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Issue 131.3 Arthroscopy, July 2025

Nederlandse Vereniging voor Arthroscopie

Website www.4b.4abstracts.nl

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Upper extremity

Arthroscopy, Volume 41, Issue 7

Statin Use Not Linked to Rotator Cuff Retear After Arthroscopic Rotator Cuff Repair

K. Yamakado

DOI: https://doi.org/10.1016/j.arthro.2024.11.066

Purpose: To evaluate the risk factors, including hyperlipidemia and statin use, on rotator cuff healing after arthroscopic repair.

Methods: A retrospective review of prospectively collected cases who underwent arthroscopic rotator cuff repair was conducted. Total cholesterol, low-density lipoprotein, triglycerides levels, and the presence or absence of statin use and type of statins used (type 1 naturally derived statins and type 2 synthetic statins) were reviewed. Repair integrity was determined according to the Sugaya classification, assessed by magnetic resonance imaging (types 4 and 5 were considered retear). Including serum lipid levels and statin use, potential risk factors for retear were tested using multivariate logistic regression.

Results: Six hundred twenty cases were evaluated. The mean age was 66.9 years; 348 were male, and 272 were female. The overall retear rate was 16.1%. There was no statistically significant difference in serum lipid levels among the categories of the Sugaya classification. Multivariate logistic regression analysis showed no association between serum lipid levels and odds ratio for retear: total cholesterol (odds ratio [OR] 1.00; P = .72), low-density lipoprotein (OR 0.99; P = .44), and triglycerides (OR 1.00; P = .88). Statins did not have a statistically significant increase or decrease in odds: type 1 statin (OR 0.3; P = .061) and type 2 statin (OR 1.4; P = .26). Older age (OR 1.1; P < .0001), male sex (OR 1.8; P = .021), and large-to-massive cuff tear size (OR 3.4; P < .0001) were significant risk factors.

Conclusions: No association was found between serum lipid levels and retear after arthroscopic rotator cuff repair. Statin use was not a statistically significant factor for retears, but different trends were seen for type 1 and type 2 statins. Older age, male sex, and large to massive tears were significant risks for retears.

Level of Evidence: Level III, retrospective cohort design, prognosis study.

BACK

Arthroscopic Partial Repair of Large to Massive Rotator Cuff Tears Shows Clinical Outcomes and Survivorship at Minimum 10-Year Follow-Up Comparable to Those of Arthroscopic Complete Repair

Y.J. Lee, D.H. Kim,

DOI: https://doi.org/10.1016/j.arthro.2024.11.067

Purpose: To compare the survival rate (revision surgery) and clinical and radiologic outcomes of arthroscopic partial versus complete repair for large to massive rotator cuff tears over a minimum 10-year follow-up period.

Methods: We conducted a retrospective analysis of patients who underwent arthroscopic partial or complete repair of large to massive rotator cuff tears between 2008 and 2013, with minimum 10-year follow-up. Functional outcomes were measured using the visual analog scale pain score, Subjective Shoulder Value, American Shoulder and Elbow Surgeons score, University of California, Los Angeles shoulder score, and passive range of motion preoperatively and at the last follow-up. Failure was defined as the need for revision surgery (reverse shoulder arthroplasty) owing to significant pain and functional loss. Radiographic assessments included radiography (preoperatively and at the latest follow-up) and magnetic resonance arthrography (preoperatively and at 6 months postoperatively). The groups were compared regarding subjective and objective outcomes.

Results: The study included 90 participants, 34 in the partial repair group (group P) and 56 in the complete repair group (group C). At the latest follow-up, no significant differences in clinical scores were found and the percentage of participants exceeding the minimal clinically important difference was comparable in both groups for all variables. Groups P and C showed forward flexion of 133° ± 7° and 136° ± 10°, respectively (P = .319); external rotation of 41° ± 5° and 42° ± 6°, respectively (P = .465); and internal rotation of 11 ± 1 and 11 ± 2, respectively (P = .284). Despite differences in retear size at 6 months (P < .001) and acromiohumeral distance at the latest follow-up (4.5 ± 1.1 mm in group P vs 5.8 ± 0.7 mm in group C), the survival rates at 10 years were similar: 77% (n = 8) in group P and 84% (n = 11) in group C (P = .674).

Conclusions: Although radiologic outcomes were inferior in the partial repair group, both groups had comparable survival rates and clinical outcomes over the 10-year follow-up period.

Level of Evidence: Level III, retrospective comparative study.

BACK

The Incidence of Popeye Deformity After Soft-Tissue Biceps Tenodesis Is Comparable to Biceps Anchor Tenodesis and Lower Than Biceps Tenotomy During Arthroscopic Rotator Cuff Repair

H.G. Kim, S.C. Kim

DOI: https://doi.org/10.1016/j.arthro.2024.11.069

Purpose: To compare clinical and radiologic outcomes between biceps anchor tenodesis (AT), biceps soft-tissue tenodesis (ST), and biceps tenotomy (TT) for patients with concomitant rotator cuff repair (RCR).

Methods: This retrospective study reviewed patients who underwent arthroscopic RCR for full-thickness rotator cuff tears with AT, ST, or TT with minimum 2-year follow-up. All biceps procedures were performed arthroscopically, and ST consisted of fixation to the transverse humeral ligament. We excluded massive rotator cuff tears, additional biceps procedures, and revisions. Patient-reported outcome measures (PROMs) (visual analog scale [VAS] pain score, VAS functional score, American Shoulder and Elbow Surgeons score, and Constant score) and elbow flexion (EF) strength were evaluated preoperatively and at final follow-up.

Results: A total of 155 patients (50 AT, 52 ST, and 53 TT patients) were included in this study. The AT group was younger (mean age, 58.7 ± 6.3 years in AT group, 67.6 ± 5.0 years in ST group, and 66.1 ± 5.3 years in TT group) and had a lower proportion of female patients (13 [26.0%] in AT group, 31 [59.6%] in ST group, 39 [73.6%] in TT group) than the ST and TT groups (all $P < .001$). At final follow-up, PROM scores were significantly improved in all 3 groups (all $P < .001$). The VAS pain score ($P = .134$), VAS functional score ($P = .616$), and American Shoulder and Elbow Surgeons score ($P = .093$) at final follow-up showed no significant differences between the 3 groups. The Constant score and EF strength were significantly higher in the AT group than in the ST and TT groups preoperatively ($P = .009$ for Constant score, $P = .033$ for EF strength) and at final follow-up ($P < .001$ for Constant score, $P < .001$ for EF strength). There was no significant difference in mean improvement in PROM scores and EF strength or in the proportion of achievement of the minimal clinically important difference. The incidence of Popeye deformity was significantly higher in the TT group (n = 11, 20.8%) than in the AT group (n = 3, 5.8%) and ST group (n = 4, 8.0%) ($P = .035$). Regression analysis showed that TT (odds ratio, 15.6; $P < .001$) and male sex (odds ratio, 103.9; $P < .001$) were associated with Popeye deformity and that ST (coefficient, –0.51; $P = .035$) was associated with bicipital groove pain.

Conclusions: Biceps AT, ST, and TT during arthroscopic RCR showed good clinical outcomes. Although there was a possibility of selection bias, there was no significant difference in mean improvement in clinical outcomes between the 3 long head of the biceps tendon procedures. The incidence of Popeye deformity was higher in the TT group, and that of biceps groove pain was higher in the ST group.

Level of Evidence: Level III, retrospective cohort study.

BACK

Perioperative Losartan Is Associated With Similar Rates of Additional Surgical Procedures for Postoperative Shoulder Stiffness After Primary Arthroscopic Rotator Cuff Repair but Lower Rates of Secondary Debridement and Repair

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DOI: https://doi.org/10.1016/j.arthro.2024.11.084

Purpose: To compare the rate of additional shoulder surgery related to postoperative stiffness or tendon healing after primary rotator cuff repair between patients with a losartan prescription and without a losartan prescription.

Methods: The International Classification of Diseases, Tenth Revision, code M75.1 was used to identify all patients in the TriNetX Research Network with a rotator cuff tear diagnosis who underwent arthroscopic rotator cuff repair between January 1, 2015, and December 31, 2021. Patients were stratified into the losartan group (LG) and nonlosartan group (NLG) on the basis of whether they had a coded prescription for losartan within 1 year before surgery or 3 months after surgery. The 2 cohorts were propensity scored and matched to reduce confounding biases. Specifically, cohorts were matched on the basis of age, gender, obesity, nicotine use, hyperlipidemia, diabetes, hypertensive diseases, ischemic heart disease, heart failure and valvular disease, and peripheral arterial disease. The incidence of additional shoulder surgeries associated with stiffness and rotator cuff healing was analyzed and compared at 1-year and 2-year time points.

Results: After propensity score matching, both the LG and NLG contained 3,970 patients. There was no difference in the rate of lysis of adhesions or manipulation under anesthesia at 1-or 2-year postoperatively between patients in the LG and LG. Patients in the LG were less likely undergo arthroscopic debridement (odds ratio 0.71; confidence interval 0.56-0.91; P = .006) and rotator cuff repair (odds ratio 0.71; confidence interval 0.58-0.87; P = .001) 1-year postoperatively than patients in the NLG group. At 1-year postoperatively, there was no difference in the rate of arthroplasty, arthroscopic synovectomy, and diagnostic arthroscopy between groups. At 2-year postoperatively, there was no difference in the rate of rotator cuff repair, arthroplasty, arthroscopic debridement, synovectomy, and diagnostic arthroscopy between groups.

Conclusions: Patients undergoing arthroscopic rotator cuff repair with or without a perioperative prescription for losartan had no significant difference in the rate of lysis of adhesions or manipulation under anesthesia at 1- or 2-year postoperatively, indicating that the antifibrotic properties of losartan may not have a clinically significant impact on shoulder stiffness after arthroscopic rotator cuff repair. However, patients with a prescription for losartan were less likely to undergo additional arthroscopic debridement and rotator cuff repair 1-year postoperatively than a matched cohort of patients without a prescription for losartan.

Level of Evidence: Level III, case control study.

BACK

Sling Is Not Inferior to Brace Immobilization After Arthroscopic Rotator Cuff Repair: A Randomized Controlled Trial

F. Schönweger, F. Marbach

DOI: https://doi.org/10.1016/j.arthro.2024.12.023

Purpose: To compare the safety and efficacy of immobilizing the upper limb with a brace versus a less-constrained sling in the rehabilitation after arthroscopic rotator cuff repair (ARCR), by documenting clinical and radiologic results.

Methods: ARCR was performed in 110 patients (54.9 ± 8.3 years) randomized in group A, using a brace for 6 weeks after surgery (3 weeks day and night then 3 weeks only at night), and group B, using a simple sling for 2 weeks only. Patients were evaluated at baseline, 6 weeks, and 3 and 6 months. Functional outcomes were range of motion, strength, Disabilities of the Arm, Shoulder and Hand score, and Constant-Murley Score (CMS). Pain was assessed with a visual analog scale and quality of life with the SF-36 questionnaire. The primary outcome was the CMS at 6 months. At 6 months, 3-Tesla magnetic resonance imaging was performed to document the status of the rotator cuff repair. The minimal clinically important difference was also analyzed.

Results: Both groups A and B showed a worsening at 6 weeks and an improvement at 3 and 6 months of Disabilities of the Arm, Shoulder and Hand and CMS, as well as a significant visual analog scale decrease at every follow-up ($P < .005$). SF-36 showed a different trend: General health improved at 6 weeks, then decreased at 3 months, and increased again at 6 months. No difference was retrieved between the 2 groups at any follow-up in terms of pain, functional, and general health scores. The minimal clinically important difference for the primary outcome was 14.5 points and was reached in 56.5% and 61.2% of patients in the sling and brace group, respectively. The evaluation of magnetic resonance imaging scans identified 5 patients in each group with a supraspinatus tendon re-rupture, with no statistical difference in the re-rupture rate between the 2 groups.

Conclusions: This randomized controlled trial demonstrated that ARCR postoperative sling immobilization was not inferior to immobilization with a brace, having no differences in terms of functional scores, pain levels, general health, and risk of tendon re-rupture.

Level of Evidence: Level I, high-quality randomized controlled trial (designed as a therapeutic study investigating the results of treatment) with statistically significant difference.

BACK

Generalized Joint Laxity Increases the Risk of Recurrence of Distal Radioulnar Joint Instability after Arthroscopic Foveal Repair of the Triangular Fibrocartilage Complex

J.S. Kim, K.E. Kim

DOI: https://doi.org/10.1016/j.arthro.2024.10.040

Purpose: To compare the clinical results of the arthroscopic foveal repair of the triangular fibrocartilage complex (TFCC) for distal radioulnar joint (DRUJ) instability in patients with or without generalized joint laxity.

Methods: Patients who underwent arthroscopic transosseous foveal TFCC repair of Palmer 1B foveal TFCC tears (Atzei classification class II or III) from January 2018 to October 2021 were identified. Patients treated for symptomatic DRUJ instability for more than 3 months, and with at least 2 years of follow-up, were included. Patients were categorized into two groups based on the Beighton and Horan criteria: those with generalized joint laxity (group L) and those without (group N). Clinical outcomes were measured by the Disabilities of the Arm, Shoulder, and Hand (DASH) score, modified Mayo wrist score (MMWS), wrist range of motion (ROM), grip strength, sports/recreation activity level, recurrent DRUJ instability, and achievement of minimal clinically important differences (MCID).

Results: One-hundred-and-twenty patients (Group L, 51 patients; Group N, 69 patients) were included. Both groups showed significant improvements in preoperative DASH and MMWS at the final follow-up. Overall, 103 patients (85.8%) achieved MCID, with 82.4% in Group L and 88.4% in Group N, and no significant differences between the two groups (P = .347). At the final follow-up, ROM and sports/recreation activity levels were similar between the groups. Significantly, the rates of postoperative DRUJ instability recurrence were 17.7% in group L (9/51) and 5.8% in group N (4/69) (P=0.039). Beighton scores were an independent risk factor for recurrent DRUJ instability in the multivariable analysis (P=0.024; odds ratio=1.62).

Conclusions: Clinical outcomes after arthroscopic TFCC foveal repair in patients with generalized joint laxity are comparable to those without, with 82.4% achieving MCID. Generalized joint laxity impacts DRUJ instability recurrence over a minimum 2-year follow-up period.

Level of Evidence: Level III, retrospective comparative study.

BACK

Journal of Shoulder and Elbow Surgery (JSES), Volume 34, issue 7

Therapeutic arthroscopy for noninfectious stiffness and anterior shoulder pain after reverse shoulder arthroplasty leads to clinical improvement in most patients with a low complication rate

J. Ardebol, M.B. Noble

DOI: https://doi.org/10.1016/j.jse.2024.10.011

Background: Reverse shoulder arthroplasty (RSA) exhibits favorable outcomes in managing rotator cuff arthropathy, primary glenohumeral arthritis, and complex proximal humeral fractures. Despite its success and reliability, certain patients experience persistent pain and stiffness. The clinical utility of therapeutic arthroscopy in RSA patients remains an area for investigation. The purpose of this study was to report clinical outcomes, including patient-reported outcomes (PROs), range of motion (ROM), and satisfaction, in patients who underwent therapeutic arthroscopy for noninfectious stiffness and subcoracoid impingement following RSA. The hypothesis was that patients would experience clinical improvement and satisfaction, with earlier intervention being superior to later intervention.

Methods: Multicenter retrospective review on patients who underwent therapeutic arthroscopy for noninfectious stiffness and anterior shoulder pain following RSA with minimum 1-year follow-up. PROs and ROM were collected preoperatively and postoperatively. Subjective improvement in ROM and pain, complications, satisfaction, and return to activities were recorded. Data was stratified into 2 cohorts based on timing of RSA to arthroscopy (1 year or less was considered early intervention and >1 year late intervention) and variables were analyzed for each cohort.

Results: A total of 19 patients met the study criteria (13 patients in early intervention cohort, 6 in late intervention cohort). The average time from the index surgery to arthroscopy was 7.7 ± 2.1 months in the early intervention cohort and 28.3 ± 10.3 months in the late intervention cohort (P = .004). The overall cohort improved significantly regarding pain (Visual Analog Scale [VAS]: Δ-1.1, P = .003), ROM (forward flexion [FF]: Δ21°, P = .002; external rotation: Δ14°, P = .010; internal rotation: Δ1 spinal level, P = .023) and PROs (American Shoulder and Elbow Surgeons: Δ18.2, P = .001; Subjective Shoulder Value: Δ16.3, P = .009). The early intervention cohort demonstrated significant improvement in VAS (Δ−1.1, P = .029), American Shoulder and Elbow Surgeons (Δ16.2, P = .013), Subjective Shoulder Value (Δ18.5, P = .008), FF (Δ23°, P = .016), and external rotation (Δ15°, P = .028). The late intervention cohort had significant improvement in VAS (Δ−1.3, P = .048) and FF (Δ17°, P = .017). Seventy-four percent of patients in the overall cohort reported decreased pain, 79% improvement in ROM, 68% returned to activities, and 74% were satisfied. There were no complications.

Conclusion: Therapeutic arthroscopy for noninfectious stiffness and anterior shoulder pain following RSA improves clinical outcomes in most patients with a low complication risk. Although postoperative outcomes were comparable between groups, functional improvement was more likely in patients who underwent intervention earlier.

Level of evidence: Level IV, Case Series, Treatment Study

BACK

Knee Surgery, Sports Traumatology, Arthroscopy (KSSTA), Volume 33, Issue 7

Revision rates and progression to shoulder arthroplasty after arthroscopic repair of massive rotator cuff tears

U.G. Longo, A. Lalli

DOI: https://doi.org/10.1002/ksa.12651

Purpose: The purpose of this systematic review was to assess the rate of progression to reverse total shoulder arthroplasty (RTSA) and to other interventions as revision surgeries after an arthroscopic repair of a massive rotator cuff tear (MRCT). Additionally, the review aimed at defining the best arthroscopic approach for the treatment of MRCTs in terms of failure and revision rates.

Methods: The purpose of this systematic review and meta-analysis was to evaluate the rates of progression to reverse total shoulder arthroplasty in patients who underwent primary arthroscopic repair of an MRCT with different arthroscopic procedures. A meta-analysis was performed to compare the rate of progression to revision surgery and reverse total shoulder arthroplasty.

Results: Eighteen articles were included in the qualitative synthesis and 14 articles were included in the meta-analysis. Overall, 934 patients and 950 shoulders were involved in the review. Seven-hundred and thirty patients and 735 shoulders were included in the meta-analysis. The proportion of revisions to reverse total shoulder arthroplasty was 0.9%, 3.3% and 0.1% for complete repair, partial repair and superior capsular reconstruction, respectively. No statistically significant differences were found across the groups in terms of progression to reverse total shoulder arthroplasty (n.s.). The average proportions of revisions to interventions different than reverse total shoulder arthroplasty. were 0.9% for complete repair, 2.0% for partial repair and 2.0% for superior capsular reconstruction again, no statistically relevant difference was found among the groups (n.s.).

Conclusion: The current review finds no statistically significant differences in the progression to reverse total shoulder arthroplasty or other revision procedures among partial repair, complete repair and superior capsular reconstruction for massive irreparable rotator cuff tears. It is crucial to understand the long-term outcomes of different surgical techniques for massive rotator cuff tears, particularly regarding failure rates and progression to further procedures.

Level of Evidence: Level IV

BACK

American Journal of Sports Medicine (AJSM), Volume 53, Issue 8

The Addition of Remplissage to Arthroscopic Bankart Repair and Effect on Recurrent Instability in Shoulders With Critical Humeral Bone Loss

Steuer F, Marcaccio S, Cong T, et al.

DOI: https://doi.org/10.1177/03635465251340082

Background: Recent literature has shown that inferior Hill-Sachs extension for on-track shoulders is predictive of recurrent instability after arthroscopic Bankart repair alone. Specifically, there is a high risk for recurrent instability when the lesion extends below the humeral equator on sagittal magnetic resonance imaging. This worrisome inferior extension has been termed “critical humeral bone loss (CHBL).” Remplissage has yet to be explored as a potential useful augmentation in patients with CHBL.

Purpose/hypothesis: The addition of remplissage would decrease recurrence rates for Hill-Sachs lesions with inferior extension or CHBL compared with arthroscopic Bankart repair alone in patients with on-track Hill-Sachs lesions.

Study Design: Case series; Level of evidence, 4

Methods: Retrospective analysis was performed on the records of patients who underwent primary arthroscopic Bankart repair with or without the addition of remplissage from 2007 to 2021. Off-track shoulders, revision stabilization, glenoid bone loss (GBL) >20%, and those with follow-up <2 years or incomplete medical data were excluded. The primary outcome was recurrent instability, defined as either postoperative dislocation or subluxation. The Hill-Sachs position was measured relative to the humeral axis on sagittal magnetic resonance imaging as previously described. Univariate and multivariate logistic regression analyses were implemented to determine the protective effect of remplissage.

Results: A total of 219 patients were included for analysis with a mean age of 21.1 years (range, 12.9-40.5 years) and mean follow-up of 7.0 years (range, 2-14.4 years); 44 patients (20%) underwent remplissage in addition to arthroscopic Bankart. In multivariate analysis, remplissage significantly reduced the risk of recurrent instability (OR, 0.06; P = .002) and CHBL was a significant predictor of recurrent instability (OR, 3.0; P = .029) while adjusting for age, multiple preoperative dislocations, contact athlete status, and percent GBL. When stratified by CHBL, remplissage remained protective (OR, 0.013; P = .007) against recurrent instability.

Conclusion: The addition of a remplissage for CHBL in patients with subcritical GBL and on-track Hill-Sachs lesions reduces the risk of recurrent instability in patients undergoing arthroscopic Bankart repair.

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Arthroscopy, Volume 41, Issue 7

Females Have Higher Return-to-Sport Rate Than Males Among Collegiate Athletes After Hip Arthroscopy for Femoroacetabular Impingement Due to the Difference in the Type of Sports, Type of Impingement, and Prevalence of Severe Cartilage Damage

H. Nishimura, S. Comfort

DOI: https://doi.org/10.1016/j.arthro.2024.10.016

Purpose: To investigate the return to sport (RTS) rate and the sex-based difference of collegiate athletes after arthroscopic treatment for femoroacetabular impingement (FAI).

Methods: Patients who were collegiate athletes at the time of surgery and underwent hip arthroscopy for treatment of FAI between January 2009 and June 2020 were included. Patients were excluded if they were in their final year of eligibility, graduated, retired, or had plans to retire from collegiate play before surgery. Publicly available data were collected regarding each patient's collegiate team and division and RTS status after surgery. Comparisons were made based on the RTS status and gender.

Results: Of the 181 hips (144 athletes) who met the inclusion criteria, 114 were male (63%) and 67 were female (37%), with a median age of 20.4 (range: 18.0-24.5). Eighty-six percent (155 hips) returned to sport at the collegiate level after hip arthroscopy. Males were significantly less likely to return to sport compared with females (82% vs 93%, odds ratio = 2.8, 95% confidence interval: 1.003-7.819, P = .042). Males participated in more contact sports (26% vs 1.5%, P < .001) and had more mixed-type FAI (95.6% vs 80.6%, P = .003) compared with females. In addition, males had more grade 3/4 chondral defects (28% vs 13%, P = .023) and underwent microfracture more frequently (11% vs 3%, P = .047). Further, males had significantly larger postoperative alpha angles (46.2 vs 43.6, P < .001).

Conclusions: Collegiate athletes were found to have a high RTS rate of 86% after arthroscopy for the treatment of FAI; however, males were less likely to RTS compared with females. Sex-based differences were identified in the type of sports, type of FAI, prevalence of severe cartilage damage, and postoperative alpha angle.

Level of Evidence: Level IV, retrospective case series.

BACK

Staged Hip Arthroscopy and Periacetabular Osteotomy in Active Patients Aged 45 Years and Older Produce Comparable Improvements in Outcome Scores to Younger Patients

J.H. Lee, N.G. Girardi

DOI: https://doi.org/10.1016/j.arthro.2024.10.039

Purpose: To determine staged hip arthroscopy and periacetabular osteotomy (PAO) mid-term outcomes in active patients aged 45 years and older compared with a younger group.

Methods: All patients aged 45 years and older who underwent staged arthroscopy and PAO between 2015 and 2021 were retrospectively analyzed and compared with a case-matched control group of younger patients. All patients underwent at least 6 months of nonoperative management prior to surgery. Prior to PAO, all patients underwent hip arthroscopy to address any intra-articular pathology. The experimental group consisted of patients with dysplasia aged 45 years and older without significant osteoarthritis who underwent PAO and reported patient-reported outcomes for a minimum of 1 year postoperatively. Patient-reported outcomes were quantified using the International Hip Outcome Tool 12 (iHOT-12) score and Non-arthritic Hip Score (NAHS).

Results: The cohort consisted of 35 patients (44 hips) with a mean age of 49.4 ± 3.8 years. The lateral center-edge angle significantly improved from preoperatively (20.1° ± 4.5°) to postoperatively (33.2° ± 3.2°, $P < .001$). The mean follow-up period in the PAO cohort aged 45 years and older was 2.80 years (standard deviation, 1.3 years) postoperatively. Patients reported significant improvements in the iHOT-12 score (36.6 ± 14.1 preoperatively vs 81.2 ± 21.0 at latest follow-up, $P < .001$) and NAHS (59.2 ± 15.5 preoperatively vs 87.4 ± 13.1 at latest follow-up, $P < .001$). The older cohort did not report significantly different iHOT-12 scores compared with the control group at any point, and age did not significantly affect either outcome score ($P > .05$).

Conclusions: Patients aged 45 years and older reported a statistically significant improvement in hip function and pain after staged hip arthroscopy and PAO, with outcome scores comparable to a younger cohort. Our findings show that appropriately selected older patients with dysplasia without significant pre-existing hip osteoarthritis experience clinically meaningful improvements in hip pain and function after hip preservation surgery.

Level of Evidence: Level III, retrospective, comparative case series.

BACK

Favorable Early Outcomes and High Clinical Benefit Achievement Rate With Concomitant Hip Arthroscopy and Periacetabular Osteotomy for the Treatment of Developmental Dysplasia of the Hip

D.R. Maldonado, A. Aboulafia

DOI: https://doi.org/10.1016/j.arthro.2024.11.064

Purpose: To report minimum 2-year follow-up patient-reported outcomes (PROs), clinical benefit, and survivorship in patients who underwent concomitant hip arthroscopy and periacetabular osteotomy (PAO) for the surgical treatment of the developmental dysplasia of the hip (DDH).

Methods: Prospectively collected data were retrospectively reviewed for patients who underwent hip arthroscopy with concomitant PAO between December 2015 and September 2022. Patients with baseline and minimum 2-year PROs were included. Exclusion criteria included those who underwent an isolated PAO or had a history of ipsilateral prior surgery. The PROs collected were Hip Outcome Score-Activities of Daily Living (HOS-ADL) and Hip Outcome Score-Sport-Specific Subscale (HOS-SSS). The minimal clinically important difference (MCID) was reported. Survivorship was defined as nonconversion to total hip arthroplasty (THA).

Results: Thirty patients were included (29 females and 1 male). The average age at the time of surgery was 27.48 ± 8.57 years, and the average body mass index was 23.97 ± 4.05. Further, 86.67%, 73.33%, and 100% underwent labral treatment, femoroplasty, and capsular closure, respectively. The preoperative lateral center-edge angle increased from 17.07° ± 4.40 to 33.24° ± 3.40 postoperatively ($P < .001$). At a minimum of 2-year follow-up, all PROs significantly improved from baseline ($P < .001$): HOS-ADL improved from 62.68 ± 16.18 to 91.66 ± 15.13, HOS-SSS from 38.96 ± 21.39 to 86.82 ± 19.56. Moreover, 90% and 93.33% achieved MCID for the HOS-ADL and HOS-SSS, respectively. No conversions to THA were reported.

Conclusions: At a minimum 2-year follow-up, the surgical management of DDH with PAO and concomitant hip arthroscopy demonstrated significant improvement in all PROs collected, with a high achievement rate for the MCID, and survivorship of 100%. These results suggest that, at short-term follow-up, this surgical approach seems to be safe and effective.

Level of Evidence: Level IV, retrospective case-series.

BACK

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Journal of Shoulder and Elbow Surgery (JSES), Volume 34, issue 7

No Lower Extremity Abstracts

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Knee Surgery, Sports Traumatology, Arthroscopy (KSSTA), Volume 33, Issue 7

Hip arthroscopy and periacetabular osteotomy generally improve sexual function in patients, but have a risk of iatrogenic pudendal nerve injury that can temporarily worsen sexual function: A systematic review

M. Hubbard, D. Pascarel

DOI: https://doi.org/10.1002/ksa.12700

Purpose: To summarise how orthopaedic hip sports medicine procedures affect patients' sexual function so that surgeons can better counsel their patients on this topic.

Methods: Three databases (MEDLINE, EMBASE and PubMed) were searched on 27 April 2024 with search terms relating to sexual activity and orthopaedic procedures. The authors adhered to the PRISMA and R-AMSTAR guidelines and Cochrane Handbook for Systematic Reviews of Interventions.

Results: Seventeen studies with a total of 5976 patients (6275 joints) were included in this study. Hip arthroscopies were performed in 5812 patients for a total of 6087 surgeries, and 164 patients received 188 osteotomies. Nine of 17 studies reported iatrogenic nerve injury (103/1854; 5.6%), mainly of the pudendal nerve (64/103, 62.1%). All of male, female, and combined male and female sexual function tended to be compromised prior to hip sports medicine surgery and improved after surgery as per International Index of Erectile Function (IIEF) ($p = 0.009$) and Female Sexual Function Index (FSFI) ($p < 0.001$) scores. Improvements after surgery were largely due to decreased hip pain and stiffness during sexual activity. Return to sexual activity was reported to be 29.2 ± 20.1 days after hip arthroscopy. Only three studies discussed preoperative counselling on sexual activity.

Conclusion: Hip sports medicine surgeries can improve sexual function for patients; however, they have a risk of pudendal nerve damage that can temporarily interfere with sexual function. Surgeons should counsel their patients on the risks and benefits of hip sports orthopaedic surgeries to sexual function.

Level of Evidence: Level IV

BACK

Ten-year outcomes of hip arthroscopy for femoroacetabular impingement with osteoarthritis: Sustained functional benefits but high conversion to total hip arthroplasty

S. Nikou, C. Sandlund

DOI: https://doi.org/10.1002/ksa.12709

Purpose: To evaluate the long-term clinical and radiographic outcomes of hip arthroscopy for femoroacetabular impingement syndrome (FAIS) in patients with mild to moderate osteoarthritis (OA). The hypothesis is that patients with FAIS and mild to moderate OA would experience sustained improvements in iHOT-12 at 10-year follow-up, despite natural OA progression.

Methods: This prospective cohort study included 75 patients (80 hips) with FAIS and radiographic signs of mild to moderate OA (Tönnis grade 1 or 2) who underwent hip arthroscopy between November 2011 and December 2012. The International Hip Outcome Tool (iHOT-12) was the primary outcome at a minimum of 10-year follow-up. Radiographic progression of OA using Tönnis classification and conversion to THA were recorded. Statistical analysis of patient-reported outcome measures (PROMs) was performed with Wilcoxon signed-rank test. Relative risk assessment (RR) for conversion to THA for Tönnis grade 1 and 2 was reported.

Results: At 10-year follow-up, 26 patients (29 hips) had undergone THA, resulting in a hip survivorship of 59% while 41% of hips progressed to THA by 10 years. The mean time to THA was 7.1 years (±1.5). Patients with Tönnis grade 2 at baseline had a significantly higher risk of THA compared with Tönnis grade 1 (RR = 3.44, 95% CI: 1.81–6.55, $p < 0.001$). Among non-THA patients, 79% reported satisfaction with surgery. The iHOT-12 score improved from 41.4 (±17.1) preoperatively to 71.0 (±26.7) at follow-up ($p < 0.001$), with 67% of patients exceeding the minimal important change (MIC) threshold. Radiographic progression of Tönnis grade was observed in four hips.

Conclusion: Hip arthroscopy in patients with FAIS and mild to moderate OA provides substantial long-term functional benefits for those patients not having to undergo THA. However, preoperative OA severity is a key predictor of THA conversion with nearly two-fifths of hips requiring THA within 10 years.

Level of Evidence: Level IV, case series

BACK

American Journal of Sports Medicine (AJSM), Volume 53, Issue 8

One-Year Outcomes Predict 10-Year Outcomes in Patients Undergoing Hip Arthroscopy for Femoroacetabular Impingement

Berzolla E, Esser KL, Gosnell GG, Mercer N, Kaplan DJ, Youm T.

DOI: https://doi.org/10.1177/03635465251342119

Background: While both short- and long-term outcomes after hip arthroscopy for femoroacetabular impingement syndrome (FAIS) have been reported, the predictive relationship between the two has yet to be established.

Purpose/hypothesis: To determine whether the degree of improvement in patient-reported outcomes observed at 1 year postoperatively predicts long-term outcomes at 10 years after primary hip arthroscopy for FAIS.

Study Design: Cohort study; Level of evidence, 3

Methods: Patients who underwent primary hip arthroscopy for FAIS by a single surgeon at a single institution with 10-year follow-up were identified. Outcomes were assessed using the modified Harris Hip Score (mHHS) and Nonarthritic Hip Score (NAHS) at baseline and 1, 2, 5, and 10 years postoperatively. Patients were classified as either high improvement (HI) or low improvement (LI) based on if they achieved the median 1-year change in mHHS from baseline. Chart review was performed to collect surgical details such as operative procedures, complications, and revision surgery. Outcomes were compared between groups over time using repeated-measures analysis of variance. Failure rates were determined using Kaplan-Meier and Mantel-Cox log-rank analyses.

Results: A total of 129 patients with a mean age of 41.0 ± 13.5 years and mean body mass index of 25.0 ± 4.3 kg/m2 were included. Both the HI and LI groups demonstrated significant improvement in mHHS and NAHS from baseline at all follow-up time points ($P < .001$). The HI group had significantly higher outcome scores at all time points up to 10 years after arthroscopy compared with the LI group ($P = .018$). Additionally, a greater proportion of patients in the HI group achieved the Patient Acceptable Symptom State and minimal clinically important difference compared with the LI group at the 10-year follow-up ($P = .018$). Rates of overall complications, revision arthroscopy, and conversion to total hip arthroscopy were significantly higher in the LI group ($P = .013$, $P = .009$, and $P = .004$, respectively). The mean hip survival time after the index operation was shorter for the LI group (11.9 ± 0.5 years) than for the HI group (13.2 ± 0.2 years) ($P = .002$).

Conclusion: Patients who experienced greater improvement in the first year after hip arthroscopy had superior 10-year outcome scores, fewer complications, and lower rates of reoperation compared with those who experienced minimal improvement in the same period.

BACK

Midterm Outcomes in Patients After Central Acetabular Decompression for Central Acetabular Stenosis: A Comparison With a Matched Control Group

Kuhns BD, Kahana-Rojkind AH, McCarroll TR, Kingham YE, Domb BG.

DOI: https://doi.org/10.1177/03635465251338064

Background: Central acetabular stenosis (CAS), defined as an osteophyte within the acetabular fossa, is associated with higher rates of femoral head chondral damage and, when left untreated, inferior short-term outcomes after hip arthroscopic surgery. Central acetabular decompression (CAD) is an arthroscopic technique to resect the osteophyte and resurface the acetabular fossa to improve contact mechanics of the femoral head.

Purpose/hypothesis: The primary aim was to provide the 5-year hip preservation rate and patient-reported outcomes in patients undergoing hip arthroscopic surgery for femoroacetabular impingement (FAI) concomitantly with CAD for CAS. A secondary aim was to compare outcomes in patients treated with CAD for CAS to a propensity score–matched control group of patients without CAS.

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

Methods: A surgical registry with prospectively collected data was reviewed for patients who underwent CAD for CAS identified during primary hip arthroscopic surgery for FAI. The primary outcome for the study was conversion to arthroplasty within 5 years postoperatively. Secondary outcomes included revision arthroscopic surgery and patient-reported outcome scores. Multivariate regression analysis was performed to evaluate the risk factors for progression to arthroplasty. A propensity score–matched control group based on preoperative age, sex, body mass index, and Tönnis grade was formed of patients undergoing hip arthroscopic surgery for FAI without CAS to evaluate the differences in outcomes between the 2 groups.

Results: There were 155 of 189 eligible patients (82.0%) who had a minimum 5-year follow-up. Within this cohort, the mean age was 45.9 ± 10.8 years, with 90 female patients (58.1%). At the 5-year time point, the arthroplasty-free survivorship rate was 80.6% (125/155). For patients not requiring arthroplasty, significant postoperative improvements were durable ($P < .001$), with high satisfaction. On multivariate analysis, severe acetabular chondral defects were most predictive of conversion to arthroplasty. The control group of patients with FAI without CAS demonstrated lower rates of chondral damage and higher rates of arthroplasty-free survivorship ($P < .01$). For patients not requiring arthroplasty, postoperative outcome scores, rates of achieving clinically relevant outcome thresholds, and satisfaction with surgery were comparable between the CAD and control groups.

Conclusion: Patients with CAS undergoing CAD during primary hip arthroscopic surgery for FAI had durable postoperative improvements and high satisfaction with surgery at a minimum 5-year follow-up. As expected, intraoperative chondral damage rates were significantly greater, and arthroplasty-free survivorship rates were lower, in the CAD group compared with the control group. Nonetheless, 81% of patients undergoing CAD who did not require arthroplasty had significant improvements that were comparable with the control group. We conclude that, with appropriate expectations, patients with FAI and CAS may be treated successfully with advanced arthroscopic techniques.

BACK

Surgeon-Driven Variation in the Cost of Hip Arthroscopic Surgery for Labral Tears: A Time-Driven Activity-Based Costing Analysis

Dean MC, Cherian NJ, Beck da Silva Etges AP, et al.

DOI: https://doi.org/10.1177/03635465251341463

Background: Amid mounting pressure to reduce health care spending, strategies for identifying and eliminating unwarranted variation in costs have garnered significant attention. Previous studies have characterized intersurgeon variation in costs for common orthopaedic procedures, but such variation remains unexplored in the context of hip arthroscopic surgery.

Purpose/hypothesis: To (1) characterize variation in the cost of hip arthroscopic surgery between surgeons using time-driven activity-based costing (TDABC) and (2) identify patient characteristics, intraoperative findings, and operative procedures underlying such intersurgeon variation in costs.

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

Methods: Employing TDABC, the authors determined the intraoperative cost of 890 outpatient hip arthroscopic surgery cases performed by 5 surgeons at 4 surgery centers from 2015 to 2022. All costs were calculated in United States dollars. Costs were normalized to protect the confidentiality of internal hospital cost data. Surgeon-specific mean costs were calculated with and without adjustment for patient characteristics, surgical personnel, operative factors, and surgery center. Finally, to elucidate the sources of surgeon-driven cost variation, the authors estimated the proportion of variation attributable to different cost subcategories, including labor, implant/allograft, and other supply costs.

Results: The intraoperative cost per patient ranged from 38.2 to 212.8 normalized cost units (mean, 100.0 ± 26.5), with a 1.6-fold variation in the mean cost between the highest and lowest cost surgeons. Operating surgeon alone explained 53.4% of the observed variation in costs. Controlling for case-specific features significantly improved the explanatory power to 91.8% ($P < .001$), but the adjusted variation in costs between surgeons remained essentially unchanged (decreased by <3%). Each of the 5 surgeons generated costs that deviated significantly from those predicted based on case-specific factors, with mean surgeon deviations ranging from −5.0% to 21.8% ($P < .001$ for all). Drivers of cost variation differed substantially between surgeons but generally stemmed from labor or other supply costs rather than implant/allograft costs.

Conclusion: The cost of outpatient hip arthroscopic surgery varied widely between surgeons; the cause of this deviation was multifactorial and surgeon specific. While within-surgeon cost variation was effectively explained by patient and operative characteristics, most between-surgeon variability remained unexplained by observable factors. These insights may support individual surgeons in cost reduction efforts and, more importantly, may enable the alignment of reimbursement rates with costs.

BACK

Sustained Clinical and Functional Outcomes After Primary Anterior Cruciate Ligament Repair: A Minimum 5-Year Follow-up Study

Conner-Rilk S, Goodhart GC, von Rehlingen-Prinz F, et al.

DOI: https://doi.org/10.1177/03635465251340087

Background: Primary anterior cruciate ligament (ACL) repair (ACLPR) demonstrates promising short-term clinical outcomes in select patients; however, it remains poorly understood as to whether previously reported short-term outcomes are maintained at midterm follow-up.

Purpose/hypothesis: To determine whether short-term (2-year) outcomes are maintained at 5 years after ACLPR, evaluate age-stratified failure and reoperation rates, and identify preoperative risk factors for failure.

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

Methods: This prospective study included the first 113 consecutive patients with proximal (type I/II) ACL tears who underwent ACLPR between 2008 and 2017 with a minimum 5-year follow-up. Failure rates were recorded based on instrumented laxity (>3-mm anterior tibial translation side-to-side difference), pivot-shift grade (grade ≥2), and subjective instability. Patient Acceptable Symptom State thresholds were established based on collected patient-reported outcome measure scores. Logistic regression models were constructed to determine associations with independent risk factors for failure.

Results: A total of 107 patients (median age, 35.5 years [interquartile range, 22.4-43.1 years]) were available at final follow-up (median, 6.0 years [interquartile range, 5.3-7.0 years]). No significant differences were reported in failure rates between 2- and 5-year follow-up: overall non–age-differentiated: 11.5% versus 15.9%, respectively (P = .34); ≤21 years: 37.0% versus 38.5%, respectively (P = .92); and >21 years: 3.5% versus 8.6%, respectively (P = .16). No failures occurred in patients aged ≤21 years, while 4 failures occurred in patients aged >21 years. Additionally, no significant differences were observed in overall non–age-differentiated reoperation rates (6.2% vs 7.5%, respectively; P = .71) and contralateral ACL injury rates (3.5% vs 4.7%, respectively; P = .67). Clinical outcomes and patient-reported outcome measure scores did not significantly differ between time points, and most patients met Patient Acceptable Symptom State thresholds (88% for International Knee Documentation Committee form, 91% for Lysholm scale, 93% for Forgotten Joint Score–12, and 84% for ACL–Return to Sport after Injury scale; all P < .001). Preoperative risk factor analysis only revealed younger age as negatively impacting ipsilateral ACL failure, as the odds decreased by 12.5% for each year of increasing age (P = .002).

Conclusion: Sustained clinical and functional outcomes for ACLPR were observed between short-term and midterm follow-up, with failure rates of 11.5% and 15.9%, respectively. Although younger age was an important risk factor for ipsilateral ACL failure, with a high failure rate of 37.0% in patients aged ≤21 years at short-term follow-up, no additional failures were observed at midterm follow-up. In contrast, patients aged >21 years experienced modest failure rates, increasing from 3.5% at short-term follow-up to 8.6% at midterm follow-up, with no significant change.

BACK

Return to Sport and Graft Failure Rates After Primary Anterior Cruciate Ligament Reconstruction With a Bone–Patellar Tendon–Bone Versus Hamstring Tendon Autograft: A Systematic Review and Meta-analysis

Connors JP, Cusano A, Saleet J, et al.

DOI: https://doi.org/10.1177/03635465241295713

Background: Anterior cruciate ligament (ACL) tears are frequent injuries in athletes that often require surgical reconstruction so that patients may return to their previous levels of performance. While existing data on patient-reported outcomes are similar between bone–patellar tendon–bone (BTB) and hamstring tendon (HT) autografts, the literature regarding return to sport (RTS), return to previous levels of sport activity, and graft failure rate remains limited.

Purpose/hypothesis: To compare rates of RTS, return to previous activity levels, and graft retears among athletes undergoing primary ACL reconstruction using a BTB versus HT autograft.

Study Design: Systematic review and meta-analysis; Level of evidence, 4.

Methods: The MEDLINE, Embase, and Cochrane Library databases were queried, and studies reporting on RTS after primary ACL reconstruction using a BTB or HT autograft were included. Exclusion criteria included revision reconstruction, ACL repair, quadriceps tendon autografts, allografts, graft augmentation, or double-bundle autografts. Rates of RTS, return to previous levels of activity, and retears were extracted and analyzed across included studies.

Results: A total of 33 articles met inclusion criteria, with a patient cohort of 4810 athletes. The overall RTS rate for all athletes was 80.4% (95% CI, 75.3%-84.6%) at a mean follow-up of 35.7 months, with 54.6% (95% CI, 48.5%-60.6%) returning to preinjury levels of activity. No significant difference was found between BTB and HT autografts with respect to rates of RTS, return to preinjury activity levels, or reruptures. The overall RTS rate in patients after primary ACL reconstruction with a BTB autograft was 83.3% (95% CI, 77.0%-88.2%), with 56.1% (95% CI, 49.3%-62.7%) returning to preinjury levels of activity. Conversely, the overall RTS rate in patients after primary ACL reconstruction with an HT autograft was 77.9% (95% CI, 70.3%-84.0%), with 53.5% (95% CI, 42.8%-63.9%) returning to preinjury levels of activity. The overall graft rerupture rate for the entire patient cohort was 3.6% (95% CI, 2.5%-5.1%), for patients with BTB grafts was 3.2% (95% CI, 1.9%-5.3%), and for patients with HT grafts was 4.4% (95% CI, 2.8%-6.8%).

Conclusion: Primary ACL reconstruction using BTB autografts demonstrated similar rates of RTS, return to previous activity levels, and reruptures compared with reconstruction using HT autografts.

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Journal of Bone and Joint Surgery (JBJS), Volume 107, Issue 13

No Lower Extremity Abstracts

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Clinical Orthopaedics and Related Research (CORR), Volume 483, Issue 7

No Lower Extremity Abstracts

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Bone and Joint Journal (BJJ), Volume 107, issue 7

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Miscellaneous

Arthroscopy, Volume 41, Issue 7

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Journal of Shoulder and Elbow Surgery (JSES), Volume 34, issue 7

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Knee Surgery, Sports Traumatology, Arthroscopy (KSSTA), Volume 33, Issue 7

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American Journal of Sports Medicine (AJSM), Volume 53, Issue 8

Arthroscopy Is at Least as Effective as Arthrotomy for Treatment of Septic Arthritis in Adults: A Systematic Review of Large and Intermediate Joints

Nudelman BM, Piple AS, Ferkel RD.

DOI: https://doi.org/10.1177/03635465241285878

Background: Surgical options for septic arthritis include open arthrotomy or an arthroscopic procedure. The optimal surgical technique remains a matter of debate as acceptable results have been reported for both.

Purpose/hypothesis: To evaluate the efficacy of arthroscopy versus arthrotomy for the treatment of septic arthritis in large and intermediate-sized joints.

Study Design: Systematic review; Level of evidence, 3.

Methods: A literature search was performed of the PubMed and Cochrane online databases through September 2023 identifying articles comparing arthroscopy with arthrotomy for the treatment of septic arthritis. Eligible articles included retrospective or prospective comparative studies investigating reoperation, perioperative complications, or clinical outcomes after arthroscopic or open treatment for septic arthritis of the shoulder, elbow, wrist, hip, knee, or ankle in adults.

Results: In total, 23 articles with 34,248 patients met the inclusion criteria comparing arthroscopy with arthrotomy. In 14 of the 20 (70%) studies that reported on reoperation rates, there was no significant difference in arthroscopic versus open surgical management for septic arthritis. Four (20%) studies reported lower reoperation rates when arthroscopy was utilized compared with open arthrotomy. One single-institution study found arthrotomy to be more effective for shoulder septic arthritis, and another favored open surgery only in the presence of erosions. In 11 of 23 (47.8%) studies, no difference in complications or clinical outcomes was found. However, 11 of 23 (47.8%) studies comprising the shoulder, wrist, hip, knee, and ankle reported a significant benefit to arthroscopy for improved outcomes.

Conclusion: Arthroscopic surgery for the treatment of septic arthritis involving the shoulder, wrist, hip, knee, and ankle appears to be safe and effective. Reoperation rates, short-term complications, and functional outcomes tend to be similar or in favor of arthroscopy when compared with arthrotomy.

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Journal of Bone and Joint Surgery (JBJS), Volume 107, Issue 13

No Miscellaneous Abstracts

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Clinical Orthopaedics and Related Research (CORR), Volume 483, Issue 7

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