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## Upper extremity

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### **High Rate of Return to Sporting Activity Among Overhead Athletes With Subpectoral Biceps Tenodesis for Type II SLAP Tear**

B.R. Waterman, J. Newgren, et al.

DOI: <https://doi.org/10.1016/j.arthro.2022.07.017>

**Purpose:** To evaluate the functional and athletic outcomes after primary subpectoral biceps tenodesis for type II SLAP tear in overhead athletes.

**Methods:** All competitive elite athletes with type II SLAP tears undergoing biceps tenodesis by a single surgeon were isolated between 2007 and 2015. Exclusion criteria were applied to individuals not involved in overhead athletics, clinical follow-up <24 months, adjacent rotator cuff or labral repair, concomitant SLAP repair, and/or previous arthroscopic shoulder surgery. Patient-reported outcome measures included visual analog scale (VAS), Kerlan Jobe Orthopaedic Clinic shoulder score, and Single Assessment Numerical Assessment. Clinical and sporting outcomes were recorded using a sports-specific questionnaire.

**Results:** Of 22 identified patients, 16 competitive overhead athletes (72.7%; 11 men, 5 women) with a mean age of 21.0 years were available at mean 4.5-year follow-up. Baseball or softball comprised the majority of patients (n = 9; 56.3%), followed by gymnastics (n = 2), swimming (n = 2), and other sports (n = 3). At mean 4.1 months postoperatively, 13 patients (81.3%) returned to previous level of athletic activity, whereas 2 patients (12.5%) failed to return to sporting activity and 1 (6.3%) returned at a lower level of competition. VAS pain significantly decreased from an average of 4.4 preoperatively to 1.7 postoperatively (P = .002), and mean Single Assessment Numerical Assessment scores also demonstrated significant improvement (55.4-76.7; P = .008). Final mean Kerlan Jobe Orthopaedic Clinic score was 74.0 (standard deviation 25.9), including 2 patients with suboptimal outcomes due to persistent pain. There were no significant differences in mean forward flexion or rotation in either the adducted or throwing position (P > .05), although small, significant decreases in postoperative active abduction were noted (165° vs 155°; P = .003).

**Conclusions:** In the current series of competitive overhead athletes, 81% of patients returned to previous level of play at an average of 4.1 months postoperatively after subpectoral biceps tenodesis for symptomatic SLAP tear. Athletes reliably experienced significant decreased activity-related pain with athletic function.

**Level of Evidence:** IV, case series.

## **Clinical Outcomes of Arthroscopic One-Tunnel Triangular Fibrocartilage Complex Transosseous Suture Repair Are Not Diminished in Cases of Ulnar Styloid Process Fracture Nonunion**

J.J. Nam, I.C. Choi, et al.

DOI: <https://doi.org/10.1016/j.arthro.2022.07.025>

**Purpose:** To determine whether clinical outcomes of arthroscopic one-tunnel wrist triangular fibrocartilage complex (TFCC) transosseous suture repair are not diminished in cases of ulnar styloid process fracture nonunion (USPFN).

**Methods:** Patients who underwent arthroscopic 1-tunnel transosseous suture repair of Palmer 1B foveal TFCC tear (with/without superficial fiber tear; Atzei class 2 or 3 TFCC tear) from 2015 to 2020 were retrospectively reviewed. Group I was the TFCC foveal tear repair group with USPFN. Group II was the TFCC foveal tear repair group without USPFN. In group I, no additional treatment for USPFN was made. Functional preoperative and postoperative outcomes were compared by Modified Mayo Wrist Score (MMWS); Quick Disabilities of the Arm, Shoulder, and Hand (Quick-DASH) score; grip strength; pain visual analog scale (VAS); and distal radioulnar joint (DRUJ) stability. Wrist posteroanterior, lateral, and both oblique views of the wrist were used to assess the ulnar styloid process before and after operation.

**Results:** This study consisted of 66 patients: group I (n = 22) and group II (n = 44). No differences were found between the 2 groups preoperatively in MMWS, Quick-DASH, grip strength, and VAS (MMWS: P = .94, Quick-DASH: P = .23, grip strength: P = .69, VAS: P = .45). No differences were found between the 2 groups with respect to outcome measures postoperatively in MMWS, Quick-DASH, grip strength, and VAS (MMWS: P = .59, Quick DASH: P = .82, grip strength: P = .15, VAS: P = .84). All of the enrolled patients achieved restored function with negative ballottement test and maintained DRUJ stability on follow-up. Of the 22 USPFN cases in group I, 11 (50%) showed spontaneous union after transosseous TFCC foveal repair without any additional USPFN treatment. The proportion of patients achieving a minimal clinically important difference for the Quick-DASH was similar between the 2 groups.

**Conclusions:** Although this current study has insufficient statistical power, the available data suggest that patients with TFCC foveal tear combined with USPFNs treated with arthroscopic transosseous repair surgery could experience similar functional improvement compared with those with TFCC foveal tear without USPFNs. The presence of USPFN accompanied by Palmer 1B type TFCC foveal tear may not affect the clinical results, including MMWS, Quick-DASH, grip strength, VAS, and DRUJ stability of patients who undergo arthroscopic 1-tunnel transosseous suture repair.

**Level of Evidence:** Level III, retrospective comparative study.

**New bone formation after arthroscopic Bankart repair for unstable shoulders with an erosion-type glenoid defect**

S. Nakagawa, T Hirose, T Ohori et al.

DOI: <https://doi.org/10.1016/j.jse.2022.06.013>

**Background:** The purpose of the present study was to retrospectively evaluate new bone formation after arthroscopic Bankart repair (ABR) and the influence of new bone formation on recurrence in shoulders with an erosion-type glenoid defect.

**Methods:** We analyzed data on shoulders with an erosion-type glenoid defect. Participants were patients who underwent computed tomography to evaluate new bone formation after ABR performed from 2004 to 2021 and were followed for a minimum of 2 years. We investigated the factors influencing new bone formation, in particular the presence of an intraoperative bone fragment, and the influence of new bone formation and its size on postoperative recurrence.

**Results:** A total of 100 shoulders were included. The mean glenoid defect size was  $10.1\% \pm 6.3\%$  (range, 1.2%-31.5%). New bone formed postoperatively in 15 shoulders (15.0%) and was seen in significantly more shoulders with an intraoperative bone fragment (11 of 18, 61.1%) than in those without a fragment (4 of 82, 4.9%;  $P < .001$ ). Recurrence occurred in 22 shoulders (22.0%), and the rate of recurrence was not different between shoulders with new bone formation (3 of 15, 20.0%) and without new bone formation (19 of 85, 22.4%;  $P = .999$ ). Among the 15 shoulders with new bone formation, the size of the new bone fragments relative to glenoid width was  $<5\%$  in 2 shoulders,  $5\% - <7.5\%$  in 8 shoulders,  $7.5\% - <10\%$  in 3 shoulders, and  $\geq 10\%$  in 2 shoulders; in all 3 shoulders with postoperative recurrence, the relative size was  $<7.5\%$ .

**Conclusion:** Even in shoulders with an erosion-type glenoid defect, new bone may form after ABR, especially in shoulders with an intraoperative bone fragment. However, new bone formation does not decrease the rate of postoperative recurrence.

**Level of evidence:** Level III, Retrospective Cohort Comparison, Prognosis Study

## All-inside technique versus in situ transtendon repair for Ellman III partial articular supraspinatus tendon avulsion

T. Yuan, S. Yang, H. Qian et al.

DOI: <https://doi.org/10.1016/j.jse.2022.06.018>

**Background:** The current surgical techniques for repairing Ellman III partial articular supraspinatus tendon avulsion (PASTA) is mainly tear completion followed by repair and in situ transtendon repair, and both techniques have been proven to have good clinical effects. In situ transtendon repair is more widely used because of its high performance in preserving the integrity of the bursal side supraspinatus tendon. However, there is still some scope for improvement. Our purpose was to compare the clinical outcomes of the all-inside repair technique and in situ transtendon repair for Ellman III PASTA.

**Methods:** A retrospective comparative study was conducted on 56 patients who suffered from Ellman III PASTA and underwent rotator cuff repair; 28 patients were treated with the all-inside technique (group A), and 28 patients were treated with the transtendinous technique (group B). All patients were followed up for at least 2 years. The visual analog scale (VAS), Constant, and American Shoulder and Elbow Surgeons (ASES) scores were used to evaluate the patient's shoulder joint function before surgery, 1 month and 3 months after surgery, and at the last time of follow-up.

**Results:** Group A showed superiority in pain and functional improvement 1 month after the operation: the VAS score,  $2.8 \pm 0.3$  in group A vs.  $4.7 \pm 0.4$  in group B ( $P = .042$ ); Constant score,  $73 \pm 5$  in group A vs.  $60 \pm 6$  in group B ( $P = .038$ ); and ASES score,  $75 \pm 5$  in group A vs.  $58 \pm 7$  in group B ( $P = .043$ ), whereas there was no statistical difference in group B. However, 3 months after surgery and at the last follow-up, the VAS, Constant, and ASES scores in both groups were significantly improved ( $P < .01$ ), and there was no significant statistical difference between the groups ( $P > .05$ ). Magnetic resonance imaging showed that the repaired rotator cuff tendon-bone healed well; at the last follow-up, all patients were in good function, the pain was completely relieved, and no revision was performed in both groups.

**Conclusion:** Arthroscopic repair of Ellman III PASTA provided satisfactory functional improvements and pain relief regardless of the all-inside and in situ transtendon repair techniques. However, the all-inside repair technique is more beneficial due to its dual function in preserving the intact bursa and avoidance of uneven tension of the articular side, which is advantageous to early postoperative rehabilitation.

**Level of evidence:** Level III, Retrospective Cohort Comparison, Treatment Study



## **Outcomes following arthroscopic posteromedial osteophyte resection and risk of future ulnar collateral ligament reconstruction**

R.W. Paul, U. Zareef, A.T. Hall et al.

DOI: <https://doi.org/10.1016/j.jse.2022.08.002>

**Background and hypothesis:** Despite successful return-to-sport (RTS) outcomes after posteromedial osteophyte resection, one possible consequence of osteophyte removal is increased stress on the ulnar collateral ligament (UCL), leading to a UCL injury. It is currently unknown how often overhead athletes who undergo isolated posteromedial osteophyte resection subsequently require UCL reconstruction (UCLR). Therefore, the purpose of this study was to report outcomes following arthroscopic resection of posteromedial osteophytes in overhead athletes and determine whether overhead athletes who underwent arthroscopic posteromedial osteophyte resection for posteromedial impingement went on to require UCL surgery. We hypothesized that there would be a high rate of RTS following osteophyte resection and that players who underwent arthroscopic posteromedial osteophyte resection would have a >10% risk of requiring subsequent UCLR or UCL repair.

**Materials and methods:** All patients who underwent elbow arthroscopy from 2010-2020 at a single institution were reviewed. Patients were included if they underwent isolated arthroscopic posteromedial osteophyte resection without concomitant UCL surgery, were overhead athletes at the onset of posteromedial impingement symptoms, and had no history of elbow surgery. Primary outcomes included RTS rate, complications, and subsequent shoulder and/or elbow injury and surgery, as well as several patient-reported outcome measures (Kerlan-Jobe Orthopaedic Clinic score, Timmerman-Andrews elbow score, and Conway-Jobe score).

**Results:** Overall, 36 overhead athletes were evaluated at  $5.1 \pm 3.4$  years postoperatively, including 28 baseball pitchers, 3 baseball catchers, 3 softball players, 1 tennis player, and 1 volleyball player. Of the overhead athletes, 77% were able to RTS; the mean Kerlan-Jobe Orthopaedic Clinic and satisfaction scores were 70 and 75, respectively; and 89% of athletes had either excellent (73%) or good (16%) Conway-Jobe scores at long-term follow-up. Subsequent UCLR was required in 18% of baseball pitchers ( $n = 5$ ) at a median of 13 months postoperatively. Of the 5 UCLRs, 3 were performed shortly after posteromedial osteophyte resection (6, 7, and 13 months postoperatively) whereas the other 2 were performed at 6.2 and 7.5 years postoperatively.

**Conclusion:** Following arthroscopic posteromedial osteophyte resection, 77% of athletes were able to RTS. Baseball pitchers who undergo arthroscopic resection of posteromedial osteophytes for posteromedial impingement have an 18% risk of subsequent UCLR.

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

**Arthroscopic rotator cuff repair: patients with physically demanding work have significantly worse time to return to work, level of employment, and job loss**

P. Feltri, A.S. Monteleone, F. Marbach et al.

DOI: <https://doi.org/10.1007/s00167-022-07172-3>

**Purpose:** The purpose of this study was to determine the results of arthroscopic rotator cuff repair (ARCR) in terms of return to work (RTW).

**Methods:** Inclusion criteria were working patients who underwent ARCR for rotator cuff rupture at the study site between 2008 and 2020 and minimum 12 months of follow-up. Patients were stratified based on the physical demand of their work according to the Canadian Classification and Dictionary of Occupations. The primary outcomes were time to RTW, level of employment (LoE), change of tasks, and work loss. Secondary outcomes included the return to sports activities, EQ-VAS, EQ-5D-5L, DASH, and Oxford Shoulder Score.

**Results:** Three-hundred and eighty-three patients were enrolled; at the follow-up evaluation, fifty-three patients (13.8%) lost their job, with a percentage of 34.4% (eleven patients) in the heavy-work category, and five patients (1.3%) chose early retirement. Other twenty-six patients (6.8%) had to lower their level of employment, and twenty patients (5.2%) changing their tasks, with 279 patients (72.9%) returning to their previous work activity. RTW was obtained at a mean time of  $4.7 \pm 4.6$  months, ranging from  $3.8 \pm 3.1$  months in the sedentary work vs  $5.8 \pm 2.8$  months in the very heavy-work category ( $p = 0.015$ ). The mean EQ-VAS score was  $77.3 \pm 18$  points, the mean Oxford Shoulder Score was  $43.4 \pm 7.2$  points, and the mean DASH score was  $9.9 \pm 14.5$  points; 75.3% returned to their previous level of sport activity.

**Conclusion:** The success of ARCR in terms of RTW is not always complete and varies significantly based on the physical demand of the patient's job. Patients with physically demanding work have a significantly higher time to RTW, reduction of the LoE, and job loss rate, thus affecting the possibility to have a satisfactory return to their previous life. The findings are of clinical relevance since they can help the surgeons to give their patients reliable expectations and to correctly plan the post-operative management.

**Level of evidence:** IV

**Clinical and Radiological Outcomes in Patients With Anterior Shoulder Instability and Glenoid Bone Loss after Arthroscopic Free Bone Block Combined With Dynamic Anterior Stabilization**

Chenliang Wu MD, Junjie Xu MD, Zhaoyi Fang MD, Jiebo Chen MD, Zipeng Ye MD, Xiulin Wu MD, Ziyun Li MD, Liren Wang MD, Yuhao Kang MD, Song Zhao MD, Caiqi Xu MD, Jinzhong Zhao MD

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**Background:** As an alternative to the Latarjet procedure, the arthroscopic free bone block (FBB) procedure combined with dynamic anterior stabilization (DAS) has been recently proposed to provide both glenoid augmentation and a tendon sling effect for treating anterior shoulder instability (ASI) with glenoid bone loss.

**Purpose:** To evaluate the clinical and radiological outcomes of FBB-DAS for ASI with glenoid bone loss.

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

**Methods:** Patients who underwent arthroscopic FBB-DAS for ASI with >15% glenoid bone loss between February 2017 and March 2020 were screened and enrolled in this study. Clinical outcome measures were assessed preoperatively and at a minimum 2-year follow-up, including recurrence, complications, shoulder functional scores, range of motion, and return to sports. Postoperative computed tomography and magnetic resonance imaging were also performed.

**Results:** Of a total of 65 patients with a mean follow-up of  $46.1 \pm 13.1$  months, no patients experienced a recurrent dislocation or subluxation postoperatively, while 2 had a positive anterior apprehension test (3.1%). Additionally, 2 patients (3.1%) experienced complications of hematoma and shoulder stiffness, respectively. The mean visual analog scale score, American Shoulder and Elbow Surgeons score, Rowe score, and Oxford Shoulder Instability Score all improved significantly from  $3.2 \pm 2.4$ ,  $75.0 \pm 18.9$ ,  $43.6 \pm 27.3$ , and  $33.8 \pm 9.0$  preoperatively to  $1.3 \pm 0.8$ ,  $95.1 \pm 8.0$ ,  $95.5 \pm 7.8$ , and  $14.8 \pm 3.5$  at final follow-up, respectively (all  $P < .001$ ). No difference was detected in range of motion except for  $8.1^\circ$  and  $7.5^\circ$  external rotation limitations in adduction and abduction, respectively. There were 62 patients (95.4%) who returned to sports, and 54 patients (83.1%) returned to the preinjury level. The transferred biceps tendon was intact in all 59 patients who completed radiological examination at the latest follow-up. Good bone healing was achieved in 98.3% of patients, and the glenoid bone defect decreased from 18.1% to 4.9%. Osseous and labral glenoids were significantly enlarged in width and depth on the latest magnetic resonance imaging (all  $P < .001$ ).

**Conclusion:** Arthroscopic FBB-DAS provided satisfactory clinical and radiological outcomes for ASI with glenoid bone loss. Despite slight external rotation restrictions, it achieved low recurrence and complication rates, excellent shoulder functional scores, a high return-to-sports rate, and favorable graft healing and remodeling.

## Complications Related to Latarjet Shoulder Stabilization: A Systematic Review

Chul-Hyun Cho MD, Sang Soo Na MD, Byung-Chan Choi MD, Du-Han Kim MD

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**Background:** In cases of recurrent anterior shoulder instability with a glenoid defect, Latarjet procedures are widely used for stabilization. Although complications with this procedure have been reported, few studies have comprehensively analyzed issues related to the Latarjet procedure.

**Purpose:** To identify the overall complication rate of the Latarjet procedure used for anterior shoulder instability and to compare the rate of complications between arthroscopic and open approaches.

**Study Design:** Systematic review; Level of evidence, 4.

**Methods:** PRISMA (Preferred Reporting Items for Systematic Reviews and Meta-Analyses) guidelines were followed by using the PubMed, EMBASE, Scopus, and Cochrane Library databases. Data on complications were extracted and classified as intraoperative, postoperative, or instability-related for further analysis. Quality assessments were performed with criteria from the Methodological Index for Nonrandomized Studies (MINORS). A quantitative synthesis of data was conducted to compare the complication rates between arthroscopic and open approaches.

**Results:** A total of 35 articles were included in this analysis. The MINORS score was 11.89. A total 2560 Latarjet procedures (2532 patients) were included. The overall complication rate was 16.1% (n = 412). The intraoperative complication rate was 3.4% (n = 87) and included a 1.9% (n = 48) incidence of nerve injuries and a 1.0% (n = 25) incidence of iatrogenic fractures. Screw problems, vascular injuries, and conversion arthroscopic to open surgery each occurred at a rate of <1%. The postoperative complication rate was 6.5% (n = 166), and the most common complication was nonunion (1.3%; n = 33). The instability-related complication rate was 6.2% (n = 159) and included a 1.5% (n = 38) rate of redislocation, a 2.9% (n = 75) rate of positive apprehension test, and a 1.0% (n = 26) rate of instability. Overall, 2.6% (n = 66) of patients required an unplanned secondary operation after the initial surgery. The arthroscopic approach was associated with a higher rate of intraoperative complications compared with the open approach (5.0% vs 2.9%; P = .020) and a lower rate of instability-related complications (3.1% vs 7.2%; P < .001).

**Conclusion:** The Latarjet procedure for anterior shoulder instability results in an overall complication rate of 16.1% and a reoperation rate of 2.6%. However, serious complications at short-term follow-up appear rare. When the arthroscopic approach was used, the rate of intraoperative complications was higher, although instability-related complications were lower when compared with the open approach.

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## Lower Extremity

Arthroscopy, Volume 39, Issue 1

### **Treatment of Severe Pincer-Type Femoroacetabular Impingement With Arthroscopic Significant Acetabular Rim Correction and Circumferential Labral Reconstruction Improves Patient-Reported Outcome Measures**

B.J. White, H. Spears, et al.

DOI: <https://doi.org/10.1016/j.arthro.2022.05.014>

**Purpose:** To validate an arthroscopic approach for performing significant acetabular rim correction and circumferential labral reconstruction required to treat severe pincer-type femoroacetabular impingement.

**Methods:** Using a minimum of 2-year follow-up, data from 48 hips, including 47 patients (11 male, 36 female; mean age of 42 years) having undergone significant arthroscopic acetabuloplasty for severe pincer impingement (center edge angle  $>45^\circ$ ) with concomitant circumferential allograft labral reconstruction were analyzed to determine improvements in patient-reported outcomes and degree of radiographic correction.

**Results:** Findings demonstrated a 98% success rate, including substantial improvements on all radiographic measurements and patient-reported outcomes. Minimal clinically important differences were met with extremely strong measures of effect. The mean center edge angle improved from  $49^\circ$  to  $36^\circ$  ( $M\Delta = 13.96$ ,  $P \leq .001$ , standard deviation [SD] = 55.97, confidence interval [CI] 12.17- 15.62,  $d = 2.33$ ) and the mean Tönnis angle improved from  $-6^\circ$  to  $0^\circ$  ( $M\Delta = 6.2$ ,  $P \leq .001$ , SD = 2.76 CI  $-7.1$  to  $-5.39$ ,  $d = 2.29$ ). Modified Hip Harris Scores improved by a mean of 34.45 points ( $P \leq .001$ , SD = 20.64, 95% CI 28.45-40.44,  $d = 1.66$ ). Lower extremity functional scale scores improved by a mean of 27.35 points ( $P \leq .001$ , SD = 18.37, 95% CI 22.02-32.69,  $d = 1.48$ ). No complications were reported. One case converted to a total hip arthroplasty (2%).

**Conclusions:** Findings validated that the significant acetabular rim correction required to treat severe pincer morphology is safe and feasible via an arthroscopic approach. This, in addition to concomitant circumferential allograft labral reconstruction, resulted in improvement in patient-reported outcomes and radiographic measurements.

**Level of Evidence:** Level IV, therapeutic case-series.

## **Propensity-Matched Patients Undergoing Revision Hip Arthroscopy Older Than the Age of 40 Years Had Greater Risk of Conversion to Total Hip Arthroplasty Compared With Their Primary Counterparts**

D.R. Maldonado, S.C. Diulus, et al.

DOI: <https://doi.org/10.1016/j.arthro.2022.06.014>

**Purpose:** To report patient-reported outcomes (PROs) and survivorship following revision hip arthroscopy in patients aged  $\geq 40$  years and to compare these results with a propensity-matched primary hip arthroscopy control group.

**Methods:** Data were prospectively collected and retrospectively reviewed for all patients who underwent revision hip arthroscopy between June 2008 and January 2019. Patients were included if they were  $\geq 40$  years of age at the time of surgery and had minimum 2-year follow-up for the modified Harris Hip Score, Nonarthritic Hip Score, Visual Analog Scale for pain, and the Hip Outcome Score-Sports Specific Subscale. Patients who had a previous hip condition, or those who lacked minimum 2-year follow-up, were excluded. The revision group was further analyzed by conducting a 1:1 propensity-matched sub-analysis to a primary hip arthroscopy control group based on age, sex, body mass index, and acetabular labrum articular disruption grade. Statistical significance was set at  $P < .05$ .

**Results:** Eighty-nine hips (92.7% follow-up) were included, with 66.3% being females. The mean age, body mass index, and follow-up time were  $49.4 \pm 8.0$  years,  $26.6 \pm 4.1$ , and  $62.7 \pm 38.5$  months, respectively. Significant improvement in all PROs ( $P < .001$ ) was reported, and 71.8%, 58.74.4%, and 65.2% achieved the minimal clinically important difference for the modified Harris Hip Score, Nonarthritic Hip Score, and Hip Outcome Score-Sports Specific Subscale, respectively. Eighty-seven revision hips were successfully propensity-matched to 87 primary hips. Both groups reported similar improvement for all PROs, but the relative risk of conversion to total hip arthroplasty was 2.63 times greater (95% confidence interval 1.20-5.79) for the revision group.

**Conclusions:** Patients aged  $\geq 40$  years who underwent revision hip arthroscopy reported significant improvement in all PROs at a mean follow-up of 62.7 months with favorable rates of achieving the minimal clinically important difference. When compared to the propensity-matched control group, both achieved similar rates of improvement, but the revision group was 2.63 times more likely to convert to total hip arthroplasty.

**Level of Evidence:** III. case-control study.

## **Revision Soft-Tissue Allograft Anterior Cruciate Ligament Reconstruction Is Associated With Lower Patient-Reported Outcomes Compared With Primary Anterior Cruciate Ligament Reconstruction in Patients Aged 40 and Older**

S.M. Sylvia, A.J. Toppo, et al.

DOI: <https://doi.org/10.1016/j.arthro.2022.06.035>

**Purpose:** To evaluate patient-reported outcomes (PROs) and graft failure rates in revision allograft anterior cruciate ligament reconstruction (ACLR) in patients aged 40 and older and compare them with primary ACLRs.

**Methods:** Patients aged 40 and older who underwent arthroscopic soft-tissue allograft ACLR between 2005 and 2016 with a minimum 2-year follow-up were retrospectively reviewed. Patients were grouped based on revision versus primary ACLR. The rate of achieving an International Knee Documentation Committee (IKDC) patient acceptable symptom state (PASS) score was recorded. Patient satisfaction, PROs, and graft failure were compared between groups using the  $\chi^2$  test, Fisher exact test, and Mann–Whitney U test.

**Results:** We identified 32 patients who underwent revision ACLR and 201 patients who underwent primary ACLR aged 40 and older who met inclusion criteria with a mean follow-up of 6.2 and 6.9 years, respectively ( $P = .042$ ). There was a lower rate of concomitant meniscal repair in the primary ACLR group (6% vs 21.9%,  $P = .007$ ) There were no other differences in chondral injuries, mechanism of injury, or meniscal injuries between groups. The median IKDC score was greater in the primary ACLR group as compared with the revision ACLR group (83.9 vs 70.6,  $P < .001$ ). Patients who underwent revision ACLR were less likely to achieve the IKDC PASS threshold (82.5% vs 56.3%,  $P = .001$ ) and were less likely to report satisfaction as compared with patients who underwent primary ACLR (90.5% vs 78.1%,  $P = .038$ ). No difference in graft failure rates was identified between groups (8% vs 15.6%,  $P = .180$ ).

**Conclusions:** Revision allograft ACLR in patients aged 40 and older was associated with lower PROs compared with primary ACLR. Patients who underwent revision ACLR failed to meet the IKDC PASS threshold more often and were dissatisfied with procedure results more than twice as often as patients that underwent primary ACLR.

**Level of Evidence:** III, retrospective cohort study.

## **Grinding, Clicking, and Pivot Pain Resolve in Most Patients After Knee Arthroscopy**

E.T. Sayegh, E.M. Farina, et al.

DOI: <https://doi.org/10.1016/j.arthro.2022.06.037>

**Purpose:** To determine whether knee arthroscopy alleviates the symptom constellation of knee grinding/clicking, catching/locking, and pivot pain.

**Methods:** One-year follow-up data from 584 consecutive subjects who underwent knee arthroscopy from August 2012 to December 2019 were collected prospectively. Subjects reported frequency of knee grinding/clicking, catching/locking, and/or pivot pain preoperatively and 1 and 2 years postoperatively. A single surgeon performed each procedure and documented all intraoperative pathology. We measured the postoperative resolution or persistence of these symptoms and used multivariable regression models to identify preoperative demographic and clinical variables that predicted symptom persistence. We also assessed changes in the Pain, Activities of Daily Living, and Quality of Life subscales of the Knee Injury and Osteoarthritis Outcome Score (KOOS).

**Results:** Postoperative symptom resolution was more likely for grinding/clicking (65.6%) and pivot pain (67.8%) than for catching/locking (44.1%). Smoking status, overweight/obesity, absence of meniscal tear, and number of compartments with focal cartilage lesions predicted persistence of 1 or more patient-reported knee symptoms. KOOS subscale scores consistently improved by at least one standard deviation. Individuals who had resolution of patient-reported knee symptoms exhibited roughly 2-fold improvements in KOOS Pain, ADL and Quality of Life scores compared with those whose symptoms persisted. Persistence of pivot pain was associated with the least improvement of the 3 KOOS subscales.

**Conclusions:** Two in three patients with grinding/clicking or pivot pain experience symptom resolution after knee arthroscopy, although catching/locking is more likely to persist. Smoking status, overweight/obesity, absence of meniscal tear, and number of compartments with focal cartilage lesions predict symptom persistence after knee arthroscopy.

**Level of Evidence:** Therapeutic Level IV, retrospective cohort analysis of prospective data.



## **Arthroscopic Anatomical Double-Bundle Medial Patellofemoral Complex Reconstruction Improves Clinical Outcomes in Treating Recurrent Patellar Dislocation Despite Trochlear Dysplasia, Elevated Tibial Tubercle–Trochlear Groove Distance, and Patellar Alta**

W. Shi, F. Hu, et al.

DOI: <https://doi.org/10.1016/j.arthro.2022.06.038>

**Purpose:** To evaluate the clinical outcomes of arthroscopically assisted double-bundle medial patellofemoral complex reconstruction (MPFC-R).

**Methods:** A retrospective review was carried out among adult patients who experienced at least 2 patellar dislocations and underwent primary arthroscopically assisted MPFC-R between January 2014 and November 2019. Dejour classification, tibial tubercle–trochlear groove (TT-TG) distance, and patellar height (with Insall–Salvati index) were measured. Pre- and postoperative patellar tilt were compared. Information on outcome scores, ability to return to sports, postoperative recurrent dislocations, and complications was recorded.

**Results:** A total of 42 MPFC-Rs in 39 patients were included. Mean age at surgery was  $22.2 \pm 7.6$  years; 69.2% of patients were female. Mean follow-up was  $47.3 \pm 20.2$  months. Seventy-four percent of cases had Dejour B (19.0%), C (33.3%), and D (21.4%) trochlear dysplasia; mean TT-TG distance was  $19.6 \pm 3.5$  mm, and mean Insall–Salvati index was  $1.21 \pm 0.17$ . Mean patellar tilt decreased from  $27.6 \pm 11.6^\circ$  to  $9.4 \pm 6.5^\circ$  ( $P < .001$ ). All patients had statistically significant ( $P < .001$ ) improvement in mean International Knee Documentation Committee (IKDC) ( $44.9 \pm 18.2$  to  $87.5 \pm 6.9$ ), Lysholm ( $61.4 \pm 16.6$  to  $94.1 \pm 6.4$ ), Kujala ( $56.0 \pm 16.8$  to  $92.9 \pm 5.3$ ), and Tegner score ( $2.7 \pm 1.3$  to  $4.6 \pm 1.4$ ). The majority of patients (96.9%) returned to sports, with 90.3% returning to the same or greater level of activity. No postoperative dislocations or subluxations were reported.

**Conclusions:** Arthroscopically assisted double-bundle MPFC-R is a promising procedure to treat recurrent patellar instability at 2- to 7-year mid-term follow-up, despite the presence of trochlear dysplasia, elevated TT-TG distance and patellar alta. The improvement of IKDC score exceeded the minimal clinically important difference in 95.2% patients, and 66.7% surpassed the patient acceptable symptomatic state based on postoperative IKDC score with no redislocations being reported at latest follow-up.

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

## **Femoral Version May Impact Hip Arthroscopy Outcomes in Select Patient Populations: A Systematic Review**

M.A. Sinkler, S.J. Magister, et al.

DOI: <https://doi.org/10.1016/j.arthro.2022.06.026>

**Purpose:** To provide further clarity regarding the management of patients with abnormal femoral version in the setting of hip arthroscopy and will discuss the definition of femoral version, the diagnostic and clinical evaluation of abnormal femoral version, and several described measurement techniques.

**Methods:** A systematic review was conducted in literature published before August 2021 that measured femoral version and reported patient-reported outcomes measures or rates of subsequent procedures following hip arthroscopy. Preferred Reporting Items for Systematic Reviews and Meta-Analyses guidelines were followed and the electronic databases, PubMed, OvidMedLine, Scopus, and Web of Science were searched. Two blinded reviews screened and evaluated data quality using the Newcastle-Ottawa Scale.

**Results:** Eighteen studies were included with 11 studies reporting patient outcomes and 7 studies reporting rates of subsequent procedures. The most commonly used definition of femoral version was 5° to 20° of femoral anteversion. Computed tomography scan was the most commonly used imaging modality. The majority of studies (7 of 11) demonstrated that femoral version does not have an impact on patient-reported outcomes measures and is not predictive of clinically meaningful improvement scores. However, in select studies, patients with femoral retroversion were found to experience slightly inferior outcomes following hip arthroscopy for femoroacetabular impingement. While femoral retroversion may be a risk factor for subsequent procedures, 3 of 7 studies refute this claim. Although in patients with borderline hip dysplasia, excessive femoral anteversion led to greater rates of subsequent hip procedures.

**Conclusions:** While the majority of studies show that femoral version does not have an impact on patient-reported outcomes following hip arthroscopy, those with femoral retroversion and with excessive anteversion with coexisting borderline hip dysplasia need to be educated on their increased risk of subsequent operation. Ultimately, this review suggests that clinical improvement can likely be achieved regardless of femoral version.

**Level of Evidence:** IV; systematic review of Level I-IV studies.

**Hip arthroscopy for femoroacetabular impingement is associated with significant improvement in early patient reported outcomes: analysis of 4963 cases from the UK non-arthroplasty registry (NAHR) dataset**

R. Holleyman, M.A. Sohatee, S. Lyman et al.

DOI: <https://doi.org/10.1007/s00167-022-07042-y>

**Purpose:** Results from recent randomised controlled trials demonstrate the superiority of surgery over physiotherapy in patients with femoroacetabular impingement (FAI) of the hip in early follow-up. However, there is paucity of evidence regarding which factors influence outcomes of FAI surgery, particularly notable is the lack of information on the effect of impingement subtype (cam or pincer or mixed) on patient reported outcomes measures (PROMs). This study aims to evaluate the early outcomes of hip arthroscopy for FAI, and their determinants.

**Methods:** This is a retrospective analysis of prospectively collected data from the UK Non-Arthroplasty Hip Registry (NAHR) of patients undergoing arthroscopic intervention for FAI between 2012 and 2019. The null hypothesis was that there is no difference in PROMs, based on morphological subtype of FAI treated or patient characteristics, at each follow-up timepoint. The outcome measures used for the study were the iHOT-12 score and the EQ5D Index and VAS 6- and 12-month follow-up.

**Results:** A cohort of 4963 patients who underwent arthroscopic treatment of FAI were identified on the NAHR database. For all FAI pathology groups, there was significant improvement from pre-operative PROMs when compared to those at 6 and 12 months. Overall, two-thirds of patients achieved the minimum clinically important difference (MCID), and almost half achieved substantial clinical benefit (SCB) for iHOT-12 by 12 months. Pre-operatively, and at 12-month follow-up, iHOT-12 scores were significantly poorer in the pincer group compared to the cam and mixed pathology groups ( $p < 0.01$ ). Multivariable analysis revealed PROMS improvement in the setting of a higher-grade cartilage lesion.

**Conclusion:** This registry study demonstrates that hip arthroscopy is an effective surgical treatment for patients with symptomatic FAI and results in a statistically significant improvement in PROMs which are maintained through 12 months follow-up.

**Level of evidence:** III

## **Endoscopic-assisted locking block modified Krackow technique combined with a V-Y flap for chronic Achilles tendon rupture**

T. Xu, X Liu, J. Tian et al.

DOI: <https://doi.org/10.1007/s00167-022-07167-0>

**Purpose:** The purpose of this study was to evaluate the clinical outcomes of the endoscopic-assisted locking block modified Krackow technique with a V-Y flap. The hypothesis was that the minimally invasive technique can reduce wound complications and facilitate early recovery.

**Methods:** In total, 29 men with chronic Achilles tendon rupture who underwent either minimally invasive technique ( $n=13$ ) or open repair ( $n=16$ ) at our department between 2013 and 2019 were retrospectively analyzed. The rate of complications, time to return to moderate-intensity exercise, American Orthopedic Foot and Ankle Society ankle hindfoot score, Achilles tendon Total Rupture Score, heel-rise repetitions in 1 min, heel-rise height, and bilateral calf circumference at 6 months, 1 year, and 2 years postoperatively were recorded.

**Results:** All incisions healed primarily in the minimally invasive technique group; however, three patients in the open repair group experienced wound complications. The time to return to moderate-intensity exercise, American Orthopedic Foot and Ankle Society score, Achilles tendon Total Rupture Score, heel-rise repetition ratio, and heel-rise height ratio at 6 months postoperatively in the minimally invasive technique group were significantly better than those in the open repair group. However, it was not significantly different between both groups at 2 years postoperatively.

**Conclusion:** Endoscopy allowed scar tissue and adhesions to be removed, allowing the tendon ends to be mobilized out of the small proximal and distal incisions. Minimally invasive technique may result in a lower wound complication incidence and provide better early functional recovery and return to moderate-intensity exercise time than the conventional open procedure in treating chronic Achilles tendon ruptures.

**Clinical trial registration:** Wuxi Ninth People's Hospital Medical Ethical Committee, LW2021026.

**Level of evidence:** III

## **Ipsilateral chondral lesions worsen the long-term prognosis following arthroscopic partial medial meniscectomy**

O.N. Erođlu, A. Asma, M. Armađan et al.

DOI: <https://doi.org/10.1007/s00167-022-07086-0>

**Purpose:** The effect of knee cartilage defects that are detected during partial meniscectomy remains controversial in terms of the long-term prognosis on knee function. This study aimed to investigate the effect of concurrent medial compartment focal cartilage lesions on the long-term prognosis of knee function in patients who underwent arthroscopic partial medial meniscectomy for traumatic medial meniscal tears.

**Methods:** This retrospective study analyzed 46 patients who underwent arthroscopic partial medial meniscectomy between 1991 and 2008 by a single surgeon. Twenty-one patients who underwent arthroscopic partial medial meniscectomy due to traumatic meniscal tear had focal chondral lesions only at the medial compartment, and these patients were assigned to group A. Twenty-five patients who had no cartilage lesions in any compartments were assigned to group B. The age, sex, body mass index (BMI), follow-up time, age at the time of surgery, clinical and radiological scores, and perioperative arthroscopy findings were analyzed.

**Results:** The mean follow-up time was  $20 \pm 3.7$  years. No significant difference was found in the demographic data, and the average age of the patients at the time of operation was  $35 \pm 9.5$  years. Both groups had improved Lysholm score at the last follow-up. Although no difference was found between the groups during the preoperative period, group B had a higher Lysholm score at the last follow-up than group A. The mean International Knee Documentation Committee (IKDC) and Knee injury and Osteoarthritis Outcome Score (KOOS) scores at the last follow-up were significantly higher in group B. The mean Kellgren–Lawrence grades in the operated knees of group A were higher than those of group B. In group A, a negative correlation was found between the BMI and postoperative Lysholm ( $r = -0.461, p = 0.03$ ) IKDC ( $r = -0.433, p = 0.05$ ) and KOOS ( $r = -0.565, p = 0.008$ ) scores. In group B, no correlation was found between BMI and any score.

**Conclusion:** Among patients who underwent arthroscopic partial medial meniscectomy with an average follow-up of 20 years, those with concurrent focal cartilage defect in the medial compartment had clinically and radiologically worse outcomes than patients without any cartilage defect. Therefore, orthopedic surgeons should be meticulous before performing any arthroscopic partial medial meniscectomy in case of concurrent cartilage lesion.

**Level of evidence:** III

## **Survivorship and Reoperation of 324 Consecutive Isolated or Combined Arthroscopic Meniscal Allograft Transplants Using Soft Tissue Fixation**

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Giuseppe Filardo MD, PhD, MBA, Prof., Gian Andrea Lucidi MD, Maurilio Marcacci Prof., Stefano Zaffagnini Prof.

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**Background:** Meniscal allograft transplant (MAT) is an effective treatment for relieving symptoms and improving knee function in patients who experience symptomatic unicompartmental knee pain after a previous meniscectomy. However, the literature contains a paucity of studies assessing the survival rate and prognostic factors of soft tissue MAT.

**Purpose:** To report the survivorship of a large, single-center cohort of consecutive patients treated with arthroscopic MAT using soft tissue technique and to investigate variables that could potentially influence failures and outcomes.

**Study design:** Case series; Level of evidence, 4.

**Methods:** Consecutive MAT procedures totaling 364 performed in a single institution between June 2004 and April 2019 were screened and assessed for eligibility. Subjective clinical scores (Lysholm score, Tegner activity scale, and visual analog score) were collected preoperatively and at 2, 5, 7, and 10 years of follow-up. Two survival analyses were performed using Kaplan-Meier curves, with surgical failure (defined as any graft revision) and clinical failure (defined as a Lysholm score <65 points) used as endpoints. Univariate analyses were performed using reoperations, surgical failure, clinical failure, and different demographic and surgical characteristics as endpoints.

**Results:** A total of 324 consecutive patients were evaluated at a mean follow-up  $5.7 \pm 3.0$  years. Of these, 189 (58%) underwent an associated surgical procedure. A total of 22 patients (6.8%) were considered to have experienced surgical failure, and no predictors of surgical failure were identified based on the relevant variables. When all patients were considered, a significant improvement in all of the patient-reported outcome measures was present between the preoperative assessment and the last follow-up ( $P < .001$ ), with no significant decrease over time. Moreover, 70 (21.6%) patients were considered to have experienced clinical failure; the need for concurrent cartilage procedures (odds ratio, 0.16;  $P = .001$ ) and anterior cruciate ligament (ACL) reconstruction (odds ratio, 0.40;  $P = .059$ ) were predictors of failure. Finally, a lower survival rate was reported in female patients compared with male patients (49% vs 69%, respectively;  $P = .007$ ) and in patients who required cartilage surgery ( $P = .014$ ). In particular, patients who required cartilage surgery showed nearly half the survival rate compared with those with required no cartilage procedures at 10-year follow-up (36.4% vs 71%, respectively;  $P = .029$ ).

**Conclusion:** Female sex and the need to combine MAT with a cartilage procedure or ACL reconstruction could result in an increased rate of clinical failure at midterm follow-up.

## **Moderators, Mediators, and Prognostic Indicators of Treatment With Hip Arthroscopy or Physical Therapy for Femoroacetabular Impingement Syndrome: Secondary Analyses From the Australian FASHIoN Trial**

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**Background:** Although randomized controlled trials comparing hip arthroscopy with physical therapy for the treatment of femoroacetabular impingement (FAI) syndrome have emerged, no studies have investigated potential moderators or mediators of change in hip-related quality of life.

**Purpose:** To explore potential moderators, mediators, and prognostic indicators of the effect of hip arthroscopy and physical therapy on change in 33-item international Hip Outcome Tool (iHOT-33) score for FAI syndrome.

**Study Design:** Cohort study; Level of evidence, 2.

**Methods:** Overall, 99 participants were recruited from the clinics of orthopaedic surgeons and randomly allocated to treatment with hip arthroscopy or physical therapy. Change in iHOT-33 score from baseline to 12 months was the dependent outcome for analyses of moderators, mediators, and prognostic indicators. Variables investigated as potential moderators/prognostic indicators were demographic variables, symptom duration, alpha angle, lateral center-edge angle (LCEA), Hip Osteoarthritis MRI Scoring System (HOAMS) for selected magnetic resonance imaging (MRI) features, and delayed gadolinium-enhanced MRI of cartilage (dGEMRIC) score. Potential mediators investigated were change in chosen bony morphology measures, HOAMS, and dGEMRIC score from baseline to 12 months. For hip arthroscopy, intraoperative procedures performed (femoral ostectomy ± acetabular ostectomy ± labral repair ± ligamentum teres debridement) and quality of surgery graded by a blinded surgical review panel were investigated for potential association with iHOT-33 change. For physical therapy, fidelity to the physical therapy program was investigated for potential association with iHOT-33 change.

**Results:** A total of 81 participants were included in the final moderator/prognostic indicator analysis and 85 participants in the final mediator analysis after exclusion of those with missing data. No significant moderators or mediators of change in iHOT-33 score from baseline to 12 months were identified. Patients with smaller baseline LCEA ( $\beta = -0.82$ ;  $P = .034$ ), access to private health care ( $\beta = 12.91$ ;  $P = .013$ ), and worse baseline iHOT-33 score ( $\beta = -0.48$ ;  $P < .001$ ) had greater iHOT-33 improvement from baseline to 12 months, irrespective of treatment allocation, and thus were prognostic indicators of treatment response. Unsatisfactory treatment fidelity was associated with worse treatment response ( $\beta = -24.27$ ;  $P = .013$ ) for physical therapy. The quality of surgery and procedures performed were not associated with iHOT-33 change for hip arthroscopy ( $P = .460$ -.665 and  $P = .096$ -.824, respectively).

[BACK](#)

**Conclusion:** No moderators or mediators of change in hip-related quality of life were identified for treatment of FAI syndrome with hip arthroscopy or physical therapy in these exploratory analyses. Patients who accessed the Australian private health care system, had smaller LCEAs, and had worse baseline iHOT-33 scores, experienced greater iHOT-33 improvement, irrespective of treatment allocation.



## **A Prospective Comparison of Groin-Related Complications After Hip Arthroscopy With and Without a Perineal Post**

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**Background:** Previous studies have demonstrated various groin-related nerve and soft tissue complications in patients undergoing hip arthroscopy with a perineal post.

**Purpose:** To prospectively compare groin-related nerve and soft tissue complications between patients undergoing hip arthroscopy with and without the use of a perineal post.

**Study Design:** Cohort study; Level of evidence, 2.

**Methods:** A prospective single-surgeon cohort study was performed on all patients undergoing hip arthroscopy by the senior author between January 2020 and March 2022. A post-free hip distraction system was used at 1 center in which the senior author operates, and a system with a large padded perineal post was used at another surgical location. Patients completed a survey at the first postoperative visit (7-10 days) to determine if they had experienced any groin-related complications after surgery (groin numbness, sexual/urinary dysfunction, skin tears). Patients with a positive survey response repeated the survey at each follow-up visit (6 weeks, 3 months, 6 months) until the symptoms resolved. The rate and duration of groin-related complications were then compared between the groups.

**Results:** A total of 87 patients were included in the study who underwent hip arthroscopy: 53 with a perineal post and 34 without. No differences were found between the post and postless groups in terms of age at surgery, sex, body mass index, or traction time. We found that 16 patients (30%) in the perineal post group experienced groin numbness versus 0 (0%) in the postless group ( $P < .0001$ ). On average, groin numbness lasted  $5 \pm 3$  days (mean  $\pm$  SD) in the perineal post group. Three patients in the perineal post group experienced sexual dysfunction for a mean 7 days, as compared with none in the postless group. Seventeen patients (32%) in the perineal post group experienced foot numbness versus 4 (12%) in the postless group ( $P = .04$ ). One patient in the perineal post group reported a superficial skin tear.

**Conclusion:** Postless hip arthroscopy resulted in no risk of groin-related complications as compared with traditional hip arthroscopy with a perineal post.

## **Return to Sports After Total Hip Arthroplasty: An Umbrella Review for Consensus Guidelines**

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**Background:** Current recommendations on safe return to sports (RTS) after total hip arthroplasty (THA) are subjective and based on studies of varying quality.

**Purpose:** The aim of this study was to synthesize systematic reviews and meta-analyses on post-THA RTS to propose practice guidelines identifying which sports can be resumed, when they can be resumed, and what risks are present.

**Study Design:** Systematic review; Level of evidence, 4.

**Methods:** This umbrella review followed the Joanna Briggs Institute (JBI) protocol and PRISMA (Preferred Reporting Items for Systematic Reviews and Meta-Analyses) guidelines. The Embase, Medline, and Cochrane databases were searched. Included studies were either systematic reviews or meta-analyses addressing primary or secondary outcomes. Outcomes of interest included safe sports after THA, time to RTS, prognostic indicators of RTS, reasons patients do not RTS, percentage of patients who RTS, implant complications, and objective classification of sports by impact level. Included reviews had data extracted and were assessed for methodological quality using the JBI protocol. The authors defined RTS as “returning to a sport the patient participated in at any point preoperatively.”

**Results:** Patients demonstrated a trend toward lower-impact sports postoperatively. Sports were classified as low (eg, walking), moderate (eg, downhill skiing), or high impact (eg, soccer). A total of 82% (range, 55%-104%) of patients were able to RTS at a mean time of 6 months (range, 4-7 months). The best prognostic indicator for RTS was previous experience in that sport. The main reason patients did not RTS was surgeon recommendation. Aseptic loosening was the most cited complication after RTS.

**Conclusion:** Most patients are able to return to preoperative levels of low- (eg, walking) and moderate-impact (eg, hiking) sports between 7 and 12 months after THA. Patients planning a return to high-impact (eg, singles tennis) sports should be counseled on the possible risks of traumatic injuries and aseptic loosening and monitored closely.

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## Miscellaneous

Knee Surgery, Sports Traumatology, Arthroscopy (KSSTA), Volume 31, Issue 1, Pages p102-109

### **The German Arthroscopy Registry DART: what has happened after 5 years?**

M. Hinz, C. Lutter, R Mueller-Rath et al.

DOI: <https://doi.org/10.1007/s00167-022-07152-7>

**Purpose:** The German Arthroscopy Registry (DART) has been initiated in 2017 with the aim to collect real-life data of patients undergoing knee, shoulder, hip or ankle surgery. The purpose of this study was to present an overview of the current status and the collected data thus far.

**Methods:** Data entered between 11/2017 and 01/2022 were analyzed. The number of cases (each case is defined as a single operation with or without concomitant procedures) entered for each joint, follow-up rates and trends between different age groups (18–29 years, 30–44 years, 45–64 years, ≥ 65 years) and across genders, and quality of life improvement (pre- vs. 1 year postoperative EQ visual analogue scale [EQ-VAS]) for frequently performed procedures (medial meniscus repair [MMR] vs. rotator cuff repair [RCR] vs. microfracturing of the talus [MFX-T]) were investigated.

**Results:** Overall, 6651 cases were entered into DART, forming three distinct modules classified by joint (5370 knee, 1053 shoulder and 228 ankle cases). The most commonly entered procedures were: knee: partial medial meniscectomy (n = 2089), chondroplasty (n = 1389), anterior cruciate ligament reconstruction with hamstring autograft (n = 880); shoulder: sub acromial decompression (n = 631), bursectomy (n = 385), RCR (n = 359); ankle: partial synovectomy (n = 117), tibial osteophyte resection (n = 72), loose body removal (n = 48). In the knee and shoulder modules, middle-aged patients were the predominant age group, whereas in the ankle module, the youngest age group was the most frequent one. The two oldest age groups had the highest 1-year follow-up rates across all modules. In the knee and shoulder module, 1-year follow-up rates were higher in female patients, whereas follow-up rates were higher in male patients in the ankle module. From pre- to 1-year postoperative, MFX-T (EQ-VAS: 50.0 [25–75% interquartile range: 31.8–71.5] to 75.0 [54.3–84.3];  $\Delta$  + 25.0) led to a comparably larger improvement in quality of life than did MMR (EQ-VAS: 70.0 [50.0–80.0] to 85.0 [70.0–94.0];  $\Delta$  + 15.0) or RCR (EQ-VAS: 67.0 [50.0–80.0] to 85.0 [70.0–95.0];  $\Delta$  + 18.0).

**Conclusion:** DART has been sufficiently established and collects high-quality patient-related data with satisfactory follow-up allowing for a comprehensive analysis of the collected data. The current focus lies on improving patient enrolment and follow-up rates as well as initiating the hip module.