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Contact 4@erasmusmc.nl

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Upper extremity

Arthroscopy

Level of the Subscapularis Split During Arthroscopic Latarjet

Alexandre Lädermann, M.D., Patrick J. Denard, M.D., Paolo Arrigoni, M.D., Pablo Narbona, M.D., Stephen S. Burkhart, M.D., Johannes Barth, M.D.

Arthroscopy, December 2017, Volume 33, Issue 12, Pages 2120–2124

http://dx.doi.org/10.1016/j.arthro.2017.06.013

Purpose
To determine the location of the subscapularis split during arthroscopic Latarjet created by an inside-out technique passing a switching stick from the posterior portal across the glenohumeral joint.

Methods
An inside-out technique was used to arthroscopically create a subscapularis split in 20 fresh-frozen human cadaveric shoulders. The distance between the exit point of the switching stick and the upper border of the subscapularis and the anterior circumflex vessels was measured arthroscopically and after open dissection.

Results
Twelve splits were in the upper third of the subscapularis, 3 were at the junction of the upper third and the middle third, and 5 were in the middle third. None were at the junction between the middle and lower third as desired.

Conclusions
Using the inside-out method during arthroscopic Latarjet may produce a high subscapularis split if it is performed from with a switching stick that is inserted through the posterior approach, and passed across the glenohumeral joint at the level of the inferior glenoid.

Clinical Relevance
This study analyzed the relative risk of high subscapularis split during the arthroscopic Latarjet procedure.

BACK

Arthroscopic Latarjet Procedure With Anterior Capsular Reconstruction: Clinical Outcome and Radiologic Evaluation With a Minimum 2-Year Follow-Up

Yi-Ming Zhu, M.D., Chunyan Jiang, M.D., Ph.D., Guanyang Song, M.D., Yi Lu, M.D., Fenglong Li, M.D.

Arthroscopy, December 2017, Volume 33, Issue 12, Pages 2128–2135

http://dx.doi.org/10.1016/j.arthro.2017.06.014

Purpose
To investigate the clinical and radiographic outcomes of the modified arthroscopic Latarjet procedure at a minimum of 2 years after surgery.

Methods
Patients who had traumatic unidirectional anterior shoulder instability and treated with a modified arthroscopic Latarjet procedure were included. During surgery, the anterior capsule was preserved and repaired back to the glenoid after the coracoid transfer. The clinical results (range of motion, American Shoulder and Elbow Surgeons [ASES] score, Constant-Murley score, and Rowe score) and computed tomographic results were followed.

Results
From February 2013 to September 2014, 52 consecutive patients were included. The average duration of follow-up was 28.4 months (range, 24.0-41.7 months). At final follow-up, no recurrent dislocation had occurred. The ASES score and Rowe score improved significantly (ASES score from 85.6 ± 12.7 before surgery to 93.6 ± 5.4 after surgery, $P < .0001$; Rowe score from 41.5 ± 7.2 before surgery to 92.2 ± 8.7 after surgery, $P < .0001$). No significant change was found regarding range of motion and the Constant-Murley score. Bone union was achieved in all cases. The transferred coracoid was at the level of the glenoid in all cases. The transferred coracoid was placed below the equator in 48 of 52 cases (92.3%). The orientation of the screw was 22.6° ± 10.8°. Bone resorption around the proximal screw was significantly more prominent than that around the distal screw ($P < .0001$).

Conclusions
The arthroscopic Latarjet procedure with concomitant anterior capsular reconstruction can achieve satisfactory clinical outcomes for the treatment of anterior shoulder instability with marked glenoid bone loss at a minimum of 2 years' follow-up. A satisfactory coracoid graft position, proper screw orientation, and high healing rate of the transferred coracoid can be expected. Bone resorption around the proximal screw is more severe than that around the distal screw.

Level of Evidence
Level IV, therapeutic case series.

BACK

Clinical and Radiographic Outcomes With Assessment of the Learning Curve in Arthroscopically Assisted Latissimus Dorsi Tendon Transfer for Irreparable Posterosuperior Rotator Cuff Tears

Kotaro Yamakado, M.D., Ph.D.

Arthroscopy, December 2017, Volume 33, Issue 12, Pages 2144–2151

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Purpose
To evaluate the clinical results of an arthroscopy-assisted latissimus dorsi tendon transfer (aLD) for irreparable posterosuperior cuff tears as a primary surgery. The secondary aim of this study was to quantify the learning curve using the log-linear model. We hypothesized that aLD significantly improved shoulder function and that there was consistent reduction of the operative time in support of a learning-curve effect.

Methods
After the arthroscopic partial repair was completed, the latissimus dorsi tendon was harvested via axillary mini-open incision and fixed with a knotless anchor arthroscopically. All patients were evaluated preoperatively and postoperatively using a modified University of California Los Angeles (UCLA) scoring system, active range of motion, and the visual analog scale (VAS) for pain. The operative time was recorded to quantify the learning curve using a log-linear model.

Results
Thirty patients with a mean age of 67.4 years who underwent aLD were included. At a mean of 34 months after an aLD, the mean UCLA score increased from 15.7 preoperatively to 28.8 postoperatively ($P < .001$). The mean active forward elevation increased from 105° preoperatively to 149° postoperatively ($P < .001$). The mean active external rotation increased from 22° preoperatively to 32° postoperatively ($P < .001$). The VAS improved from 58 mm to 18 mm ($P < .001$). In all but 2 cases (93%), the preoperative osteoarthritis grade was maintained. The mean operative time was 145 minutes. A significant linear correlation was observed between the operative time and cumulative volume of cases after performing a logarithmic transformation. The learning rate was calculated as 84%.

Conclusions
Arthroscopy-assisted latissimus dorsi tendon transfer is a technically demanding procedure; however, it can lead to significant improvements in overall shoulder pain and function. This study also confirmed a learning-curve effect for the aLD. The learning rate was 84%, indicating the existence of a long learning period.

Level of Evidence
Level IV, therapeutic case series.

BACK

Arthroscopic Debridement for Primary Degenerative Osteoarthritis of the Elbow Leads to Significant Improvement in Range of Motion and Clinical Outcomes: A Systematic Review

Kyle R. Sochacki, M.D., Robert A. Jack II, M.D., Takashi Hirase, M.P.H., Patrick C. McCulloch, M.D., David M. Lintner, M.D., Shari R. Liberman, M.D., Joshua D. Harris, M.D.

Arthroscopy, December 2017, Volume 33, Issue 12, Pages 2255–2262

http://dx.doi.org/10.1016/j.arthro.2017.08.247

Purpose
The purpose of this investigation was to determine whether arthroscopic debridement of primary elbow osteoarthritis results in statistically significant and clinically relevant improvement in (1) elbow range of motion and (2) clinical outcomes with (3) low complication and reoperation rates.

Methods
A systematic review was registered with PROSPERO and performed using PRISMA guidelines. Databases were searched for studies that investigated the outcomes of arthroscopic debridement for the treatment of primary osteoarthritis of the elbow in adult human patients. Study methodological quality was analyzed. Studies that included post-traumatic arthritis were excluded. Elbow motion and all elbow-specific patient-reported outcome scores were eligible for analysis. Comparisons between preoperative and postoperative values from each study were made using 2-sample *Z*-tests (http://in-silico.net/tools/statistics/ztest) using a *P* value < .05.

Results
Nine articles (209 subjects, 213 elbows, 187 males, 22 females, mean age 45.7 ± 7.1 years, mean follow-up 41.7 ± 16.3. months; 75% right, 25% left; 79% dominant elbow, 21% nondominant) were analyzed. Elbow extension (23.4°-10.7°, Δ 12.7°), flexion (115.9°-128.7°, Δ 12.8°), and global arc of motion (94.5°-117.6°, Δ 23.1°) had statistically significant and clinically relevant improvement following arthroscopic debridement (*P* < .0001 for all). There was also a statistically significant (*P* < .0001) and clinically relevant improvement in the Mayo Elbow Performance Score (60.7-84.6, Δ 23.9) postoperatively. Six patients (2.8%) had postoperative complications. Nine (4.2%) underwent reoperation.

Conclusions
Elbow arthroscopic debridement for primary degenerative osteoarthritis results in statistically significant and clinically relevant improvement in elbow range of motion and clinical outcomes with low complication and reoperation rates.

Level of Evidence
Systematic review of level IV studies.

BACK

Porcine Dermis Patch Augmentation of Supraspinatus Tendon Repairs: A Pilot Study Assessing Tendon Integrity and Shoulder Function 2 Years After Arthroscopic Repair in Patients Aged 60 Years or Older

Matthias Flury, M.D., Dominik Rickenbacher, M.Sc., Christian Jung, M.D., Marco M. Schneider, M.D., David Endell, M.D., Laurent Audigé, Ph.D.

Arthroscopy, January 2018, Volume 34, Issue 1, Pages 24–37

http://dx.doi.org/10.1016/j.arthro.2017.06.024

Purpose
To investigate the 2-year postoperative clinical and subjective outcomes after arthroscopic rotator cuff repair (ARCR) with xenologous porcine dermal patch augmentation compared with ARCR alone.

Methods
Patients aged 60 years or older with a complete supraspinatus (SSP) tendon tear underwent primary ARCR with a transosseous-equivalent technique. By use of a matched-pair comparative trial design, a consecutive series of 20 patients receiving additional xenologous porcine dermal patch augmentation (patch group) was matched by tear location with 20 patients who received ARCR only (control group). Prior conservative treatment failed in all patients. Patients with concomitant pathologies precluding accurate repair assessment, partial or open reconstruction, or a latissimus dorsi and/or pectoralis major muscle transfer were excluded. Patients reported daily pain levels for 10 days after surgery. Clinical parameters and various patient-reported outcome scores were documented preoperatively and at 3, 6, and 24 months after surgery. Repair integrity was determined by magnetic resonance imaging or ultrasound at 24 months. Adverse events were recorded. Group outcome differences were analyzed with *t* tests, Fisher exact tests, and mixed models.

Results
Patients in both groups were aged 67 years on average (range, 60-74 years), and 70% of patients were men. Patients in the patch group had slightly more SSP fatty infiltration preoperatively. Patch surgical procedures were on average 22 minutes longer than control interventions (P = .003). At 24 months, 4 patients and 9 patients were diagnosed with a recurrent SSP tendon defect in the control group (n = 20) and patch group (n = 19), respectively (relative risk, 2.4; P = .096). Of 11 defects (85%) identified as medial cuff failure, 8 occurred in the patch group. Pain rated by all patients decreased from postoperative day 1 to day 10 without any significant group difference (P = .348). No significant group differences were noted for other outcome parameters, and recurrent defects had no relevant effect on functional outcomes. Local complications (including recurrent defects) occurred in 8 patients in the control group and 12 in the patch group (P = .343).

Conclusions
Our pilot study supports the view that an SSP tear repair with porcine dermal xenograft augmentation does not benefit patients in terms of reducing the risk of a recurrent tendon defect or improving shoulder function up to 24 months after surgical repair.

Level of Evidence
Level III, therapeutic study, retrospective comparative trial.

BACK

Rapid Progressive Osteonecrosis of the Humeral Head After Arthroscopic Rotator Cuff Surgery

Je Kyun Kim, M.D., Hyeon Jang Jeong, M.D., Sang-Jin Shin, M.D., Ph.D., Jae Chul Yoo, M.D., Ph.D., Tae-Yon Rhie, M.D., Ph.D., Kyoung-Jin Park, M.D., Ph.D., Joo Han Oh, M.D., Ph.D.

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http://dx.doi.org/10.1016/j.arthro.2017.06.051

Purpose
To verify the clinical features and the risk factors of rapid progressive osteonecrosis of the humeral head after arthroscopic rotator cuff surgery (ARCS).

Methods
Data and medical records of 24 patients who had rapid progressive collapse of the humeral head after ARCS performed from October 2012 to March 2016 were retrospectively analyzed. Among them, 8 patients demonstrated no evidence of osteonecrosis of the humeral head preoperatively yet developed rapid progressive collapse of the humeral head within 12 months after ARCS.

Results
All patients were women with a mean age of 64.0 years (range, 52-74 years), and all of them had surgery on their dominant side. Sudden pain developed at a mean 4 months (range, 0-6 months) after index surgery. The rapid progressive collapse of the humeral head occurred within 12 months after index surgery. No clear risk factor or evidence supporting an association between ARCS and humeral head osteonecrosis was found.

Conclusions
Although the cause of the rapid progressive humeral head osteonecrosis after ARCS still needs to be established, surgeons should be aware of the possible development of humeral head osteonecrosis after ARCS, especially in older women with dominant arm involvement.

Level of Evidence
Level IV, prognostic case series.

BACK

Functional and Radiographic Outcomes After Arthroscopic Transosseous Suture Repair of Medium Sized Rotator Cuff Tears

Xiao Ning Liu, M.D., Cheol-Jung Yang, M.D., Geun Woo Lee, M.D., Sang Hyun Kim, M.D., Yong-Hyun Yoon, M.D., Kyu-Cheol Noh, M.D., Ph.D.

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Purpose
To evaluate the functional and anatomical outcomes after arthroscopic transosseous suture (TOS) repair of 2 to 4 cm sized rotator cuff tears and to identify preoperative factors influencing repair failure.

Methods
From May 2013 to August 2014, patients with symptomatic 2 to 4 cm full-thickness tears underwent arthroscopic TOS repair, and those who could be followed up for a minimum of 2 years were included in this retrospective study. Functional and anatomical outcomes were analyzed up to 2 years postoperatively. Factors affecting cuff repair failure were evaluated, using both univariate and multivariate analyses.

Results
Twenty-seven patients were included. On preoperative magnetic resonance imaging data, the mean anteroposterior dimension tear size was 27.0 ± 3.3 mm and mean retraction was 30.7 ± 3.1 mm. Anatomic failure (Sugaya III, IV, and V) rate was 33% with arthroscopic TOS repair; however, significant improvements were found regardless of cuff healing. Mean American Shoulder and Elbow Surgeons score (range, 0-100) improved from 48.8 ± 16.6 preoperatively to 80.1 ± 11.1 postoperatively ($P < .001$), mean Constant score (range, 0-100) improved from 54.5 ± 11.8 to 73.7 ± 8.5 ($P < .001$), and mean pain visual analog scale score (range, 0-10) improved from 3.9 ± 1.7 to 2.0 ± 1.1 ($P < .001$). These changes reached each minimal clinically important difference previously reported. Greater tear size in anteroposterior dimension ($P = .034$), decreased acromiohumeral distance ($P = .022$), and higher fatty infiltration of supraspinatus ($P = .011$) were independent preoperative factors associated with repair failure. Twelve patients (44%) experienced intraoperative bone laceration.

Conclusions
Arthroscopic TOS repair was a reliable technique for patients with 2 to 4 cm size rotator cuff tear. Preoperative factors associated with cuff repair failure were greater tear size in anteroposterior dimension, decreased acromiohumeral distance, and higher fatty infiltration of supraspinatus.

Level of Evidence
Level III, retrospective comparative study.

BACK

Five-Year Outcomes After Arthroscopic Repair of Partial-Thickness Supraspinatus Tears

Alexander R. Vap, M.D., Sandeep Mannava, M.D., Ph.D., J. Christoph Katthagen, M.D., Marilee P. Horan, M.P.H., Erik M. Fritz, M.D., Jonas Pogorzelski, M.D., M.H.B.A., Peter J. Millett, M.D., M.Sc.

Arthroscopy, January 2018, Volume 34, Issue 1, Pages 75–81

http://dx.doi.org/10.1016/j.arthro.2017.07.028

Purpose
To investigate clinical outcomes in patients who underwent arthroscopic repair of isolated partial-thickness rotator cuff tears (PTRCTs) of the supraspinatus tendon with a minimum follow-up period of 5 years.

Methods
All patients who had undergone arthroscopic repair of isolated PTRCTs at least 5 years earlier were included. Preoperatively and postoperatively, the American Shoulder and Elbow Surgeons, QuickDASH (short version of Disabilities of the Arm, Shoulder and Hand questionnaire), and Short Form 12 Physical Component Summary scores were collected, along with postoperative satisfaction (10-point scale) and return to activity. The associations between (1) patient age and outcome scores and (2) location of partial-thickness tear (articular vs bursal sided) and outcome scores were evaluated. Failure was defined as revision surgery of the rotator cuff repair.

Results
The study included 24 shoulders (24 patients comprising 9 women and 15 men). Follow-up data were available on 20 shoulders (7 women and 13 men, 83% follow-up) at a mean of 6 ± 1 years postoperatively. The mean age at index surgery was 55 ± 11 years; 6 bursal- and 14 articular-sided tears were repaired. No patient required revision surgery. All scores significantly improved from preoperatively to postoperatively ($P < .05$); the median satisfaction rating (1, not satisfied; 10, completely satisfied) was 10 (range, 1-10). Neither patient age nor tear location correlated with outcome scores ($P > .05$). Seventeen patients indicated that they participated in previous recreational activity. Of these patients, 13 (76%) returned to the original level or a similar level of activity, 3 (18%) returned to activity at a lower level, and only 1 (6%) indicated an inability to return to activity.

Conclusions
Patients undergoing arthroscopic repair of PTRCTs can expect excellent clinical outcomes with low failure rates at midterm follow-up given that no patient progressed to revision rotator cuff repair during follow-up. The return-to-activity rate was very high after repair of isolated PTRCTs. Neither patient age nor tear location was associated with outcome scores.

Level of Evidence
Level IV, retrospective case series.

BACK

Preliminary Results of Arthroscopic Superior Capsule Reconstruction with Dermal Allograft

Patrick J. Denard, M.D., Paul C. Brady, M.D., Christopher R. Adams, M.D., John M. Tokish, M.D., Stephen S. Burkhart, M.D.

Arthroscopy, January 2018, Volume 34, Issue 1, Pages 93–99

http://dx.doi.org/10.1016/j.arthro.2017.08.265

Purpose
The purpose of this study was to evaluate the short-term outcomes of arthroscopic superior capsule reconstruction (SCR) with dermal allograft for the treatment of irreparable massive rotator cuff tears (MRCTs).

Methods
A multicenter study was performed on patients undergoing arthroscopic SCR for irreparable MRCTs. The minimum follow-up was 1 year. Range of motion and functional outcome according to visual analog scale (VAS) pain, American Shoulder and Elbow Surgeons (ASES) score, and subjective shoulder value (SSV) score were assessed preoperatively and at final follow-up. Radiographs were used to evaluate the acromiohumeral interval (AHI).

Results
Fifty-nine patients with a mean age of 62.0 years had a minimum follow-up of 1 year. Twenty-five patients (42.4%) had a prior rotator cuff repair. Forward flexion improved from 130° preoperative to 158° postoperative, and external rotation improved from 36° to 45°, respectively ($P < .001$). Compared with preoperative values, the VAS decreased from 5.8 to 1.7, the ASES score improved from 43.6 to 77.5, and the SSV score improved from 35.0 to 76.3 ($P < .001$). The AHI was 6.6 mm at baseline and improved to 7.6 mm at 2 weeks postoperatively but decreased to 6.7 mm at final follow-up. Based on postoperative magnetic resonance imaging, 45% (9 of 20) of the grafts demonstrated complete healing. Forty-six (74.6%) cases were considered a success. Eleven patients (18.6%) underwent a revision procedure including 7 reverse shoulder arthroplasties.

Conclusions
Arthroscopic SCR using dermal allograft provides a successful outcome in approximately 70% of cases in an initial experience. The preliminary results are encouraging in this difficult to manage patient population, but precise indications are important and graft healing is low in our initial experience.

Level of Evidence
Level IV, case series.

BACK

Clinical Outcome of Arthroscopic Treatment for Posteromedial Elbow Impingement in Adolescent Baseball Players

Tetsuya Matsuura, M.D., Toshiyuki Iwame, M.D., Naoto Suzue, M.D., Jyoji Iwase, M.D., Shunsuke Tamaki, M.D., Kenji Yokoyama, M.D., Koichi Sairyo, M.D.

Arthroscopy, January 2018, Volume 34, Issue 1, Pages 105–110

http://dx.doi.org/10.1016/j.arthro.2017.06.053

Purpose
To evaluate the clinical outcomes of arthroscopic treatment in adolescent baseball players with posteromedial elbow impingement.

Methods
This retrospective study evaluated the clinical outcome of arthroscopic treatment for posteromedial elbow impingement in adolescent baseball players. Patients were eligible for participation if they had undergone surgery at least 2 years earlier and excluded if they had arthritis, loose bodies, osteochondritis dissecans, ulnar collateral ligament tear, flexor/pronator injuries or medial epicondylitis, or nerve problems. Patients were also excluded if they had undergone prior elbow surgery, were younger than 13 years, or were older than 19 years. Arthroscopic treatment included debridement of posteromedial synovitis, fragment removal, and olecranon spur excision. At a mean follow-up of 26.7 (range 24-42) months, patients were evaluated based on a questionnaire, examination, and the previously reported elbow outcome score.

Results
This retrospective study involved 15 male patients, comprising 6 pitchers, 3 catchers, and 6 fielders, of mean age 15.7 (range 14-17) years. Mean time from onset of symptoms to surgery was 4.9 (range 3-18) months. Intraoperative findings included posteromedial synovitis and olecranon spurs in all patients and fragments in 10. The elbow outcome score was considered excellent in 11 patients and good in 2, with a mean score of 92 points (maximum 100 points). The mean postoperative range of motion at the elbow was 5° to 139.7° of flexion. All patients were able to return to their previous level of play after an average of 3.4 (range 2.5-4.5) months. No patient developed medial instability that later required reconstructive surgery.

Conclusions
Arthroscopic debridement, excision of the olecranon spur, and removal of fragments yield reliable subjective and objective results and allow a return to baseball in adolescent patients.

Level of Evidence
Level IV, therapeutic case series.

Knee Surgery, Sports Traumatology, Arthroscopy

Preoperative CT planning of screw length in arthroscopic Latarjet

Alexandre Hardy, Antoine Gerometta, Benjamin Granger, Audrey Massein, Laurent Casabianca, Hugues Pascal-Moussellard

January 2018, Volume 26, Issue 1, pp 24–30

https://link.springer.com/article/10.1007/s00167-016-4286-8

Purpose:
The Latarjet procedure has shown its efficiency for the treatment of anterior shoulder dislocation. The success of this technique depends on the correct positioning and fusion of the bone block. The length of the screws that fix the bone block can be a problem. They can increase the risk of non-union if too short or be the cause of nerve lesion or soft tissue discomfort if too long. Suprascapular nerve injuries have been reported during shoulder stabilisation surgery up to 6 % of the case. Bone block non-union depending on the series is found around 20 % of the cases. The purpose of this study was to evaluate the efficiency of this CT preoperative planning to predict optimal screws length. The clinical importance of this study lies in the observation that it is the first study to evaluate the efficiency of CT planning to predict screw length.

Methods:
Inclusion criteria were patients with chronic anterior instability of the shoulder with an ISIS superior to 4. Exclusion criteria were patients with multidirectional instability or any previous surgery on this shoulder. Thirty patients were included prospectively, 11 of them went threw a CT planning, before their arthroscopic Latarjet. Optimal length of both screws was calculated, adding the size of the coracoid at 5 and 15 mm from the tip to the glenoid. Thirty-two-mm screws were used for patients without planning. On a post-operative CT scan with 3D reconstruction, the distance between the screw tip and the posterior cortex was measured. A one-sample Wilcoxon test was used to compare the distance from the tip of the screw to an acceptable positioning of ±2 mm from the posterior cortex.

Results:
In the group without planning, screw 1 tended to differ from the acceptable positioning: mean 3.44 mm ± 3.13, med 2.9 mm, q1; q3 [0.6; 4.75] $p = 0.1118$, and screw 2 differed significantly from the acceptable position: mean 4.83 mm ± 4.11, med 3.7 mm, q1; q3 [1.7; 5.45] $p = 0.0045$. In the group with planning, position of screw 1 or 2 showed no significant difference from the acceptable position: mean 2.45 mm ± 2.07 med 1.8 mm, q1; q3 [1; 3.3] $p = 1$; mean 2.75 mm ± 2.32 med 2.3 mm, q1; q3 [1.25; 3.8] $p = 0.5631$.

Conclusion:
Unplanned Latarjet can lead to inaccurate screw length especially in the lower screw and can increase the risk of non-union and nerve damage. The clinical relevance of this article is that CT planning of screw length before surgery showed good results on post-operative CT.

BACK

Reliability of a CT reconstruction for preoperative surgical planning in the arthroscopic Latarjet procedure

Alexandre Hardy, Antoine Gerometta, Benjamin Granger, Audrey Massein, Laurent Casabianca, Hugues Pascal-Moussellard

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https://link.springer.com/article/10.1007/s00167-016-4329-1

Purpose
The arthroscopic Latarjet procedure has provided reliable results in the treatment of anterior shoulder instability. However, this procedure remains technically challenging and is related to several complications. The morphology of the coracoid and the glenoid are inconsistent. Inadequate coracoid and glenoid preparing may lead to mismatching between their surfaces. Inadequate screws lengthening and orientation are a major concern. Too long screws can lead to suprascapular nerve injuries or hardware irritation, whereas too short screws can lead to nonunions, fibrous unions or migration of the bone block. The purpose of the study was to investigate the application of virtual surgical planning and digital technology in preoperative assessment and planning of the Latarjet procedure.

Methods
Twelve patients planned for an arthroscopic Latarjet had a CT scan evaluation with multi-two-dimensional reconstruction performed before surgery. Interobserver and intraobserver reliability were evaluated. The shape of the anterior rim of the glenoid and the undersurface of the coracoid were classified. Coracoid height was measured, respectively, at 5 mm (C1) and 10 mm (C2) from the tip of the coracoid process, corresponding to the drilling zone. Measurements of the glenoid width were then taken in the axial view at 25 % (G1) and 50 % (G2) of the glenoid height with various α angles (5°, 10°, 15°, 20°, 25°, 30°) 7 mm from the anterior glenoid rim. Shapes of the undersurface of the coracoid and the anterior rim of the glenoid were noted during the surgical procedure. Post-operative measurements included the *α*angle.

Results
Concerning coracoid height measurements, there was an almost perfect to substantial intra- and inter-reliability, with values ranging from ICC = 0.75–0.97. For the shape of the coracoid, concordances were, respectively, perfect (ICC = 1) and almost perfect (0.87 [0.33; 1]) for the intra- and interobserver reliabilities. Concerning the glenoid, concordance was always almost perfect for 50 % height. Concordance was almost perfect for 25 % height 15° and 30° for inter- and intraobserver, for intraobserver at 0° and 25°. All the other values were still showing moderate concordance. Shape of the coracoid analysis reproducibility was perfect for both intra- and interobserver ICC = 1. There was a total agreement (ICC = 1) between the preoperative evaluation of the shape of the glenoid and the coracoid and the intraoperative assessment.

Conclusion
The ideal and accurate preoperative planning of screwing of the coracoid graft in the arthroscopic Latarjet can be achieved in the real surgery assisted by the virtual planning. The clinical importance of this study lies in the observation that this new preoperative planning could offer a simple, effective and reproducible tool for surgeons helping them to prepare in the best possible way a technically challenging procedure usually associated with a high rate of complications

BACK

Concomitant coracoplasty during arthroscopic subscapularis repair does not yield better clinical outcomes and structural integrity

Sung-Jae Kim, Yun-Rak Choi, Min Jung, Yeo-Kwon Yoon, Yong-Min Chun

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https://link.springer.com/article/10.1007/s00167-016-4368-7

Purpose
Few studies have examined whether concomitant coracoplasty is necessary to improve clinical and radiological outcomes after arthroscopic subscapularis repair. The purpose of this study was to compare clinical outcomes and structural integrity after arthroscopic repair of isolated subscapularis full-thickness tear, either with or without concomitant coracoplasty.

Methods
This study included 62 patients who underwent arthroscopic subscapularis repair either with coracoplasty (Group A, 35 patients) or without coracoplasty (Group B, 27 patients). Preoperative and postoperative visual analog scale pain scores, subjective shoulder values, University of California at Los Angeles shoulder scores, American Shoulder and Elbow Surgeon scores, subscapularis strength, and shoulder active range of motion (ROM) were assessed. Postoperative magnetic resonance arthrography (MRA) or computed tomographic arthrography (CTA) was performed 6 months postoperatively for structural integrity assessment.

Results
At 2-year follow-up, all functional scores and ROM improved significantly in both groups compared with preoperative values ($p < 0.001$). However, none of these values differed significantly between groups. On follow-up MRA or CTA images, although postoperative coracohumeral distance was significantly greater in Group A (8.4 mm ± 2.3 mm versus 7.0 mm ± 2.0 mm) ($p = 0.018$), the re-tear rates were not significantly different between groups (5/35 (14%) in Group A and 4/27 (15%) in Group B).

Conclusions
For isolated subscapularis full-thickness tears, concomitant coracoplasty with arthroscopic repair did not produce better clinical outcomes or structural integrity than repair without coracoplasty. This suggests that concomitant coracoplasty may not be imperative during arthroscopic repair of isolated subscapularis full-thickness tears.

Level of evidence
III.

BACK

Long-term results of arthroscopic Bankart repair: Minimum 10 years of follow-up

Tapio Flinkkilä, Rony Knape, Kai Sirniö, Pasi Ohtonen, Juhana Leppilahti

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Purpose
This study investigated the long-term results of arthroscopic Bankart repair in terms of rates and timelines of recurrence of instability, with special interest in young adult patients aged ≤20 years.

Methods
Between 2000 and 2005, 186 shoulders [182 patients, 50 women, median age 26 (range 15–58) years] were operated on at a university hospital using arthroscopic Bankart repair because of instability after traumatic anteroinferior shoulder dislocation. Medical records were retrospectively reviewed and patients were assessed using postal questionnaires or telephone interview after a minimum of 10 years of follow-up [median 12.2 (range 10–16) years]. The primary outcome measure was recurrence of instability (assessed from 167 shoulders), other outcome measures included Oxford instability score (OIS), subjective shoulder value (SSV), and Western Ontario instability index (WOSI) (assessed from 157 shoulders).

Results
At the end of follow-up, 50/167 shoulders (30%) had recurrence of instability and 30/167 (18%) were subjected to reoperation due to instability symptoms. Twenty-six (52%) failures occurred within ≤2 years, 11 (22%) within 2–5 years, and 13 (26%) >5 years after surgery. Failure rate was 19/35 (54%) for patients aged ≤20 years and 31/132 (24%) for patients aged >20 years; reoperation rates were 11/35 (31%) and 19/132 (14%), respectively. Mean OIS was 20 (SD 9, range 12–50), SSV 83% (SD 21, range 10–100), and WOSI score 80 (SD 22, range 33–100).

Conclusions
Nearly one-third of patients had recurrence of instability after arthroscopic Bankart repair after a minimum of 10-year follow-up. Patients aged ≤20 years did poorly with more than half of the patients having recurrence; alternative stabilization techniques should probably be considered for these patients.

Level of evidence
IV.

BACK

Improved outcomes with arthroscopic repair of partial-thickness rotator cuff tears: a systematic review

J. Christoph Katthagen, Gabriella Bucci, Gilbert Moatshe, Dimitri S. Tahal, Peter J. Millett

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https://link.springer.com/article/10.1007/s00167-017-4564-0

Purpose
The optimum treatment strategy for the surgical management of partial-thickness rotator cuff tears (PTRCT) is evolving. In this study, two research questions were sought to be answered: “Does the repair technique for PTRCTs involving >50% of the tendon thickness have an effect on structural and functional outcomes of arthroscopic repair?” and “Is there a difference in outcomes of arthroscopically treated articular- and bursal-sided PTRCTs?”.

Methods
A systematic review according to the PRISMA statement was conducted to identify all literature published reporting on outcomes of arthroscopic treatment of PTRCTs classified with the Ellman classification with minimum 2-year follow-up. Prospective randomized trials were eligible for quantitative synthesis. A total of 19 studies, published between 1999 and 2015, met the inclusion criteria of this systematic review. Two studies reporting outcomes of articular-sided PTRCTs with prospective randomized study design were included in quantitative synthesis calculations.

Results
Arthroscopic repair of PTRCTs >50% thickness results in significant pain relief and good to excellent functional outcomes. When in situ repair was compared with repair of the tendon after completion to full-thickness RCT, there were no significant differences in functional or structural outcomes or complication rates. The best treatment method for low-grade PTRCTs remains unclear.

Conclusions
The repair technique (in situ repair versus repair of the tendon after completion to full-thickness RCT) did not significantly affect the outcomes for arthroscopic repair of PTRCTs >50% thickness. The current literature contains evidence for inferior outcomes and higher failure rates after arthroscopic debridement of bursal-sided compared to articular-sided PTRCTs, and some evidence suggests that repair of lower-grade bursal-sided tears may be beneficial over debridement.

Level of evidence
IV.

BACK

Excellent healing rates and patient satisfaction after arthroscopic repair of medium to large rotator cuff tears with a single-row technique augmented with bone marrow vents

Brian D. Dierckman, Jake J. Ni, Ronald P. Karzel, Mark H. Getelman

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https://link.springer.com/article/10.1007/s00167-017-4595-6

Purpose
This study evaluated the repair integrity and patient clinical outcomes following arthroscopic rotator cuff repair of medium to large rotator cuff tears using a single-row technique consisting of medially based, triple-loaded anchors augmented with bone marrow vents in the rotator cuff footprint lateral to the repair.

Methods
This is a retrospective study of 52 patients (53 shoulders) comprising 36 males and 16 females with a median age of 62 (range 44–82) with more than 24-month follow-up, tears between 2 and 4 cm in the anterior–posterior dimension and utilizing triple-loaded anchors. Mann–Whitney test compared Western Ontario Rotator Cuff (WORC) outcome scores between patients with healed and re-torn cuff repairs. Multivariate logistic regression analysed association of variables with healing status and WORC score. Cuff integrity was assessed on MRI, read by a musculoskeletal fellowship-trained radiologist.

Results
Magnetic resonance imaging (MRI) demonstrated an intact repair in 48 of 53 shoulders (91%). The overall median WORC score was 95.7 (range 27.6–100.0). A significant difference in WORC scores were seen between patients with healed repairs 96.7 (range 56.7–100.0) compared with a re-tear 64.6 (27.6–73.8), $p < 0.00056$.

Conclusions
Arthroscopic repair of medium to large rotator cuff tears using a triple-loaded single-row repair augmented with bone marrow vents resulted in a 91% healing rate by MRI and excellent patient reported clinical outcomes comparable to similar reported results in the literature.

Level of evidence
IV.

BACK

Changes of fatty infiltration according to the immediate postoperative time point in magnetic resonance imaging after arthroscopic rotator cuff repair

Ji Wan Park, Chris Hyunchul Jo, Ji Sun Shin

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https://link.springer.com/article/10.1007/s00167-017-4604-9

Purpose
Fatty infiltration (FI) is known to be an irreversible change which continues degeneration after rotator §cuff repair. Previous studies evaluated postoperative changes in FI using a preoperative baseline. This study aimed to investigate the changes in FI using an immediate postoperative baseline. We hypothesized that FI was progressed more when measured relative to an immediate postoperative baseline than to a preoperative baseline.

Methods
From 2008 to 2010, 77 patients who met the following criteria were included in this study: arthroscopic rotator cuff repair of a full-thickness rotator cuff tear and presence of preoperative (approximately 1 month before surgery), immediate postoperative (approximately 3 days after surgery), and 1-year postoperative (at least 9 months to 1 year after surgery) magnetic resonance imaging (MRI) undertaken. The exclusion criteria were: absence of any of the three MRIs, isolated subscapularis repair, and rotator cuff repair with margin convergence only. The MRIs were examined to assess the Goutallier grade of the rotator cuff muscles for the assessment of FI. Structural integrity was evaluated using the Sugaya classification. Measurements 1 year after surgery were compared with those at the preoperative and immediate postoperative time points according to the integrity.

Results
In the total and retear group, FI in the supraspinatus and infraspinatus 1 year after surgery did not change significantly relative to the preoperative baseline (all n.s.), but progressed compared to the immediate postoperative baseline (all $p < 0.001$). In the retear group, FI in the supraspinatus and infraspinatus reduced for seven and two of 20 patients, respectively, compared with the preoperative baseline; however, no patients showed a reduced FI compared with the immediate postoperative baseline.

Conclusions
The results of the study showed that the changes in FI reduced, remained or progressed in accordance with the baseline and structural integrity. FI progressed when compared with the immediate postoperative baseline than with the preoperative baseline. The immediate postoperative time point would be considered as the baseline to monitor the true changes of FI after repair.

Level of evidence
Retrospective comparative study, Level III.

BACK

Combined arthroscopically assisted coraco- and acromioclavicular stabilization of acute high-grade acromioclavicular joint separations

Carmen Hann, Natascha Kraus, Marvin Minkus, Nina Maziak, Markus Scheibel

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https://link.springer.com/article/10.1007/s00167-017-4643-2

Purpose and hypothesis
Due to high rate of persisting dynamic posterior translation (DPT) following isolated coracoclavicular double-button technique for reconstruction of the acromioclavicular (AC) joint reported in the literature, an additional acromioclavicular cerclage was added to the procedure. The aim of this study was to evaluate the clinical and radiological results of patients with high-grade AC-joint instability treated with a double TightRope technique with an additional percutaneous acromioclavicular cerclage.

Methods
Fifty-nine patients (6 f/53 m; median age 38.3 (range 21.5–63.4 years) who sustained an acute high-grade AC-joint dislocation (Rockwood type V) were treated using the above-mentioned technique. At the final follow-up, the constant score (CS), the subjective shoulder value (SSV), the Taft score (TF) and the acromioclavicular joint instability score (ACJI) as well as bilateral anteroposterior stress views with 10 kg of axial load and bilateral modified Alexander views were obtained.

Results
At a median follow-up of 26.4 (range 20.3–61.0) months, 34 patients scored a median of 90 (33–100) points in the CS, 90 (25–100) % in the SSV, 11 (4–12) points in the TF and 87 (43–100) points in the ACJI. The coracoclavicular (CC) distance was 12.1 (6.5–19.8) mm and the CC difference 2.0 (0.0–11.0) mm. Two patients (5.8%) showed a complete DPT of the AC joint, and fourteen patients (41.1%) displayed a partial DPT. The overall revision rate was 11.7%. Two patients presented implant irritation, one patient a recurrent instability, and one patient suffered from a local infection.

Conclusion
The arthroscopically assisted and image-intensifier-controlled double TightRope technique with an additional percutaneous acromioclavicular cerclage leads to good and excellent clinical results after a follow-up of 2 years. The incidence of persisting dynamic horizontal translation is lower compared to isolated coracoclavicular stabilization. Thus, we recommend using the double TightRope implant with an additional acromioclavicular cerclage.

Level of evidence
IV.

BACK

Arthroscopic management of snapping scapula syndrome improves pain and functional outcomes, although a high rate of residual symptoms has been reported

M. Memon, J. Kay, N. Simunovic, O. R. Ayeni

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https://link.springer.com/article/10.1007/s00167-017-4693-5

Purpose
To investigate the use of arthroscopy in the management of patients with snapping scapula syndrome, including aetiology, surgical decision-making, outcomes, complications, effectiveness of arthroscopy, and quality of evidence of the existing literature.

Methods
Three databases (PubMed, Ovid [MEDLINE], and EMBASE) were searched independently and in duplicate to systematically screen the literature. The Preferred Reporting Items for Systematic Reviews and Meta-analyses (PRISMA) checklist guided the reporting and data abstraction. Methodological quality of all included papers was assessed using the MINORS criteria. The results are presented in a narrative summary fashion using descriptive statistics including means, proportions, and ranges.

Results
Overall, 18 studies (5 case reports and 13 case series; all level IV evidence) were identified, including 201 patients (203 shoulders). The mean follow-up period was 32.7 months (range 1–154 months). Surgical decision-making for the use of arthroscopy was most commonly based on a failed trial of initial non-operative management in 17 studies (94%). Overall, 21% of cases achieved complete resolution of pre-operative symptoms, including pain, crepitus, and range of motion, while 68% of cases obtained some clinical improvement, but reported some residual symptoms (persistent crepitus [12%] and persistent scapulothoracic pain [4%]). Moreover, poor outcomes were reported 11% of cases and the most common complication was scapular oedema (6%).

Conclusion
Arthroscopic management of snapping scapula syndrome yields improvement in pain, crepitus, and range of motion in a majority of patients; however, most patients experience residual symptoms. Further studies are needed to compare the outcomes of shoulder arthroscopy with other available treatment options for snapping scapula syndrome. Shoulder arthroscopy for snapping scapula can improve patients' symptoms; however, patients must be informed about the high likelihood of persistent symptoms post-operatively.

Level of evidence
Systematic review of Level IV studies.

BACK

Arthroscopic management of suprascapular neuropathy of the shoulder improves pain and functional outcomes with minimal complication rates

M. Memon, J. Kay, L. Ginsberg, N. Simunovic, K. Bak, P. Lapner, O. R. Ayeni

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https://link.springer.com/article/10.1007/s00167-017-4694-4

Purpose
The purpose of this study was to systematically assess the arthroscopic management of suprascapular neuropathy, including the aetiology, surgical decision-making, clinical outcomes, and complications associated with the procedure.

Methods
Three databases [PubMed, Ovid (Medline), and Embase] were searched. Systematic literature screening and data abstraction was performed in duplicate to present a review of studies reporting on arthroscopic management of suprascapular neuropathy. The quality of the included studies was assessed using level of evidence and the MINORS (Methodological Index for Nonrandomized Studies) checklist.

Results
In total, 40 studies (17 case reports, 20 case series, 2 retrospective comparative studies, and 1 prospective comparative study) were identified, including 259 patients (261 shoulders) treated arthroscopically for suprascapular neuropathy. The most common aetiology of suprascapular neuropathy was suprascapular nerve compression by a cyst at the spinoglenoid notch (42%), and the decision to pursue arthroscopic surgery was most commonly based on the results of clinical findings and investigations (47%). Overall, 97% of patients reported significant improvement in or complete resolution of their pre-operative symptoms (including pain, strength, and subjective function of the shoulder) over a mean follow-up period of 23.7 months. Further, there was a low
overall complication rate (4%) associated with the arthroscopic procedures.

Conclusion
While most studies evaluating arthroscopic management of suprascapular neuropathy are uncontrolled studies with lower levels of evidence, results indicate that such management provides patients with significant improvements in pain, strength, and subjective function of the shoulder, and has a low incidence of complications. Patients managed arthroscopically for suprascapular neuropathy may expect significant improvements in pain, strength, and subjective function of the shoulder.

Level of evidence
Level IV, systematic review of level II to IV studies.

BACK

Arthroscopic posterior bone block stabilization-early results of an effective procedure for the recurrent posterior instability

Mathias Wellmann, Marc-Frederic Pastor, Max Ettinger, Konstantin Koester, Tomas Smith

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https://link.springer.com/article/10.1007/s00167-017-4753-x

Purpose
In the current study the clinical outcome of an arthroscopic posterior bone block augmentation in combination with a posterior capsular repair was investigated.

Methods
Twenty-four shoulders (18 patients) with unidirectional posterior shoulder instability were treated with an arthroscopic posterior bone block and capsular reconstruction. The mean follow up period was 26 months. The patients were examined pre- and postoperatively using the Constant-Murley score, the Rowe score, Walch–Duplay score and Western Ontario Shoulder index.

Results
At the follow up examination 21 shoulders were classified to be stable, while one patient reported a single redislocation and two further patients reported recurrent posterior subluxation or posterior apprehension. Thus, the recurrence rate was defined to be 12.5%. The Rowe-Score significantly improved from 50 points preoperatively to 75 points postoperatively ($p = 0.0003$). The WOSI-score significantly improved from 37% preoperatively to 66% postoperatively ($p = 0.0001$). Revision surgery commonly was required for screw removal.

Conclusion
The early clinical results of this arthroscopic bone block augmentation and capsular repair are promising.

Level of Evidence
IV.

Bone grafts used for arthroscopic glenoid reconstruction restore the native glenoid anatomy

Benjamin Bockmann , Arne Johannes Venjakob, Rolf Gebing, Frank Reichwein, Marthe Hagenacker, Wolfgang Nebelung

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https://link.springer.com/article/10.1007/s00167-017-4757-6

Purpose
Recurrent anterior instability of the glenohumeral joint is a demanding condition, especially in cases of glenoid bone loss. Various treatment options have been described, such as arthroscopic grafting techniques and the Latarjet procedure. In this study, the degree to which an arthroscopically applied iliac crest graft restores the glenoid anatomy was evalutated.

Methods
Nine patients (three women and six men) with an average age of 31 ± 9 years (21–46 years) who were treated with an arthroscopic iliac crest graft technique were included in this study. After a mean follow up of 34 ± 10 months (19–50 months) after the procedure, MRI scans of both shoulders were performed and the glenoid width, Glenoid Index (GI), Pixel Signal intensity (PSI), thickness of the tissue covering the articular aspect of the graft, inclination, version, concavity and balance stability angle were measured.

Results
All scans showed the cultivation of tissue on the graft, which visually resembled the cartilage of the native ipsilateral glenoid. Additionally, reshaping of the graft to repair the glenoid configuration could be observed. Glenoid width ($p = 0.022$) and GI ($p < 0.001$) increased significantly through surgery. The tissue examined on the graft showed a significant pixel intensity gap ($p = 0.017$) but comparable thickness (n.s.) in relation to native cartilage. The remaining parameters did not differ significantly between both shoulders.
Conclusion
In the cohort presented, iliac crest grafts were able to restore the glenoid configuration, and the glenoid was re-shaped to its native contour. Additionally, cartilage-like scar tissue with similar thickness as healthy cartilage was formed on the articular side of the graft. These results suggest that glenoid reconstruction is not only important for prevention of recurrence, but also for restoration of the native glenoid anatomy.

Level of evidence
Level III—retrospective cohort study.

BACK

Arthroscopic treatment successfully treats posterior elbow impingement in an athletic population

Jason L. Koh, Brad A. Zwahlen, David W. Altchek, Todd A. Zimmerman

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https://link.springer.com/article/10.1007/s00167-017-4563-1

Purpose
Posterior elbow impingement can cause disabling pain and limited motion during activities involving elbow extension. Less understood is whether arthroscopic treatment, compared to open surgery, can result in effective management of pain, loss of range of motion, and return athletes to previous levels of activity. This study determined whether arthroscopic debridement is a safe and effective treatment for posterior elbow impingement and whether it enables athletes to return to a previous level of function.

Methods
A retrospective review of 36 consecutive patients that underwent arthroscopic debridement of the posterior elbow was performed. There were 34 male and 2 female patients, with a median age of 32 years (17–54 years). There were 7 professional athletes, 6 college athletes, and 23 high school or recreational athletes. All patients had a positive posterior impingement test for posterior pain with extension and limitations of activity. Arthroscopic debridement and additional surgical procedures were performed, and patients underwent follow-up visits at a median 51 months (range 14–81).

Results
Significant improvements were seen in pain, motion, and function. No neurovascular complications were seen related to the arthroscopic debridement. The mean Andrews and Timmerman elbow score improved from 159 ± 27 to 193 ± 11 ($p < 0.01$). Thirty-five of thirty-six (97%) patients returned to their previous level of activity, including all professional athletes.

Conclusions
Arthroscopic management of posterior elbow impingement is safe and effective and can return patients, including professional athletes, to high-level athletic activity. Athletes with symptomatic posterior elbow impingement can be successfully and safely treated with arthroscopic debridement and typically will return to preinjury levels of activity.

Level of evidence
IV.

BACK

Arthroscopic arthrolysis provides good clinical outcome in post-traumatic and degenerative elbow stiffness

Lukas Willinger, Sebastian Siebenlist, Andreas Lenich, Franz Liska, Andreas B. Imhoff , Andrea Achtnich

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https://link.springer.com/article/10.1007/s00167-017-4630-7

Purpose and hypothesis
The purpose of this retrospective study was to report on the functional outcome after arthroscopic arthrolysis in patients with post-traumatic or degenerative elbow stiffness. It was hypothesized that this operative procedure leads to improved range of motion (ROM) and improved functional outcome in both groups.

Methods
Patients who underwent arthroscopic arthrolysis of the elbow between 2010 and 2015 were included in this study. Forty-two patients with an average age of 41.0 ± 13.5 years were available for evaluation. The mean follow-up was 28.3 ± 14.9 months. With regard to aetiology of elbow contractures, patients were divided into post-traumatic (group A) and degenerative (group B) cohort. General patients' data, previous surgical treatment and ROM were recorded. At follow-up evaluation, the clinical outcome was assessed by the ROM, visual analogue scale (VAS) for pain assessment and the Elbow Self-Assessment Score (ESAS).

Results
The mean arc of motion of group A (n = 20) increased from preoperatively 74.3° to 120.5° postoperatively (p < 0.001); group B (n = 22) showed an improvement of 104.6° preoperatively to 123.4° after surgery (p = 0.002). Mean improvement was 46.3° ± 27.5° in group A and 16.4° ± 19.4° in group B. Mean post-operative VAS was 0.9 ± 1.5 in group A and 1.3 ± 2.2 in group B. 92.9% of patients achieved a functional arc of elbow motion >100°. The ESAS indicated good to excellent clinical outcome showing 88.8 ± 10.0 points in group A and 84.1 ± 21.4 points in group B. Thirty-six patients (85.7%) returned to their previous work level after surgery.

Conclusions
Arthroscopic arthrolysis is an effective treatment option for patients with restriction in elbow motion reasoned by post-traumatic or degenerative changes. Both groups showed a significant improvement of ROM and comparable outcome scores.

Level of evidence
Therapeutic study, Level IV.

BACK

Nerve injuries do occur in elbow arthroscopy

Nick F. J. Hilgersom, Derek F. P. van Deurzen, Carina L. E. Gerritsma, Huub J. L. van der Heide Martijn J. A. Malessy, Denise Eygendaal, Michel P. J. van den Bekerom

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https://link.springer.com/article/10.1007/s00167-017-4719-z

Purpose
The purpose is to create more awareness as well as emphasize the risk of permanent nerve injury as a complication of elbow arthroscopy.

Methods
Patients who underwent elbow arthroscopy complicated by permanent nerve injury were retrospectively collected. Patients were collected using two strategies: (1) by word-of-mouth throughout the Dutch Society of Shoulder and Elbow Surgery, and the Leiden University Nerve Centre, and (2) approaching two medical liability insurance companies. Medical records were reviewed to determine patient characteristics, disease history and postoperative course. Surgical records were reviewed to determine surgical details.

Results
A total of eight patients were collected, four men and four women, ageing 21–54 years. In five out of eight patients (62.5%), the ulnar nerve was affected; in the remaining three patients (37.5%), the radial nerve was involved. Possible causes for nerve injury varied among patients, such as portal placement and the use of motorized instruments.

Conclusions
A case series on permanent nerve injury as a complication of elbow arthroscopy is presented. Reporting on this sequel in the literature is little, however, its risk is not to be underestimated. This study emphasizes that permanent nerve injury is a complication of elbow arthroscopy, concurrently increasing awareness and thereby possibly aiding to prevention.

Level of evidence
IV, case series.

BACK

Journal of Shoulder and Elbow Surgery

Hyperlipidemia increases the risk of retear after arthroscopic rotator cuff repair

Joseph W. Galvin, MAJ, DO, Douglas R. Morte, BS, Jason A. Grassbaugh, LTC, MD, Stephen A. Parada, MAJ, MD, Samuel H. Burns, CPT, MD, Josef K. Eichinger, LTC, MD LTC, MD Josef K. Eichinger LTC, MD Josef K. Eichinger

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Background
The purpose of this study was to evaluate the influence of glenoid dysplasia on outcomes after isolated arthroscopic posterior labral repair in a young military population.

Methods
Thirty-seven male patients who underwent arthroscopic posterior labral repair for symptomatic posterior shoulder instability were evaluated at a mean duration of 3.1 years. A comparative analysis was performed for those with glenoid dysplasia and without dysplasia. Additional factors analyzed included military occupational specialty (MOS), preoperative mental health clinical encounters and mental health medication use, and radiographic characteristics (version, posterior humeral head subluxation, and posterior capsular area) on a preoperative standard shoulder magnetic resonance arthrogram. The groups were analyzed with regard to shoulder outcome scores (subjective shoulder value [SSV], American Shoulder and Elbow Surgeons [ASES] rating scale, Western Ontario Shoulder Instability Index [WOSI]), need for revision surgery, and medical separation from the military.

Results
Of 37 patients, 3 (8.1%) underwent revision surgery and 6 (16%) underwent medical separation. Overall outcome assessment demonstrated a mean SSV of 67.9 (range, 25-100) ± 22.1, mean ASES of 65.6 (range, 15-100) ± 22, and mean WOSI of 822.6 (range, 5-1854) ± 538. There were no significant differences in clinical outcome scores between the glenoid dysplasia and no dysplasia groups (SSV, $P = .55$; ASES, $P = .57$; WOSI, $P = .56$). MOS ($P = .02$) and a history of mental health encounters ($P = .04$) were significantly associated with diminished outcomes.

Conclusions
The presence or absence of glenoid dysplasia did not influence the outcome after arthroscopic posterior labral repair in a young military population. However, a history of mental health clinical encounters and an infantry MOS were significantly associated with poorer clinical outcomes.

BACK

Arthroscopic treatment of posterior shoulder instability in patients with and without glenoid dysplasia: a comparative outcomes analysis

Joseph W. Galvin, MAJ, DO, Douglas R. Morte, BS, Jason A. Grassbaugh, LTC, MD, Stephen A. Parada, MAJ, MD, Samuel H. Burns, CPT, MD, Josef K. Eichinger, LTC, LTC, MD Josef K. Eichinger LTC, MD Josef K. Eichinger

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http://dx.doi.org/10.1016/j.jse.2017.05.033

Background
The purpose of this study was to evaluate the influence of glenoid dysplasia on outcomes after isolated arthroscopic posterior labral repair in a young military population.

Methods
Thirty-seven male patients who underwent arthroscopic posterior labral repair for symptomatic posterior shoulder instability were evaluated at a mean duration of 3.1 years. A comparative analysis was performed for those with glenoid dysplasia and without dysplasia. Additional factors analyzed included military occupational specialty (MOS), preoperative mental health clinical encounters and mental health medication use, and radiographic characteristics (version, posterior humeral head subluxation, and posterior capsular area) on a preoperative standard shoulder magnetic resonance arthrogram. The groups were analyzed with regard to shoulder outcome scores (subjective shoulder value [SSV], American Shoulder and Elbow Surgeons [ASES] rating scale, Western Ontario Shoulder Instability Index [WOSI]), need for revision surgery, and medical separation from the military.

Results
Of 37 patients, 3 (8.1%) underwent revision surgery and 6 (16%) underwent medical separation. Overall outcome assessment demonstrated a mean SSV of 67.9 (range, 25-100) ± 22.1, mean ASES of 65.6 (range, 15-100) ± 22, and mean WOSI of 822.6 (range, 5-1854) ± 538. There were no significant differences in clinical outcome scores between the glenoid dysplasia and no dysplasia groups (SSV, $P = .55$; ASES, $P = .57$; WOSI, $P = .56$). MOS ($P = .02$) and a history of mental health encounters ($P = .04$) were significantly associated with diminished outcomes.

Conclusions
The presence or absence of glenoid dysplasia did not influence the outcome after arthroscopic posterior labral repair in a young military population. However, a history of mental health clinical encounters and an infantry MOS were significantly associated with poorer clinical outcomes.

BACK

The outcomes and affecting factors after arthroscopic isolated subscapularis tendon repair

Yong Girl Rhee, MD1, Yeong Seok Lee, MD1, Yong Bok Park, MD, Jung Youn Kim, MD, Kwang Joon Han, MD, Jae Chul Yoo, MD MD Jae Chul Yoo MD Jae Chul Yoo

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Background
This study evaluated clinical outcomes for isolated subscapularis tendon tears treated by arthroscopic repair, the factors affecting clinical outcomes, and changes in tendon structural integrity using magnetic resonance imaging.

Methods
Between 2005 and 2013, 45 patients with isolated subscapularis tendon tears were enrolled from two institutions. Clinical outcomes were assessed using the pain visual analog scale, American Shoulder and Elbow Surgeons, and Simple Shoulder Test scores. We evaluated factors affecting clinical outcomes: trauma history, tear classification, sex, age, symptom duration, preoperative fatty infiltration grade, cross-sectional area (CSA), cranial-transversal diameter, and caudal-transversal diameter. Subscapularis tendon integrity and fatty infiltration grade were evaluated using magnetic resonance imaging.

Results
No complications occurred except for tendon rerupture in 1 patient. No significant changes in tendon structural integrity occurred except for those related to CSA. Tendon structural integrity was significantly different between tears less than one-fourth of the entire subscapularis tendon and those exceeding one-fourth. However, there were no statistically significant differences in clinical outcomes between the 2 types of tear. Age was significantly associated with clinical outcomes, including Constant, American Shoulder and Elbow Surgeons, and Simple Shoulder Test scores. Men experienced better outcomes than women in Constant and Simple Shoulder Test scores. As the postoperative period progressed, the difference in CSA, cranial-transversal diameter, and caudal-transversal diameter decreased to the point of no statistical significance.

Conclusion
Arthroscopic repair of isolated subscapularis tear provided significant functional improvements with a low rerupture rate. Age was significantly associated with clinical results.

Intraobserver and interobserver reliability of the Copeland-Levy classification for arthroscopic evaluation of subacromial impingement

Ehud Atoun, MD1, MD Ehud AtounEmail the author MD Ehud Atoun, Ron Gilat, MD1, Alexander van Tongel, MD, Riten Pradhan, MD, Ornit Cohen, BEngMsc, Ehud Rath, MD, Ofer Levy, MD, MCh(Orth), FRCS

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Background
Defining a simple and reliable classification for acromial and bursal impingement lesions is necessary to standardize terminology, to improve communication, and to allow better evaluation of the proper treatment of impingement lesions and rotator cuff tears. The purpose of this study was to assess orthopedic surgeons' intraobserver and interobserver reliability of the Copeland-Levy classification.

Methods
Six fellowship-trained orthopedic surgeons reviewed shoulder arthroscopy videos of 69 consecutive patients who underwent shoulder arthroscopy for rotator cuff tear repair or subacromial decompression. The surgeons were asked to classify impingement lesions according to the Copeland-Levy classification. One month afterward, the surgeons were requested to repeat the evaluation of the same impingement lesions. Intraobserver reliability was calculated using Cohen's weighted κ. Interobserver reliability was calculated using Kendall's *W*.

Results
Overall intraobserver reliability for acromial and bursal lesions was $\kappa = 0.86$ (95% confidence interval, 0.82-0.9) and $\kappa = 0.97$ (95% confidence interval, 0.95-0.98), respectively. Interobserver reliability for acromial and bursal lesions was $W = 0.87$ and $W = 0.92$, respectively.

Conclusion
Intraobserver and interobserver reliability of the Copeland-Levy classification among senior orthopedic surgeons is excellent. Hence, we suggest the Copeland-Levy classification be used to standardize terminology of the subacromial impingement lesion.

Arthroscopic surgical treatment of medial epicondylitis

Alexandre Tadeu do Nascimento, MD Alexandre Tadeu do Nascimento MD Alexandre Tadeu do Nascimento, Gustavo Kogake Claudio, MD

Journal of Shoulder and Elbow Surgery, Volume 26, Issue 12

http://dx.doi.org/10.1016/j.jse.2017.08.019

Background
The study purpose was to evaluate the outcomes of patients who received arthroscopic surgical treatment for medial epicondylitis refractory to conservative treatment.

Methods
This was a retrospective study of 7 patients who underwent arthroscopic surgical débridement of the common flexor tendon for treatment of medial epicondylitis refractory to conservative treatment. The patients were assessed using the Disabilities of the Arm, Shoulder and Hand score; visual analog scale for pain; and Short Form 36 Health Survey. The mean age at the time of surgery was 50 years (range, 36-67 years). The mean duration of symptoms before surgery was approximately 2 years (range, 8 months to 4 years). The mean follow-up duration was 17 months (range, 6-48 months).

Results
The average postoperative scores were 17 points on the Disabilities of the Arm, Shoulder and Hand outcome measure; 2 points on the visual analog scale at rest for 6 subjects (86%) with slight pain and 1 (14%) with moderate pain; and 78 on the Short Form 36 Health Survey. No significant complications were observed when the procedure was performed via arthroscopy.

Conclusion
Arthroscopic surgical treatment for medial epicondylitis of the elbow exhibits good outcomes and is safe and effective.

Lower Extremity

Arthroscopy

Endoscopic Gluteus Medius Repair With Concomitant Arthroscopy for Labral Tears: A Case Series With Minimum 5-Year Outcomes

Itay Perets, M.D., Yosif Mansor, M.D., Leslie C. Yuen, B.A., Austin W. Chen, M.D., Edwin O. Chaharbakhshi, B.S., Benjamin G. Domb, M.D.

Arthroscopy, December 2017, Volume 33, Issue 12, Pages 2159–2167

http://dx.doi.org/10.1016/j.arthro.2017.06.032

Purpose
To report the minimum 5-year outcomes of endoscopic gluteus medius repair for partial- and full-thickness tears with concomitant hip arthroscopy.

Methods
Data for all patients who underwent hip arthroscopy between February 2009 and September 2011 were prospectively collected. We included patients who underwent endoscopic gluteus medius repair with concomitant arthroscopic labral treatment and for whom the following measures were obtained preoperatively and at a minimum of 5 years' follow-up: modified Harris Hip Score, Non-Arthritic Hip Score, Hip Outcome Score–Sports Specific Subscale, and visual analog scale score for pain. For included patients, the International Hip Outcome Tool-12 (iHOT-12) score and satisfaction rating were also available at latest follow-up. Patients with at least 1 of the following criteria were excluded: preoperative Tönnis osteoarthritis grade of 2 or greater, previous hip conditions, severe dysplasia, and Workers' Compensation claims.

Results
There were 16 patients eligible for inclusion, 14 (87.5%) of whom had minimum 5-year follow-up, with a mean of 68.8 months (range, 60.1-79.6 months). The study group consisted of 13 women (92.9%) and 1 man (7.1%) with a mean age at surgery of 57.4 years (range, 46.3-74.8 years). Outcome scores improved as follows: modified Harris Hip Score, from 52.4 to 81.2 ($P = .004$); Non-Arthritic Hip Score, from 48.0 to 82.5 ($P = .002$); Hip Outcome Score–Sports Specific Subscale, from 30.1 to 66.4 ($P < .001$); and visual analog scale score, from 6.2 to 2.6 ($P = .001$). At minimum 5-year follow-up, the mean iHOT-12 score was 73.8 and the mean patient satisfaction rating was 8.4. Survivorship was 92.9%, with 1 patient who underwent conversion to total hip arthroplasty. There was no deterioration in patient outcomes and satisfaction between 2 and 5 years postoperatively. There were no clinical failures of gluteus medius repair and no complications.

Conclusions
Endoscopic gluteus medius repair with concomitant hip arthroscopy for labral tears is safe and shows favorable outcomes at minimum 5-year follow-up. Patient outcomes were as favorable at 5 years as they were at 2 years postoperatively.

Level of Evidence
Level IV, therapeutic case series.

BACK

The Effect of Intra-articular Cocktail Versus Femoral Nerve Block for Patients Undergoing Hip Arthroscopy

Sean Childs, M.D., Sonia Pyne, M.D., Kiritpaul Nandra, M.D., Wajeeh Bakhsh, M.D., S. Atif Mustafa, B.S., Brian D. Giordano, M.D.

Arthroscopy, December 2017, Volume 33, Issue 12, Pages 2170–2176

http://dx.doi.org/10.1016/j.arthro.2017.06.036

Purpose
To compare clinical efficacy and complication rate as measured by postoperative falls and development of peripheral neuritis between intra-articular blockade and femoral nerve block in patients undergoing arthroscopic hip surgery.

Methods
An institutional review board approved retrospective review was conducted on a consecutive series of patients who underwent elective arthroscopic hip surgery by a single surgeon, between November 2013 and April 2015. Subjects were stratified into 2 groups: patients who received a preoperative femoral nerve block for perioperative pain control, and patients who received an intra-articular “cocktail” injection postoperatively. Demographic data, perioperative pain scores, narcotic consumption, incidence of falls, and iatrogenic peripheral neuritis were collected for analysis. Postoperative data were then collected at routine clinical visits.

Results
A total of 193 patients were included in this study (65 males, 125 females). Of them, 105 patients received preoperative femoral nerve blocks and 88 patients received an intraoperative intra-articular “cocktail.” There were no significant differences in patient demographics, history of chronic pain (P = .35), worker's compensation (P = .24), preoperative pain scores (P = .69), or intraoperative doses of narcotics (P = .40). Patients who received preoperative femoral nerve blocks reported decreased pain during their time in PACU (P = .0001) and on hospital discharge (P = .28); however, there were no statistically significant differences in patient-reported pain scores at postoperative weeks 1 (P = .34), 3 (P = .64), and 6 (P = .70). Administration of an intra-articular block was associated with a significant reduction in the rate of postoperative falls (P = .009) and iatrogenic peripheral neuritis (P = .0001).

Conclusions
Preoperative femoral nerve blocks are associated with decreased immediate postoperative pain, whereas intraoperative intra-articular anesthetic injections provide effective postoperative pain control in patients undergoing arthroscopic hip surgery and result in a significant reduction in the rate of postoperative falls and iatrogenic peripheral neuritis.

Level of Evidence
Level III, retrospective comparative study.

BACK

Radiographic Tibial Tunnel Assessment After Anterior Cruciate Ligament Reconstruction Using Hamstring Tendon Autografts and Biocomposite Screws: A Prospective Study With 5-Year Follow-Up

Ioannis Karikis, M.D., Lars Ejerhed, M.D., Ph.D., Ninni Sernert, R.P.T., Ph.D., Lars Rostgård-Christensen, M.D., Jüri Kartus, M.D., Ph.D.

Arthroscopy, December 2017, Volume 33, Issue 12, Pages 2184–2194

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Purpose
To radiographically assess the tibial tunnel up to 5 years after anterior cruciate ligament (ACL) reconstruction using hamstring tendon autografts and biocomposite interference screws.

Methods
Fifty-one patients underwent anatomic single-bundle ACL reconstruction with metal interference screws in the femur and biocomposite interference screws in the tibia. Standardized digital radiographs with weight-bearing anteroposterior and lateral views of the index knee were taken in the early postoperative period and at 2 and 5 years postoperatively. Of 51 patients, 40 (78%) underwent radiographic assessment on all 3 occasions. Subjective and objective clinical assessments were obtained preoperatively and at the 5-year follow-up.

Results
The mean follow-up period was 65 months (±3.9 months), with a minimum of 59 months. The width of the tibial tunnel on the anteroposterior view was 9.4 mm (±1.4 mm) in the early postoperative period and 9.2 mm (±1.5 mm) at 5 years (P = .64). The corresponding widths on the lateral view were 9.6 mm (±1.5 mm) in the early postoperative period and 9.0 mm (±1.4 mm) at 5 years (P = .014). In 33 of 40 patients (83%) the width of the tibial tunnel had decreased on 1 or both views at 5 years compared with the early postoperative period. The study group had improved significantly at the 5-year follow-up compared with the preoperative assessments in terms of the KT-1000 arthrometer laxity tests (MEDmetric, San Diego, CA), pivot-shift test, Tegner activity scale, and Lysholm knee score (P < .001). No correlations were found between the tunnel widths and the KT-1000 assessment.

Conclusions
In 83% of patients, the width of the tibial tunnel had decreased on 1 or both radiographic views at 5 years compared with the early postoperative period after ACL reconstruction using biocomposite interference screws.

Level of Evidence
Level II, prospective study.

BACK

Outcome of Hamstring Autograft With Preserved Insertions Compared With Free Hamstring Autograft in Anterior Cruciate Ligament Surgery at 2-Year Follow-up

Ravi Gupta, M.S., D.N.B., F.R.C.S.(Glasg), F.A.M.S., F.I.M.S.A., Raj Bahadur, M.S., F.A.M.S., F.R.C.S., F.I.M.S.A., Anubhav Malhotra, M.B.B.S., Gladson David Masih, M.Sc., Munish Sood, D.N.B., Parmanand Gupta, M.S., Vivek Kumar Mathur, M.B.B.S., P.G.D.S.M.

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http://dx.doi.org/10.1016/j.arthro.2017.06.040

Purpose
To compare mechanical stability, functional outcome, and level of return to sports activity in patients undergoing anterior cruciate ligament (ACL) reconstruction with a free hamstring graft versus a graft with preserved insertions at 2-year follow-up.

Methods
This study was a prospective, single-blind (the evaluator was blinded), randomized trial of 110 adult professional athletes who were randomly allocated into 2 groups. Group 1 consisted of 55 patients who underwent ACL reconstruction with hamstring tendon autograft with preserved insertions (technique 1), and group 2 consisted of 55 patients who underwent ACL reconstruction with free hamstring tendon autograft (technique 2). An anteromedial portal was used for drilling of the femoral tunnel in all cases. Patients were assessed for a minimum follow-up of 2 years with clinical tests, the Activities of Daily Living Function Scale and Sports Function Scale (Cincinnati knee score), knee arthrometer (KT-1000) testing, and the Tegner activity scale.

Results
The average age of the patients was 27.0 ± 7.5 years in group 1 and 27.2 ± 5.7 years in group 2. At 24 months, the mean side-to-side difference by KT-1000 testing was 1.4 in group 1 and 2.2 in group 2 ($P < .0001$); the mean Cincinnati knee score (Activities of Daily Living Function Scale and Sports Function Scale) was 418.5 (median, 420; range, 400-420) and 406.8 (median, 420; range, 350-420), respectively ($P < .0001$); and the mean difference between the preinjury and postsurgery Tegner level of sports activity was 0.3 and 1.08, respectively ($P = .027$).

Conclusions
Although ACL reconstruction using hamstring autograft with preserved insertions resulted in statistically superior anterior stability, a better functional outcome, and a closer return to the preinjury level of sports activity as compared with free autograft, no clinically significant difference was proved.

Level of Evidence
Level I, randomized controlled trial.

BACK

Brake Reaction Time After Ankle and Subtalar Arthroscopy

Tinnart Sittapairoj, M.D., Chris A. Anthony, M.D., Chamnanni Rungprai, M.D., Yubo Gao, Ph.D., Alexej Barg, M.D., Phinit Phisitkul, M.D.

Arthroscopy, December 2017, Volume 33, Issue 12, Pages 2231–2237

http://dx.doi.org/10.1016/j.arthro.2017.08.245

Purpose
To evaluate preoperative and postoperative brake reaction time (BRT) of patients undergoing right-sided ankle or subtalar arthroscopy.

Methods
Patients who underwent right-sided ankle or subtalar arthroscopy were evaluated between May 2015 and February 2017. The inclusion criteria consisted of patients older than 18 years who possessed a valid driver's license, primarily drove vehicles that had automatic transmission, and used their right foot to depress the brake pedal. Patients were excluded if they had medical problems that precluded safe and legal driving. An automotive simulation device was used to calculate BRT from all participants. Each patient underwent testing on a computerized driving simulator preoperatively and then postoperatively at 2, 6, and 12 weeks or until their BRT was equal to or less than 0.7 seconds. BRT was defined as the time from stop stimulus until brake depression of 5%.

Results
The study enrolled 17 patients and 19 age-matched normal subjects. Patients showed an average BRT at 2 weeks postoperatively (0.57 ± 0.06 seconds) that was greater than the BRT in the control group (0.55 ± 0.06 seconds, $P = .84$) and lower than the patients' preoperative BRT (0.59 ± 0.06 seconds, $P = .08$). These BRTs were lower than the 0.70-second BRT threshold for safe driving in the United States.

Conclusions
The results of this study show that emergency BRT after right-sided ankle or subtalar arthroscopy improves by 2 weeks after surgery and is under the previously set benchmark of 0.7 seconds. In patients who undergo right-sided ankle or subtalar arthroscopic procedures, it is not unsafe to drive a vehicle at 2 weeks.

Level of Evidence
Level III, retrospective comparative study.

BACK

Optimizing Arthroscopy for Osteochondral Lesions of the Talus: The Effect of Ankle Positions and Distraction During Anterior and Posterior Arthroscopy in a Cadaveric Model

Phinit Phisitkul, M.D., Craig C. Akoh, M.D., Chamnanni Rungprai, M.D., Alexej Barg, M.D., Annuziato Amendola, M.D., Kevin Dibbern, M.S., Donald Anderson, Ph.D.

Arthroscopy, December 2017, Volume 33, Issue 12, Pages 2238–2245

http://dx.doi.org/10.1016/j.arthro.2017.06.027

Purpose
To quantify arthroscopic accessibility of the talar dome with predefined ankle positions through anterior and posterior approaches.

Methods
Fourteen below-knee cadaver specimens underwent preoperative range of motion assessments. A 30° 2.7-mm arthroscopic camera was used to mark accessible areas at varying ankle positions. Accessible regions were quantified using a surface laser scanner and digital 3 × 3 grid. Statistical analyses were performed to detect differences in arthroscopic accessibility between different flexion angles and noninvasive distraction.

Results
The mean arthroscopic accessibility of the talus was 58.5% and 49.8% for the anterior and posterior approaches, respectively ($P < .001$). During anterior arthroscopy, accessibility increased with up to 30° of plantarflexion ($P < .001$). There were no significant differences in accessibility between flexion groups for the posterior approach. There was significantly greater central zone accessibility for anterior arthroscopy (87.7%) when compared with posterior arthroscopy (74.3%; $P = .002$). Arthroscopic accessibility increased with increasing ankle distraction for both the anterior and posterior approaches (parameter estimates ± standard error): anterior = 6.5% ± 1.3%/mm of distraction, $P < .001$; and posterior = 7.0% ± 2.8%/mm, $P = .026$. Frequency analysis showed that the posterior third of the talus was completely inaccessible in 7 out of 14 of ankles during anterior arthroscopy. The anterior third of the talus during posterior arthroscopy was inaccessible in 11 out of 14 ankles during posterior arthroscopy.

Conclusions
Ankle plantarflexion up to 30° may be adequate for anterior arthroscopy for osteochondral lesions of the talus (OLTs). Noninvasive distraction also increases accessibility during both anterior and posterior arthroscopy. Anterior arthroscopy should be used for central third OLTs due to greater accessibility.

Clinical Relevance
Ankle positioning is an important consideration for anterior arthroscopy. Surgical approach used should match with the location of the OLTs.

BACK

Surgical Management of Deep Gluteal Syndrome Causing Sciatic Nerve Entrapment: A Systematic Review

Jeffrey Kay, M.D., Darren de SA, M.D., F.R.C.S.C., Laura Morrison, M.D.(Cand), Emily Fejtek, M.D.(Cand), Nicole Simunovic, M.Sc., Hal D. Martin, D.O., Olufemi R. Ayeni, M.D., M.Sc., F.R.C.S.C.

Arthroscopy, December 2017, Volume 33, Issue 12, Pages 2263–2278.e1

http://dx.doi.org/10.1016/j.arthro.2017.06.041

Purpose
To assess the causes, surgical indications, patient-reported clinical outcomes, and complications in patients with deep gluteal syndrome causing sciatic nerve entrapment.

Methods
Three databases (PubMed, Ovid [MEDLINE], and Embase) were searched by 2 reviewers independently from database inception until September 7, 2016. The inclusion criteria were studies reporting on both arthroscopic and open surgery and those with Level I to IV evidence. Systematic reviews, conference abstracts, book chapters, and technical reports with no outcome data were excluded. The methodologic quality of the studies was assessed with the MINORS (Methodological Index for Non-randomized Studies) tool.

Results
The search identified 1,539 studies, of which 28 (481 patients; mean age, 48 years) were included for assessment. Of the studies, 24 were graded as Level IV, 3 as Level III, and 1 as Level II. The most commonly identified causes were iatrogenic (30%), piriformis syndrome (26%), trauma (15%), and non-piriformis (hamstring, obturator internus) muscle pathology (14%). The decision to pursue surgical management was made based on clinical findings and diagnostic investigations alone in 50% of studies, whereas surgical release was attempted only after failed conservative management in the other 50%. Outcomes were positive, with an improvement in pain at final follow-up (mean, 23 months) reported in all 28 studies. The incidence of complications from these procedures was low: Fewer than 1% and 8% of open surgical procedures and 0% and fewer than 1% of endoscopic procedures resulted in major (deep wound infection) and minor complications, respectively.

Conclusions
Although most of the studies identified were case series and reports, the results consistently showed improvement in pain and a low incidence of complications, particularly for endoscopic procedures. These findings lend credence to surgical management as a viable option for buttock pain caused by deep gluteal syndrome and warrant further investigation.

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

BACK

Do Arthroscopic Fluid Pumps Display True Surgical Site Pressure During Hip Arthroscopy?

Jeremy A. Ross, M.D., Jennifer D. Marland, P.T., D.P.T., Brayden Payne, B.S., Daniel R. Whiting, M.D., Hugh S. West, M.D.

Arthroscopy, January 2018, Volume 34, Issue 1, Pages 126–132

http://dx.doi.org/10.1016/j.arthro.2017.08.290

Purpose
To report on the accuracy of 5 commercially available arthroscopic fluid pumps to measure fluid pressure at the surgical site during hip arthroscopy.

Methods
Patients undergoing hip arthroscopy for femoroacetabular impingement were block randomized to the use of 1 of 5 arthroscopic fluid pumps. A spinal needle inserted into the operative field was used to measure surgical site pressure. Displayed pump pressures and surgical site pressures were recorded at 30-second intervals for the duration of the case. Mean differences between displayed pump pressures and surgical site pressures were obtained for each pump group.

Results
Of the 5 pumps studied, 3 (Crossflow, 24K, and Continuous Wave III) reflected the operative field fluid pressure within 11 mm Hg of the pressure readout. In contrast, 2 of the 5 pumps (Double Pump RF and FMS/DUO+) showed a difference of greater than 59 mm Hg between the operative field fluid pressure and the pressure readout.

Conclusions
Joint-calibrated pumps more closely reflect true surgical site pressure than gravity-equivalent pumps. With a basic understanding of pump design, either type of pump can be used safely and efficiently. The risk of unfamiliarity with these differences is, on one end, the possibility of pump underperformance and, on the other, potentially dangerously high operating pressures.

Level of Evidence
Level II, prospective block-randomized study.

BACK

Central Acetabular Impingement Is Associated With Femoral Head and Ligamentum Teres Damage: A Cross-Sectional Matched-Pair Analysis of Patients Undergoing Hip Arthroscopy for Acetabular Labral Tears

Parth Lodhia, M.D., F.R.C.S.C., Chengcheng Gui, B.S.E., Timothy J. Martin, M.A., Sivashankar Chandrasekaran, M.B.B.S., F.R.A.C.S., Carlos Suarez-Ahedo, M.D., Benjamin G. Domb, M.D.

Arthroscopy, January 2018, Volume 34, Issue 1, Pages 135–143

http://dx.doi.org/10.1016/j.arthro.2017.08.254

Purpose
The primary purpose of this study was to report the prevalence of femoral head articular damage in patients with a central acetabular osteophyte (CAO) that was identified during hip arthroscopy and compare it with that in a matched control group without a CAO. A secondary purpose was to identify rates of coexisting intra-articular pathology in both patient groups.

Methods
Intraoperative data were collected prospectively on all hip arthroscopy patients at our institution between 2008 and 2015. The inclusion criteria for this study were CAOs identified during hip arthroscopy for a labral tear and/or femoroacetabular impingement. The exclusion criteria were Tönnis grade greater than 0, previous hip conditions, and prior surgical interventions. The matched control group was selected based on sex, age ± 5 years, body mass index, and Workers' Compensation claim at a 3:1 ratio and comprised patients who underwent hip arthroscopy for a labral tear and/or femoroacetabular impingement without a CAO. The size and location of labral tears and chondral lesions were recorded in square millimeters with a 5-mm probe and by the clock-face method.

Results
The CAO group consisted of 126 patients, who were matched to 378 patients in the control group. Femoral and acetabular chondral damage grades were significantly different between the 2 groups ($P < .001$). Of patients with CAOs, 55% had femoral head chondral damage compared with 24% of the control patients. The mean size of femoral chondral damage was 3.2 cm^2 in the CAO group and 1.7 cm^2 in the control group. The mean size of acetabular chondral damage was 1.7 cm^2 in the CAO group and 1.2 cm^2 in the control group. Both femoral and acetabular chondral damage sizes were significantly larger in the CAO group ($P \leq .007$). The prevalence of ligamentum teres tears was significantly different between the 2 groups ($P < .001$). There were no statistically significant differences in the types of labral tears between the 2 groups ($P = .625$).

Conclusions
This study showed that patients with CAOs had a significantly higher prevalence of femoral chondral damage and ligamentum teres tears than matched controls.

Level of Evidence
Level III, comparative study.

BACK

Arthroscopic Reconstruction of the Ligamentum Teres: A Guide to Safe Tunnel Placement

Alex W. Brady, M.Sc., Jorge Chahla, M.D., Ph.D., Renato Locks, M.D., Jacob D. Mikula, B.S., Erik L. Slette, B.A., Robert F. LaPrade, M.D., Ph.D., Marc J. Philippon, M.D.

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http://dx.doi.org/10.1016/j.arthro.2017.08.308

Purpose
To provide a quantitative guide to tunnel placement concurrently through the femur and acetabulum during a ligamentum teres reconstruction, minimizing the risk of injury to the obturator neurovascular bundle.

Methods
Nine human cadaveric pelvises, complete with femurs (mean age, 59.6 years; age range, 47-65 years), were studied. Before dissection, a 3-dimensional coordinate-measuring device was used to record the neutral orientation of the femur in the acetabulum. The specimens were then dissected free of all extra-articular soft tissue, except for the ligamentum teres and the obturator neurovascular bundle, and digitized. An anatomic femoral reconstruction tunnel through the femoral neck was simulated and extended along its axis into the acetabulum. The femur was digitally rotated internally from 0° to 30° and externally from 0° to 40°, as well as abducted from 0° to 30° and adducted from 0° to 20°, in increments of 1°. At each position, the location of the simulated acetabular reconstruction tunnel was measured with respect to the obturator bundle and the edge of the acetabular fossa.

Results
The anatomic reconstruction tunnel entered the lateral side of the femur at a mean distance of 7.0 mm distal and 5.8 mm anterior to the center of the vastus ridge. By angling the femur at 15° of internal rotation and 15° of abduction, the obturator neurovascular bundle was avoided in 100% of specimens.

Conclusions
The most important finding of this study was that a ligamentum teres reconstruction tunnel could be reamed through the femoral neck and safely positioned in the acetabulum by angling the femur at 15° of internal rotation and 15° of abduction.

Clinical Relevance
These quantitative descriptions of the ligamentum teres reconstruction tunnels can be used to guide arthroscopic surgical interventions designed to address ligamentum teres pathology.

BACK

Similar 30-Day Complications for Septic Knee Arthritis Treated With Arthrotomy or Arthroscopy: An American College of Surgeons National Surgical Quality Improvement Program Analysis

Patawut Bovonratwet, B.S., Stephen J. Nelson, M.D., Kirthi Bellamkonda, M.Sc., Nathaniel T. Ondeck, B.S., Blake N. Shultz, B.A., Michael J. Medvecky, M.D., Jonathan N. Grauer, M.D.

Arthroscopy, January 2018, Volume 34, Issue 1, Pages 213–219

http://dx.doi.org/10.1016/j.arthro.2017.06.046

Purpose
The purpose of the current study was to use the American College of Surgeons National Surgical Quality Improvement Program (NSQIP) to determine whether there were differences in 30-day perioperative complications between open arthrotomy and arthroscopy for the treatment of septic knees in a large national sample.

Methods
Patients who were diagnosed with a septic knee and underwent open arthrotomy or arthroscopy were identified in the 2005-2014 NSQIP data sets. Patient demographics and perioperative complications were characterized and compared between the 2 procedures.

Results
In total, 168 patients undergoing knee arthrotomy and 216 patients undergoing knee arthroscopy for septic knee were identified. There were no statistically significant differences in demographic variables between the 2 groups. On univariate analysis, the rate of minor adverse events (MAEs; 15.48% vs 8.80%, *P* = .043) was higher in the open arthrotomy treatment group, while the rate of serious adverse events (SAEs; 37.50% vs 26.19%, *P* = .019) was higher in the arthroscopic surgery treatment group. On multivariate analysis, which controlled for patient characteristics/comorbidities and used the Bonferroni correction for multiple comparisons, there were no statistically significant differences in risk of any adverse events (relative risk [RR] = 0.851; 99% confidence interval [CI], 0.598-1.211; *P* = .240), MAE (RR = 1.653; 99% CI, 0.818-3.341; *P* = .066), SAE (RR = 0.706; 99% CI, 0.471-1.058; *P* = .027), return to the operating room (RR = 0.810; 99% CI, 0.433-1.516; *P* = .387), or readmission (RR = 1.022; 99% CI, 0.456-2.294; *P* = .944) between open compared with arthroscopic surgery.

Conclusions
Univariate analysis revealed a lower rate of MAE but a higher rate of SAE in the arthroscopic surgery treatment group. However, on multivariate analysis, similar perioperative complications, rate of return to the operating room, and rate of readmission were found after open and arthroscopic debridement for septic knees. Based on the lack of demonstrated superiority of either of these 2 treatment modalities for this given diagnosis, and the expectation that most differences in perioperative complications for this diagnosis would have declared themselves within the first 30 days, deciding between the studied treatment modalities may be based more on other factors not included in this study.

Level of Evidence
Retrospective comparative study, Level III.

BACK

Outcomes After Double-Bundle Anterior Cruciate Ligament Reconstruction

Ji Hyun Ahn, M.D., Ho Won Kang, M.D., Kug Jin Choi, M.D.

Arthroscopy, January 2018, Volume 34, Issue 1, Pages 220–230

http://dx.doi.org/10.1016/j.arthro.2017.07.027

Purpose
To identify the risk factors predicting unsatisfactory postoperative clinical outcomes after double-bundle (DB) anterior cruciate ligament (ACL) reconstruction using multivariate logistic regression.

Methods
Inclusion criteria were consecutive DB ACL reconstructions from January 2006 to September 2012 with a minimum 3-year follow-up. Exclusion criteria included (1) a delay to surgery from initial injury of more than 4 years (210 weeks); (2) contralateral knee pathology; (3) the lack of postoperative 3-dimensional computed tomography; (4) single-bundle ACL reconstruction; (5) revision ACL reconstruction; (6) meniscus allograft transplantation after total or subtotal meniscectomy; (7) multiple ligament surgeries. According to the overall International Knee Documentation Committee (IKDC) rating at the last follow-up, we sorted all enrolled subjects into superior (IKDC grade A or B) and inferior outcome groups (IKDC grade C or D). Multivariate logistic regression was used to analyze risk factors, including age, gender, body mass index, time from injury to surgery, posterior tibial slope, notch width index, cartilage injury, meniscus injury, and femoral and tibial tunnel positions.

Results
In comparison between the superior outcome group (n = 240) and inferior outcome group (n = 50), anterior (adjusted odds ratio [OR]: 0.902, 95% confidence interval [CI]: 0.846-0.962) or distal (adjusted OR: 1.025, 95% CI: 1.006-1.060) femoral anteromedial tunnel position was a significant risk factor for the inferior outcomes. Partial meniscectomy of medial (adjusted OR: 49.002, 95% CI: 7.047-340.717) or lateral (adjusted OR: 14.974, 95% CI: 2.181-102.790) meniscus and delayed time from injury to surgery (adjusted OR: 1.062, 95% CI: 1.023-1.102) were also a significant predictor.

Conclusion
Anterior or distal anteromedial femoral tunnel position, partial meniscectomy of medial or lateral meniscus, and prolonged surgical delay of more than 11.5 weeks from injury were significant risk factors for the inferior clinical outcomes after DB ACL reconstruction.

Level of Evidence
Level III, retrospective therapeutic case series.

BACK

Endoscopic Treatment of Mid-Portion Achilles Tendinopathy: A Retrospective Case Series of Patient Satisfaction and Functional Outcome at a 2- to 8-Year Follow-up

Kim T.M. Opdam, M.D., Thomas P.A. Baltes, B.Sc., Ruben Zwiers, M.D., Jan Joost I. Wiegerinck, M.D., Ph.D., C. Niek van Dijk, M.D., Ph.D.

Arthroscopy, January 2018, Volume 34, Issue 1, Pages 264–269

http://dx.doi.org/10.1016/j.arthro.2017.06.035

Purpose
To evaluate the results of endoscopic treatment in patients affected by mid-portion Achilles tendinopathy, by release of the paratenon combined with a resection of the plantaris tendon, regarding patient satisfaction, functional outcome, and pain scores.

Methods
This retrospective study evaluated patients endoscopically treated for mid-portion Achilles tendinopathy between 2000 and 2013. Patient satisfaction, functional outcome, pain scores, and health-related quality of life were measured by the use of a numeric rating scale, the Foot and Ankle Outcome Score, the Victorian Institute of Sport assessment for the Achilles tendon, the numeric rating scale for pain during running and during sports, and the EuroQol 5D (EQ-5D-3L) standardized questionnaire. Additional questions were asked on the effectiveness of the treatment and sport participation.

Results
The response rate was 76.3% (45 of 59). Thirty-five (78%) patients were treated unilaterally and 10 (22%) patients were treated bilaterally. For the unilaterally treated patients, the median time to follow-up was 67 months (interquartile range [IQR] 48-99 months), and for the bilaterally treated patients, it was 89.5 months (IQR 37.5-161.75 months). The median satisfaction score for treatment results was 9 out of 10 (IQR 7-10) and 9.5 (IQR 7-10), respectively. The median Foot and Ankle Outcome Score subscales were scored 75 to 99 and 75 to 97, the median Victorian Institute of Sport assessment for the Achilles tendon scored 81 (IQR 47-90) and 97 (IQR 87-100), and the median numeric rating scale pain scores during both running and sports were 1 (IQR 0-6.5) for the unilaterally treated patients and 0 (IQR 0-4.5) and 0 (IQR 0-1) for the bilaterally treated patients, respectively. The median EQ-5D were 0.81 (IQR 0.71-1) and 1 (IQR 0.64-1), respectively. One reoperation for recurrence of symptoms was necessary.

Conclusions
This study shows high patient satisfaction and good functional outcomes in patients affected by mid-portion Achilles tendinopathy who were endoscopically treated by means of release of the paratenon in combination with transection of the plantaris tendon.

Level of Evidence
Level IV, retrospective case series (therapeutic).

BACK

Clinical Outcomes in Revision Anterior Cruciate Ligament Reconstruction: A Meta-analysis

Rohith Mohan, B.A., Kate E. Webster, Ph.D., Nick R. Johnson, B.S., Michael J. Stuart, M.D., Timothy E. Hewett, Ph.D., Aaron J. Krych, M.D.

Arthroscopy, January 2018, Volume 34, Issue 1, Pages 289–300

http://dx.doi.org/10.1016/j.arthro.2017.06.029

Purpose
The purpose of this meta-analysis was to determine overall objective graft failure rate, failure rate by graft type (allograft vs autograft reconstruction), instrumented laxity, and patient outcome scores following revision anterior cruciate ligament (ACL) reconstruction. Outcomes of interest were collected for all studies meeting the study inclusion criteria, but lower-level studies (level III/IV) were not pooled for quantitative synthesis due to high levels of heterogeneity in these study populations.

Methods
A comprehensive search strategy was performed to identify studies reporting outcomes of revision ACL reconstruction. The primary outcome reported was graft failure. A meta-analysis comparing rate of failure by graft type was conducted using a random effects model. Studies also reported patient clinical outcome scores, including International Knee Documentation Committee (IKDC), Lysholm, and knee injury and osteoarthritis outcome scores (KOOS) and graft laxity.

Results
Eight studies with 3,021 patients (56% male, 44% female) with an average age of 30 ± 4 years and mean follow-up time of 57 months were included. The overall objective failure rate was 6% (95% confidence interval [CI], 1.8%-12.3%). Mean instrumented laxity as side-to-side difference was 2.5 mm (95% CI, 1.9-3.1 mm). Mean IKDC subjective score was 76.99 (95% CI, 76.64-77.34), mean KOOS symptoms score was 76.73 (95% CI, 75.85-77.61), and mean Lysholm score was 86.18 (95% CI, 79.08-93.28). The proportion of patients with IKDC grade A or B was 85% (95% CI, 77%-91%). When the available data for failure rate were analyzed by graft type, autograft reconstruction had a failure rate of 4.1% (95% CI, 2.0%-6.9%), similar to allograft reconstruction at 3.6% (95% CI, 1.4%-6.7%).

Conclusions
In this meta-analysis, revision ACL reconstruction had failure rates similar to autograft or allograft reconstruction. Overall outcome scores for revision reconstruction have improved but appear modest when compared with primary ACL reconstruction surgery.

Level of Evidence
Meta-analysis of Level II studies, Level II.

BACK

Should the Capsule Be Repaired or Plicated After Hip Arthroscopy for Labral Tears Associated With Femoroacetabular Impingement or Instability? A Systematic Review

Victor Ortiz-Declet, M.D., Brian Mu, B.A., Austin W. Chen, M.D., Jody Litrenta, M.D., Itay Perets, M.D., Leslie C. Yuen, B.A., Benjamin G. Domb, M.D.

Arthroscopy, January 2018, Volume 34, Issue 1, Pages 303–318

http://dx.doi.org/10.1016/j.arthro.2017.06.030

Purpose
To critically evaluate the existing literature on hip capsule biomechanics, clinical evidence of instability, and outcomes of capsular management to answer the following question: Should the capsule be repaired or plicated after hip arthroscopy for labral tears associated with femoroacetabular impingement or instability?

Methods
We used PRISMA (Preferred Reporting Items for Systematic Reviews and Meta-analyses) guidelines to find articles using PubMed and Embase. Included studies were Level I through V studies and focused on hip capsule biomechanics, postarthroscopic instability, and clinical outcomes. Articles were excluded if they discussed treatment of the hip capsule during arthroplasty, dislocations without a history of arthroscopy, and pre-existing conditions. The Methodological Index for Non-randomized Studies (MINORS) was used for quality assessment of clinical outcome studies.

Results
A total of 34 articles were included: 15 biomechanical studies, 9 instability case reports, and 10 outcome studies. There is consensus from biomechanical studies that the capsule is an important stabilizer of the hip and repairing it provides better stability than when unrepaired. Case reports of instability have raised concerns about capsular management during the index procedure to decrease the complications associated with this problem. Furthermore, outcome studies suggest that there may be an advantage of capsular closure versus capsulotomy during hip arthroscopy for nonarthritic patients.

Conclusions
Short-term outcome studies suggest that capsular closure is safe and effective in nonarthritic patients undergoing hip arthroscopic procedures and may yield superior outcomes compared with unrepaired capsulotomy. Moreover, biomechanical evidence strongly supports the role of capsular repair in maintaining stability of the hip. In patients with stiffness or inflammatory hip disorders, a release may be appropriate. In patients who have signs and symptoms of instability, there is existing evidence that capsular plication may be associated with significant improvement in patient-reported outcomes. Although the multiple procedures performed in combination with capsular treatment present confounding variables, current evidence appears to support routine capsular closure in most cases and to support capsular plication in cases of instability or borderline dysplasia.

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

BACK

Venous Thromboembolism Events After Hip Arthroscopy: A Systematic Review

Chloe E. Haldane, M.D.(Cand), Seper Ekhtiari, M.D., Darren de Sa, M.D., F.R.C.S.C., Nicole Simunovic, M.Sc., Marc Safran, M.D., Filippo Randelli, M.D., Andrew Duong, M.Sc., Forough Farrokhyar, M.Phil., Ph.D., Olufemi R. Ayeni, M.D., M.Sc., F.R.C.S.C.

Arthroscopy, January 2018, Volume 34, Pages 321–330.e1

http://dx.doi.org/10.1016/j.arthro.2017.07.006

Purpose
The purpose of this systematic literature review focused on hip arthroscopy was to (1) report the venous thromboembolism (VTE) event incidence in patients who receive VTE prophylaxis and those who do not, (2) report how VTE prophylaxis is currently being administered, and (3) report operative and patient-related risk factors for VTE identified in the literature.

Methods
The electronic databases MEDLINE, Embase, and PubMed were searched from database inception to October 10, 2016, and screened in duplicate for relevant studies. Data were collected regarding VTE prophylaxis, traction use, surgical time, VTE incidence, patient and operative factors, and postoperative weight bearing and rehabilitation. Study quality was assessed in duplicate with the Methodological Index for Non-Randomized Studies criteria.

Results
Outcome analyses included 14 studies that involved 2,850 patients (2,985 hips). The weighted mean follow-up period was 19 ± 8 months, ranging from 7 days to 103 months. The weighted mean age was 40.7 ± 7 years, ranging from 6 to 82 years, and 39.6% of patients were male patients. The overall weighted proportion of VTE events after hip arthroscopy found in 14 included studies was 2.0% (95% confidence interval, 0.01%-4.1%), with 25 VTE events. Several studies reported patient risk factors, which included increased age, increased body mass index, prolonged traction time, and use of oral contraceptives.

Conclusions
The use and efficacy of VTE prophylaxis are highly under-reported within hip arthroscopy. The low incidence of VTE events found in this review (2.0%) suggests that prophylaxis may not be necessary in low-risk patients undergoing hip arthroscopy; however, the true rate may be under-reported. Current literature suggests that prophylaxis is typically not prescribed. Early mobility and postoperative rehabilitation may also help to further mitigate the risk of VTE events, but use of these strategies needs further prospective evaluation.

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

BACK

The American Journal of Sports Medicine

Hip Arthroscopy for Femoroacetabular Impingement in a Military Population

Darren D. Thomas, MD, LCDR, MC, USN, Andrew S. Bernhardson, MD, LCDR, MC, USN†, Ethan Bernstein, MD, LT, MC, USN, Christopher B. Dewing, MD, CDR, MC, USN

The American Journal of Sports Medicine Vol 45, Issue 14, 2017; pp. 3298–3304

http://journals.sagepub.com/doi/full/10.1177/0363546517726984

Background:
Femoroacetabular impingement (FAI) can lead to hip pain and early joint degeneration. There have been few reports to date on the outcomes of hip arthroscopy for the treatment of FAI in the military population.

Purpose/Hypothesis:
The purpose of this study was to compare patient demographics with postoperative outcomes after hip arthroscopy for symptomatic FAI and to identify preoperative risk factors for poor outcomes. The hypothesis was that certain preoperative patient characteristics will be predictive of poorer outcomes and that lower outcomes scores will be associated with a higher likelihood of medical separation from the military.

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

Methods:
Retrospective chart review of active-duty and dependent patients older than 18 years who underwent hip arthroscopy for symptomatic FAI from 2009 to 2014 at a single institution.

Results:
A total of 469 (309 males and 160 females) surgeries were performed on 456 active-duty personnel and 13 dependent civilians, with a mean 2.5-year follow-up. Overall, 39% (n = 179) were able to return to duty (RTD), 18% (n = 82) were medically cleared to return to normal daily activities but did not remain on active duty, and 43% (n = 195) required referral to the Disability Evaluation System (DES). Increasing rank and male sex were positive predictors and Axis 1 psychiatric diagnosis, revision surgery, concomitant psoas tenotomy, multiple medical comorbidities, and complaints of generalized pelvic pain were negative predictors for returning to duty. US Marine Infantry and Special Forces showed improved RTD rates (50%-86%) compared with administrative, more sedentary, occupations (22%). On average, Single Alpha Numeric Evaluation (SANE) and visual analog scale (VAS) scores improved after surgery, with SANE scores improving 37 ± 28 points and VAS scores improving 2.6 ± 2.5 points. The mean postoperative SANE and VAS scores differed significantly between the RTD group and those not returning to duty; 87 and 1.2 points compared with 69 and 3.6 points, respectively ($P < .0001$).

Conclusion:
Hip arthroscopy for the treatment of symptomatic FAI effectively improves pain symptoms and self-reported overall function but shows a much lower than expected return to full, unrestricted active duty in the general active-duty military population. Underlying psychiatric diagnoses, female sex, and more sedentary occupations are associated with lower RTD rates. Furthermore, lower postoperative SANE and VAS scores are associated with lower RTD rates. Only the more active and elite components of the military study population showed RTD rates consistent with previously reported outcomes of return to competitive sports after hip arthroscopy for FAI.

BACK

Journal of Bone and Joint Surgery

Quantitative Assessment of Femoral Head Perfusion Following Arthroscopic Femoral Osteochondroplasty: A Cadaveric Study

Lazaro, Lionel E. MD[1,2]; Nawabi, Danyal H. MD[1,2]; Klinger, Craig E. BA[1,2]; Sculco, Peter K. MD[1,2]; van der List, Jelle P. MD[1,2]; Dyke, Jonathan P. PhD[2]; Helfet, David L. MD[1,2,a]; Kelly, Bryan T. MD[1,2]; Lorich, Dean G. MD[1,2]

JBJS: December 20, 2017 - Volume 99 - Issue 24 - p 2094–2102

http://journals.lww.com/jbjsjournal/Abstract/2017/12200/Quantitative_Assessment_of_Femoral_Head_Perfusion.6.aspx

Background:
Disruption of the arterial supply to the femoral head, and subsequent development of femoral head osteonecrosis, is of serious concern with intracapsular hip procedures. However, the effect of arthroscopic femoral osteochondroplasty on femoral head perfusion is unknown. We aimed to quantify the effects of both standard and posterosuperior extension of arthroscopic femoral osteochondroplasty on femoral head vascularity. We hypothesized that extension of the superior resection zone posteriorly would negatively affect femoral head perfusion.

Methods:
In 12 cadaveric pelvic specimens, we cannulated the medial femoral circumflex artery (MFCA). One hip per pelvis was randomly selected to be in 1 of 2 experimental groups based on the superior extent of the osteochondroplasty: standard resection (resection anterior to the 12 o'clock [0° of 360°] position) or extended resection (resection extended posterior to the 12 o'clock position). Computed tomography (CT) scans were obtained prior to and following arthroscopic resection to delineate the resection margins. Gadolinium enhancement on magnetic resonance imaging (MRI) was quantified in the femoral head by volumetric analysis using custom software. A polyurethane compound was injected and gross dissection of the vasculature was performed.

Results:
Extension of the osteochondroplasty posteriorly (the extended-resection group), to a mean of 41.3° (range, 34° to 47°) posterior to the 12 o'clock position, decreased femoral head perfusion by a mean of 28% (range, 18% to 38%). The standard-resection group demonstrated a mean decrease in femoral head perfusion of 7% (range, 4% to 11%). Correlation analysis demonstrated a significant negative correlation (correlation coefficient, −0.877; $p < 0.001$; $R^2 = 0.747$). For every 1° that the superior resection margin extended posteriorly, a corresponding 0.88% decrease in femoral head perfusion was found.

Conclusions:
Femoral head perfusion is almost fully maintained with arthroscopic osteochondroplasty when the superior resection margin is anterior to the 12 o'clock position. Perfusion is also well maintained if the superior resection margin is extended no more than 10° posterior to 12 o'clock. Further posterior extension correlated with greater decreases in femoral head perfusion.

Clinical Relevance:
Our study provides previously unreported quantitative MRI data on femoral head perfusion following arthroscopic femoral osteochondroplasty for the treatment of cam-type femoroacetabular impingement.

BACK

Who Is Performing Hip Arthroscopy?: An Analysis of the American Board of Orthopaedic Surgery Part-II Database

Duchman, Kyle R. MD[1,a]; Westermann, Robert W. MD[1]; Glass, Natalie A. PhD[1]; Bedard, Nicholas A. MD[1]; Mather, Richard C. III MD, MBA[2]; Amendola, Annunziato MD[2]

JBJS: December 20, 2017 - Volume 99 - Issue 24 - p 2103–2109

http://journals.lww.com/jbjsjournal/Abstract/2017/12200/Who_Is_Performing_Hip_Arthroscopy___An_Analysis_of.7.aspx

Background:
Hip arthroscopy utilization has increased dramatically over the last decade. However, the lack of a formal training curriculum raises concern that inconsistent technical performance may be an issue for early-career hip arthroscopists. The purpose of the present study was to investigate hip arthroscopy utilization by early-career orthopaedic surgeons while focusing on fellowship training status to better guide future development of a hip arthroscopy training curriculum.

Methods:
The American Board of Orthopaedic Surgery (ABOS) Part-II database was used to identify candidates who had performed ≥1 hip arthroscopy procedures between 2006 and 2015. Procedures were categorized using Common Procedural Terminology (CPT) codes, and candidates were categorized by fellowship training experience. Trends in hip arthroscopy utilization were evaluated using univariate and regression analyses while stratifying by fellowship training experience.

Results:
Overall, 9.2% (643) of 6,987 ABOS candidates had performed ≥1 hip arthroscopy procedures. Over the study period, both the proportion of candidates performing hip arthroscopy and the proportion of hip arthroscopy procedures performed (relative to all procedures performed, of any type) increased ($p < 0.001$). Candidates performing hip arthroscopy most frequently reported sports medicine fellowship training (74.5%; 479 of 643). Also, among the candidates who performed hip arthroscopy, the proportion who had sports medicine fellowship training increased over the study period ($p = 0.001$). The majority of candidates performing hip arthroscopy (67.2%; 432 of 643) performed ≤5 hip arthroscopy procedures, while a small number of high-volume hip arthroscopists (6.5%; 42 of 643) performed 34.6% (1,403 of 4,054) of all hip arthroscopy procedures.

Conclusions:
The increase in hip arthroscopy utilization in this cohort appears to have been driven primarily by the increased number of candidates performing hip arthroscopy and less by an increasing number of hip arthroscopy procedures being performed by individual candidates. The majority of candidates performing hip arthroscopy were sports-medicine-fellowship trained. This information is valuable for both trainees and educators interested in improving education and defining a curriculum for future hip arthroscopy training.

BACK

Prior Generic Arthroscopic Volume Correlates with Hip Arthroscopic Proficiency: A Simulator Study

Erturan, Gurhan MBBS, MRCS, MSc[1,a]; Alvand, Abtin BSc, MBBS, PhD, FRCS(Tr&Orth)[1]; Judge, Andrew BSc, MSc, PhD[1]; Pollard, Thomas C.B. MD, FRCS(Tr&Orth)[2]; Glyn-Jones, Sion MA, DPhil, FRCS(Tr&Orth)[1]; Rees, Jonathan L. MD, FRCS(Tr&Orth)[1]

JBJS: January 3, 2018 - Volume 100 - Issue 1 - p e3

https://journals.lww.com/jbjsjournal/Abstract/2018/01030/Prior_Generic_Arthroscopic_Volume_Correlates_with.14.aspx

Background:
Changing trends in surgical education and patient expectation are leading to proficiency models of progression and the use of simulators. Hip arthroscopy is increasingly performed and has a steep learning curve mainly addressed during fellowship training. The aim of this study was to assess the impact of previous generic arthroscopic experience on performance at a simulated hip arthroscopy task to both estimate the minimum case numbers that correlate with expert proficiency levels and help to guide selection for hip arthroscopy fellowships.

Methods:
Fifty-two participants were recruited to a cross-sectional study. Four consultants (expert hip arthroscopists), 28 trainees (residents and fellows), and 20 novices (interns and medical students) performed a standardized bench-top simulated hip arthroscopy task. A validated global rating scale (GRS) score and motion analysis were used to assess surgical performance. Prior arthroscopic experience was recorded from surgical electronic logbooks. Receiver operating characteristic (ROC) curve analyses were conducted to identify optimum cut-points for task proficiency at both expert and competent GRS levels.

Results:
here were significant differences ($p < 0.05$) between the arthroscopic ability of all experience groups based on GRS assessment and for all motion analysis metrics. There was a significant positive correlation between logbook numbers and GRS scores ($p < 0.0001$). ROC curve analysis demonstrated that a minimum of 610 prior arthroscopic procedures were necessary to achieve an expert GRS score, and 78 prior arthroscopic procedures were necessary for a competent score.

Conclusions:
Performing a basic hip arthroscopy task competently requires substantial previous generic arthroscopic experience. The numbers identified in this study provide targets for residents. Program directors appointing to hip arthroscopy fellowship training posts may find these results useful as a guide during the selection process.

BACK

MRI Evaluation of Repaired Versus Unrepaired Interportal Capsulotomy in Simultaneous Bilateral Hip Arthroscopy: A Double-Blind, Randomized Controlled Trial

Strickland, Colin D. MD[1]; Kraeutler, Matthew J. MD[2]; Brick, Matthew J. MBChB, FRACS[3]; Garabekyan, Tigran MD[4]; Woon, Jason T.K. BBioMedSc(Hons)[5]; Chadayammuri, Vivek MD[6]; Mei-Dan, Omer MD[1,a]

JBJS: January 17, 2018 - Volume 100 - Issue 2 - p 91–98

https://journals.lww.com/jbjsjournal/Abstract/2018/01170/MRI_Evaluation_of_Repaired_Versus_Unrepaired.1.aspx

Background:
Techniques used in hip arthroscopy continue to evolve, and controversy surrounds the need for capsular repair following this surgical intervention. The purpose of this study was to evaluate the magnetic resonance imaging (MRI) appearance of the hip capsule in patients with femoroacetabular impingement (FAI) who underwent simultaneous bilateral hip arthroscopy through an interportal capsulotomy with each hip randomized to undergo capsular repair or not undergo such a repair.

Methods:
This double-blind, randomized controlled trial included 15 patients (30 hips), with a mean age of 29.2 years, who underwent simultaneous bilateral hip arthroscopy utilizing a small (<3-cm) interportal capsulotomy for the treatment of FAI. The first hip treated in each patient was intraoperatively randomized to undergo capsular repair or no capsular repair. The contralateral hip then received the opposite treatment. MRI was performed at 6 and 24 weeks postoperatively, and the scans were analyzed by 2 musculoskeletal radiologists. The patients and the radiologists were blinded to the treatment performed on each hip. Capsular dimensions were measured at the level of the healing capsulotomy site and, for hips with a persistent defect, at locations both proximal and distal to the defect. These values were then analyzed at both time points to assess the rate and extent of capsular healing.

Results:
At 6 weeks postoperatively, a continuous hip capsule (with no apparent capsulotomy defect) was observed in 8 hips treated with capsular repair and 3 hips without such a repair. Of the 19 hips with a discontinuous capsule at 6 weeks, 17 were available for follow-up at 24 weeks postoperatively; all 17 demonstrated progression to healing, with a contiguous appearance without defects and no difference in capsular dimensions between treatment cohorts.

Conclusions:
Arthroscopic repair of a small interportal hip capsulotomy site yields an insignificant increase in the percentage of continuous hip capsules seen on MRI at 6 weeks postoperatively compared with no repair. Repaired and unrepaired capsulotomy sites progressed to healing with a contiguous appearance on MRI by 24 weeks postoperatively.

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

BACK

Bone and Joint Journal

Complications following arthroscopic surgery of the hip : a systematic review of 36 761 cases

N. Nakano, L. Lisenda, T. L. Jones, D. T. Loveday, V. Khanduja

Bone Joint J 2017;99-B:1577–83.

http://bjj.boneandjoint.org.uk/content/99-B/12/1577

Aims:
The number of patients undergoing arthroscopic surgery of the hip has increased significantly during the past decade. It has now become an established technique for the treatment of many intra- and extra-articular conditions affecting the hip. However, it has a steep learning curve and is not without the risk of complications. The purpose of this systematic review was to determine the prevalence of complications during and following this procedure.

Materials and Methods:
Preferred Reporting Items for Systematic Reviews and Meta-Analyses guidelines were used in designing this study. Two reviewers systematically searched the literature for complications related to arthroscopy of the hip. The research question and eligibility criteria were established a priori. Pertinent data were abstracted and analysed.

Results:
We found 276 relevant studies with a total of 36 761 arthroscopies that met the inclusion criteria. The mean age of the patients was 36.7 years (1.7 to 70) and the mean body mass index was 25.7 kg/m2 (20.2 to 29.2). Femoroacetabular impingement and labral tears were the most common indications for the procedure. The total number of complications was 1222 (3.3%). Nerve injury (0.9%), mainly involving the pudendal and lateral femoral cutaneous nerves, and iatrogenic chondral and labral injury (0.7%), were the two most common complications. There were 58 major complications (0.2%), the most common being intra-abdominal extravasation of fluid, which was found in 13 cases (0.04%). There were three deaths (0.008%).

Conclusion:
Arthroscopic surgery of the hip is a procedure with a relatively low rate of complications, although some may be significant in this young cohort of patients. This study relied on the reported complications only and the results should be interpreted with caution.

BACK

Knee Surgery, Sports Traumatology, Arthroscopy

Sports-specific differences in postsurgical infections after arthroscopically assisted anterior cruciate ligament reconstruction

Werner Krutsch, Johannes Zellner, Florian Zeman, Michael Nerlich, Matthias Koch, Christian Pfeifer, Peter Angele

December 2017, Volume 25, Issue 12, pp 3878–3883

https://link.springer.com/article/10.1007/s00167-016-4385-6

Purpose
Post-operative infection after arthroscopically assisted anterior cruciate ligament (ACL) reconstruction is a rare but severe complication, particularly for young and active patients. It is unclear whether the prevalence of knee infection is correlated with the type of sports or the level of performance.

Methods
From 2008 to 2012, the internal single-centre ACL registry of the FIFA Medical Centre of Excellence Regensburg was retrospectively screened for sex, age, time between isolated primary ACL rupture and surgery, surgical technique, rate of infection after ACL reconstruction and the type of sports practised.

Results
In total, 4801 ACL reconstructions had been conducted over 5 years, 4579 in amateur and 221 in professional athletes. After application of the exclusion criteria, 1809 athletes with ACL reconstruction were analysed regarding postsurgical infection and the type of sports practised. Professionals and amateurs did not significantly differ with regard to infection rates (n.s.) but in the timing of ACL repair ($p < 0.001$). Eleven of 1130 football players had developed postsurgical infection after ACL reconstruction (1.0%) in contrast to 557 skiers and snowboarders without infection ($p = 0.02$). The timing of ACL repair did not differ between the different types of sports (n.s.). Staphylococcus aureus and epidermidis were the predominant detected bacteria. All patients were hospitalised and successfully treated with arthroscopic lavage and antibiotic medication.

Conclusion
ACL infections showed sports-related differences. Athletes practising summer outdoor sports such as football had a significantly higher risk of infection after ACL reconstruction than winter sports athletes. No difference was found between professional and amateur athletes. Relevant prevention strategies for postsurgical ACL infections should consider influencing patient factors such as the type of sports activity and attendant circumstances.

Level of evidence:
III.

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Miscellaneous
Knee Surgery, Sports Traumatology, Arthroscopy

The German Arthroscopy Registry (DART)

Ralf Mueller-Rath, Oliver Miltne, Alfred Hochrein, Philipp Niemeyer

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In Germany, more than 400,000 arthroscopic procedures are performed each year. The DART registry is designed to study the outcome of arthroscopic procedures of the shoulder, hip, knee and ankle joint under everyday clinical circumstances using patient-reported outcome measures (PROMs). DART aims at identifying patient-specific factors correlated with therapy-associated complications and treatment failure and will help study the influence of concurrent joint diseases and procedures. To achieve these tasks, a Web-based remote data entry system will be applied and adapted to the needs of DART. DART will consist of a physician's and a patient's form to enter data on the specific disease, surgical procedure, joint-specific outcome, disability and quality of life measured by validated scores up to 5 years following surgery. The pool of data will be subjected to further clinical investigations and subgroup analysis. Individual results will be made accessible to the surgeon and the patient. Moreover, public reports will be generated to provide healthcare authorities and insurance companies with information on the effectiveness of arthroscopic surgery. The aim of this article is to present the methodology of the registry.

Level of evidence *V.*

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