. Eighteen novice residents were randomized into an intervention group (digital CTA tool) and control group (equipment instruction manual). Both groups performed an all-inside meniscal repair on high-fidelity, phantom knee models and were assessed by expert surgeons, blinded to the interventions, using a validated global rating scale (GRS). After a power calculation, median GRS scores were compared between groups using the Mann-Whitney U test; significance was set at $P < .05$.

Results: For the IUMeRCTA tool design, the procedure was divided into 55 steps across 9 phases: (1) preoperative planning, (2) theater and patient setup, (3) portal placement, (4) meniscal examination, (5) tear reduction, (6) suture planning, (7) suture insertion, (8) repair completion, and (9) postoperative care and rehabilitation. For the trial, the intervention group (mean ± SD GRS, 32 ± 2.9) performed significantly better than did the control group (GRS, 24 ± 3.3; $P < .001$).

Conclusion: This is the first CTA tool to demonstrate objective benefits in training novices to perform an arthroscopic all-inside meniscal repair.

Clinical Relevance: The IUMeRCTA tool is an easily accessible and effective adjunct to traditional teaching that enhances learning the all-inside meniscal repair for novice surgeons.

BACK

Achieving Successful Outcomes in High-Level Athletes With Borderline Hip Dysplasia Undergoing Hip Arthroscopy With Capsular Plication and Labral Preservation: A Propensity-Matched Controlled Study

Andrew E. Jimenez, MD, Peter F. Monahan, BS, Kara B. Miecznikowski, BS, Benjamin R. Saks, MD, Hari K. Ankem, MD, Payam W. Sabetian, MD, Ajay C. Lall, MD, MS, Benjamin G. Domb, MD§

First Published June 22, 2021; pp. 2447–2456

https://doi.org/10.1177/03635465211021001

Background: Return to sports (RTS) rates and patient-reported outcomes (PROs) after hip arthroscopy in athletes with borderline dysplasia (BD) have not been established.

Purpose: (1) To report minimum 2-year PROs and RTS rates in high-level athletes with BD who underwent hip arthroscopy for labral pathology in the setting of microinstability and (2) to compare clinical results with those of a matched control group of athletes with normal acetabular coverage.

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

Methods: Data were reviewed for surgery performed between January 2012 and July 2018. Patients were considered eligible if they received a primary hip arthroscopy in the setting of BD (lateral center-edge angle, 18°-25°) and competed in professional, collegiate, or high school sports. Inclusion criteria included preoperative and minimum 2-year follow-up scores for the modified Harris Hip Score, Non-arthritic Hip Score, Hip Outcome Score–Sport Specific Subscale, and visual analog scale for pain. Athletes with BD were matched to a control group of athletes with normal acetabular coverage (lateral center-edge angle, 25°-40°).

Results: A total of 65 patients with BD were included in the study with a mean ± standard deviation follow-up of 47.5 ± 20.4 months. Athletes with BD showed significant improvement in all outcome measures recorded, demonstrated high RTS rates (80.7%), and achieved the minimal clinically important difference (MCID) and Patient Acceptable Symptom State (PASS) for the Hip Outcome Score–Sport Specific Subscale at high rates (MCID, 90.8%; PASS, 75.4%). When compared with a propensity-matched control group with normal acetabular coverage, capsular plication was performed more commonly in the BD group (93.8% vs 82.7%; P = .037). PROs and RTS, PASS, and MCID rates were similar between the BD and control groups (P > .05).

Conclusion: High-level athletes with BD who undergo primary hip arthroscopy for labral pathology in the setting of microinstability may expect favorable PROs and RTS rates at minimum 2-year follow-up. These results were comparable with those of a control group of athletes with normal coverage.

BACK

Defining Clinically Significant Improvement on the Patient-Reported Outcomes Measurement Information System Test at 1-Year Follow-up for Patients Undergoing Hip Arthroscopy for the Treatment of Femoroacetabular Impingement Syndrome

Blake M. Bodendorfer, MD, Steven F. DeFroda, MD, MEng, Ian M. Clapp, MD, MS†, Alexander Newhouse, BS, Benedict U. Nwachukwu, MD, MBA, Shane J. Nho, MD, MS

First Published June 7, 2021; pp. 2457–2465

https://doi.org/10.1177/03635465211015687

Background: Although minimal clinically important difference (MCID), Patient Acceptable Symptom State (PASS), and substantial clinical benefit (SCB) have been defined for hip-specific legacy patient-reported outcome measures, these metrics have not been defined for the Patient-Reported Outcomes Measurement Information System (PROMIS) instruments for patients undergoing hip arthroscopy.

Purpose: To define the MCID, PASS, and SCB thresholds for the PROMIS Physical Function (PF) computerized adaptive test (CAT) and PROMIS Pain Interference (PI) instruments in patients undergoing hip arthroscopy for femoroacetabular impingement syndrome (FAIS).

Study Design: Cohort study (Diagnosis); Level of evidence, 2.

Methods: Patients undergoing primary hip arthroscopy between August 2018 and January 2019 for the treatment of FAIS were retrospectively analyzed. Patients were administered the PROMIS-PF, PROMIS-PI, Hip Outcome Score (HOS)–Activities of Daily Living, HOS–Sports Subscale, modified Harris Hip Score, and International Hip Outcome Tool–12 preoperatively and at 1 year postoperatively. MCID was calculated using the distribution method, whereas PASS and SCB were calculated using an anchor-based method. Patients achieving clinically significant outcomes (CSOs) were compared with those who did not achieve CSOs via chi-square and independent-samples t tests, and a multivariate logistic regression was conducted to determine predictors of CSO achievement.

Results: 124 patients with a mean age of 32.7 ± 12.3 years were included in the analysis. The threshold scores required to achieve MCID, PASS, and SCB, respectively, were as follows: PROMIS-PI (–3.1, 53.7, 51.9) and PROMIS-PF (3.3, 47.0, 49.9). Patients achieved any MCID, PASS, and SCB for PROMIS scores at a rate of 89.0%, 71.8%, and 62.1%, respectively, compared with 87.1%, 76.6%, and 71.8% for legacy patient-reported outcome measurements. For PROMIS-PF, higher preoperative PROMIS-PF score was a positive predictor of CSO achievement, and patients achieving SCB were significantly younger (30.3 ± 12 vs 35.6 ± 12 years; P = .017) with significantly lower body mass index (BMI) (24.7 ± 6.4 vs 27.9 ± 7; P = .009). Preoperative chronic pain and history of orthopaedic surgery were negative predictors of PROMIS-PI CSO achievement, whereas higher (worse) preoperative PROMIS-PI scores were a positive predictor.

Conclusion: Our study defined the MCID, PASS, and SCB for the PROMIS-PF CAT and PROMIS-PI CAT at 1 year postoperatively. Patients with higher preoperative PROMIS scores, younger age, and lower BMI were more likely to achieve CSO, whereas preoperative chronic pain and history of orthopaedic surgery were negative predictors of CSO achievement.

BACK

Association Between Orientation and Magnitude of Femoral Torsion and Propensity for Clinically Meaningful Improvement After Hip Arthroscopy for Femoroacetabular Impingement Syndrome: A Computed Tomography Analysis

Kyle N. Kunze, MD, Thomas D. Alter, MS‡, Alexander C. Newhouse, BS, Felipe S. Bessa, MD, Joel C. Williams, MD, Shane J. Nho, MD, MS

First Published June 24, 2021; pp. 2466–2474

https://doi.org/10.1177/03635465211021610

Background: Femoral torsion imaging measurements and classifications are heterogeneous throughout the literature, and the influence of femoral torsion on clinically meaningful outcome improvement after hip arthroscopy for femoroacetabular impingement syndrome (FAIS) has not been well studied.

Purpose: To (1) perform a computed tomography (CT)–based analysis to quantify femoral torsion in patients with FAIS and (2) explore the relationship between the orientation and magnitude of femoral torsion and the propensity for clinically meaningful outcome improvement after hip arthroscopy.

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

Methods: Consecutive patients who underwent hip arthroscopy for FAIS between January 2012 and April 2018 were identified. Inclusion criteria were the presence of preoperative CT imaging with transcondylar slices of the knee and minimum 2-year outcome measures. Exclusion criteria were revision hip arthroscopy, Tönnis grade >1, congenital hip condition, hip dysplasia (lateral center-edge angle <20°), and concomitant gluteus medius or minimus repair. Torsion groups were defined as severe retrotorsion (SR; <0°), moderate retrotorsion (MR; 0°-5°), normal torsion (N; 5°-20°), moderate antetorsion (MA; 20°-25°), and severe antetorsion of antetorsion (SA; >25°). Treatment did not differ based on femoral torsion. Patient characteristics and clinical outcomes were analyzed, including the Hip Outcome Score–Activities of Daily Living (HOS-ADL), Hip Outcome Score–Sports Subscale (HOS-SS), modified Harris Hip Score (mHHS), international Hip Outcome Tool (iHOT-12), visual analog scale (VAS) for pain, and VAS for satisfaction. Achievement of the minimal clinically important difference (MCID) and patient acceptable symptom state (PASS) by torsion stratification was analyzed using the chi-square test. Inter- and intrarater reliabilities for CT measurements were 0.980 ($P < .001$) and 0.974 ($P < .001$), respectively.

Results: The study included 573 patients with a mean ± SD age and body mass index of 32.6 ± 11.8 years and 25.6 ± 10.6, respectively. The mean ± SD femoral torsion for the study population was 12.3°± 9.3°. After stratification, the number of patients within each group and the mean ± SD torsion for each group were as follows: SR (n = 36; –6.5°± 7.1°), MR (n = 80; 2.8°± 1.4°), N (n = 346; 12.3°± 4.1°), MA (n = 64; 22.2°± 1.4°), and SA (n = 47; 30.3°± 3.7°). No significant differences in age, body mass index, sex, tobacco use, workers' compensation status, or participation in physical activity were observed at baseline. No significant differences were seen in pre- and postoperative VAS pain, mHHS, HOS-ADL, HOS-SS, iHOT-12, or postoperative VAS satisfaction among the cohorts. Furthermore, no statistically significant differences were found in the proportion of patients who achieved the MCID or the PASS for any outcome among the groups.

Conclusion: The orientation and severity of femoral torsion at the time of hip arthroscopy for FAIS did not influence the propensity for clinically significant outcome improvement.

BACK

Image-Guided Intra-articular Hip Injections and Risk of Infection After Hip Arthroscopy

Nathan H. Varady, MD, MBA*, Troy B. Amen, MD, MBA, Paul F. Abraham, MD, Ahab Chopra, David M. Freccero, MD, Eric L. Smith, MD, Scott D. Martin, MD

First Published June 23, 2021; pp. 2482–2488

https://doi.org/10.1177/03635465211022798

Background: Although intra-articular injections are important in the management of patients who may later undergo hip arthroscopy, conflicting data are available regarding the safety of such injections when administered within 3 months of surgery. Furthermore, despite the increasing use of image-guided intra-articular hip injections, it is unknown whether the type of imaging modality used is associated with infection after hip arthroscopy.

Purpose: To assess the risk of infection associated with image-guided intra-articular injections before hip arthroscopy and, secondarily, compare that risk between ultrasound (US) and fluoroscopic (FL) guidance.

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

Methods: This was a retrospective cohort study of patients in a large national insurance database who underwent hip arthroscopy between 2007 and 2017. Patients were required to have continuous enrollment from at least 1 year before to 6 months after hip arthroscopy. Patient age, sex, geographic region, medical history, surgical details, and hip injections were collected. Patients who underwent injection ≤3 months preoperatively and >3 to ≤12 months preoperatively were compared with patients who did not undergo preoperative injection. Bivariate analyses and multivariable logistic regressions were used to assess the association between ipsilateral preoperative hip injection and surgical site infection within 6 months of surgery.

Results: We identified 17,987 patients (36.3% female; mean ± SD age, 37.6 ± 14.0 years) undergoing hip arthroscopy, 2276 (12.7%) of whom had an image-guided hip injection in the year preceding surgery (53.0% FL). Patients who underwent intra-articular injection ≤3 months preoperatively had similar infection rates to patients who did not undergo preoperative injection in the year before surgery for both the FL (0.46% vs 0.46%; P≥ .995) and the US cohorts (0.50% vs 0.46%; P = .76). Results persisted in adjusted analysis (FL ≤3 months: OR, 1.04; 95% CI, 0.32-3.37; P = .94; US ≤3 months: OR, 1.19; 95% CI, 0.36-3.90; P = .78). Similar results were seen for patients undergoing injections >3 to ≤12 months preoperatively.

Conclusion: Postoperative infection was rare in patients undergoing intra-articular hip injection ≤3 months before hip arthroscopy and was no more common than in patients not undergoing preoperative injection. Moreover, no differences were seen in infection risk between US and FL guidance. Although intra-articular hip injections should always be administered with careful consideration, these results do not suggest that these injections are uniformly contraindicated in the 3 months preceding hip arthroscopy.

BACK

Miscellaneous

-

BACK