

What the papers say

Ali Bajwa

Villar Bajwa Practice, Princess Grace Hospital, 30 Devonshire street London, W1G 6PU, United Kingdom E-mail: enquiries@villarbajwa.com

The *Journal of Hip Preservation Surgery* is not the only place where work in the field of hip preservation can be published. Although our aim is to offer the best of the best, we are continually fascinated by work, which finds its way into journals other than our own. There is much to learn from it, and so *Journal of Hip Preservation Surgery* has selected six recent and topical subjects for those who seek a summary of what is taking place in our ever-fascinating world of hip preservation. What you see here are the mildly edited abstracts of the original articles, and to give them what *Journal of Hip Preservation Surgery* hopes is a more readable feel. If you are pushed for time, what follows should take you no more than 10 min to read. So here goes ...

TO INVESTIGATE THE OUTCOMES OF HIP ARTHROSCOPY FOR FEMOROACETABULAR IMPINGEMENT (FAI) IN PATIENTS OVER THE AGE OF 50 YEARS

The authors from Beijing [1] report a therapeutic case series study. A total of 27 patients with FAI over the age of 50 years who met inclusion and exclusion criteria and were being followed up for at least 2 years in the orthopedics department at their hospital between January 2015 and October 2017 were recruited for a prospective analysis on the outcomes of hip arthroscopy. All patients underwent unilateral surgery. Of the patients included, there were 15 men and 12 women, who were aged 50–74 years old (57 ± 6.4 years). The outcomes were assessed using the visual analog scale, the modified Harris hip score (mHHS) and the International Hip Outcome Tool.

A total of 27 patients were followed up for at least 2 years. The post-operative center-edge angle, the alpha angle and the offset decreased significantly compared with preoperative measurements. The mHHS before surgery and at 1 and 2 years after surgery was 62.19 ± 7.47 , 86.70 ± 5.80 and 87.89 ± 5.08 , respectively; International Hip Outcome Tool scores were 30.44 ± 4.22 , 73.56 ± 3.89 and 73.77 ± 3.72 , respectively; and visual analog scale scores were 6.07 ± 0.78 , 1.93 ± 0.73 and 1.59 ± 0.64 , respectively. As compared with the condition before surgery, there was a significant improvement in the mHHS, International Hip Outcome Tool and visual analog scale scores at 1 and 2 years after surgery. The mHHS score at 2-year follow-up after surgery was higher than that at 1 year after surgery, and the

difference observed was statistically significant. One patient with severe acetabular and femoral cartilage damage underwent total hip replacement 11 months after surgery.

The authors concluded that hip arthroscopy considerably improved hip symptoms and function in Chinese FAI patients aged 50 years or older who did not have severe radiographic osteoarthritis. The conversion to Total Hip Arthroplasty (THA) and complications were low. They felt that strict surgical indications and appropriate surgical strategies laid the foundation for satisfactory post-operative results in elderly patients with FAI.

FAVORABLE OUTCOMES OF REVISION HIP ARTHROSCOPY IRRESPECTIVE OF WHETHER INDEX SURGERY WAS PERFORMED BY THE SAME SURGEON OR A DIFFERENT SURGEON

The authors from Chicago, IL, USA [2] state that the purpose of this study was to compare minimum 2-year patient-reported outcomes measures (PROMs) after revision hip arthroscopy between two different patient cohorts who had undergone primary hip arthroscopy with the same surgeon and a different surgeon. They hypothesized that no difference in clinical outcomes between the groups despite differences in intraoperative findings based on the surgical decision-making in a revision setting at a high-volume center.

Between January 2012 and August 2017, 71 same surgeon patients were matched for age, sex, body mass index and follow-up to 71 different surgeon patients. mHHS, nonarthritic hip score and hip outcome score—sports-specific subscale (HOS-SSS) were collected prospectively. The minimal clinically important difference was calculated for mHHS and HOS-SSS.

All the different surgeon patients had labral tears and 94.4% had FAI from residual bony deformity. The same surgeon and different surgeon groups demonstrated significant and comparable improvement in mHHS ($\Delta = 18.3 \pm 21.5$ versus 19 ± 20.1 ; $P = 0.837$), nonarthritic hip score ($\Delta = 18.8 \pm 18.8$ versus 18.2 ± 18.8 ; $P = 0.850$) and HOS-SSS ($\Delta = 22 \pm 27.4$ versus 17.5 ± 28.1 ; $P = 0.275$). The rates of achieving minimal clinically important difference for mHHS and HOS-SSS were similar. Furthermore, the need for revision surgery and

conversion to total hip arthroplasty were comparable ($P = 0.228$ and $P = 0.383$).

The authors concluded that the patients undergoing revision hip arthroscopy reported notable and comparable improvement in multiple patient-reported outcomes (PRO) at a minimum 2-year follow-up, irrespective of intraoperative findings or primary source of patient pool.

SHORT-TERM OUTCOMES OF HIP ARTHROSCOPY ON HIP JOINT MECHANICS AND CARTILAGE HEALTH IN PATIENTS WITH FAI SYNDROME

In this study, Samaan *et al.* [3] observe that the femoroacetabular acetabular impingement syndrome (FAIS) consists of abnormal hip joint morphology resulting in painful hip joint impingement. Hip arthroscopy corrects the abnormal morphology and reduces clinical symptoms associated with FAIS, yet the effects of hip arthroscopy on gait mechanics and cartilage health are not well understood.

They recruited 10 FAIS patients and 10 matched healthy controls and underwent gait analysis consisting of 3D hip joint kinematics and kinetics. FAIS patients underwent gait analysis and quantitative magnetic resonance imaging of the surgical hip joint before and 7 months after surgery. PRO were used to quantify hip joint pain, function and quality of life and were obtained from all study participants.

No significant differences were observed in hip joint kinematics or kinetics prior to surgery in the FAIS patients compared to healthy controls. After surgery, FAIS patients exhibited improved PRO, similar hip joint kinematic patterns, increased hip flexion moment impulse and decreased hip extension moment impulse within the surgical limb. FAIS patients that ambulated with increased hip flexion moment impulse after surgery demonstrated a decrease in posterior and anterior femoral T1 ρ and T2 values.

The authors concluded that the FAIS patients exhibited improved PRO yet ambulated with altered sagittal plane hip joint loading after hip arthroscopy. Increased hip flexion moment impulse after surgery was associated with improved cartilage health within the surgical limb. They authors interpreted that the study findings suggested that sagittal plane hip joint loading at short-term follow-up after hip arthroscopy is associated with cartilage health and may be an important biomechanical parameter in post-operative rehabilitation programs.

ARTHROSCOPIC TREATMENT OF MILD/BORDERLINE HIP DYSPLASIA (BDH) WITH CONCOMITANT FAI—LITERATURE REVIEW

The authors from Stanford University, Stanford, CA, USA [4] carried out this literature review with aims to survey the current knowledge about the management FAI in the setting of BDH.

The authors state that with better understanding, hip arthroscopy has recently been advocated for treating mild or BDH with concomitant FAI despite early studies that condemned its use. Recent outcome data have demonstrated that hip arthroscopy is a viable option in BDH, with and without FAI, and has been gaining wider acceptance. Hip arthroscopy can address

the concomitant soft tissue and bony intra-articular pathologies and obviate the necessity for other surgeries. Moreover, hip arthroscopy may be used as an adjuvant treatment to other procedures such as a periacetabular osteotomy (PAO).

The authors summarized that hip arthroscopy for BDH is an evolving procedure with promising short- and mid-term outcomes. The combination of BDH and FAI is becoming recognized as a problem in its own right, requiring dedicated treatment.

HIP ARTHROSCOPY AFTER PAO FOR ACETABULAR DYSPLASIA—INCIDENCE AND CLINICAL OUTCOME

In this study, Labouodie *et al.* [5] note that the PAO is the treatment of choice for acetabular dysplasia and has demonstrated improvement in PROMs as well as acceptable long-term survival. However, acetabular dysplasia is also associated with intra-articular lesions that can negatively impact clinical outcome. This study aimed to analyze the incidence, operative findings and outcomes of hip arthroscopy after PAO.

In this single-center retrospective study, the authors queried their hip preservation prospectively collected database from 2006 to 2020. All patients having undergone hip arthroscopy after a PAO, with a minimal follow-up of 1 year, were identified. A total of 202 PAOs were done with a mean age of 28.3 years (12.7–53.6), including 39 males and 167 females. Failure was defined as a conversion to hip replacement. Demographics, surgical findings, reoperations and PROMs (pre- and post-operatively at the last follow-up point only for hips not converted to hip replacement) were recorded.

They identified that 15 hips in 15 patients (7.4%) out of 202 PAOs underwent a hip arthroscopy at a mean time of 3.9 years (0.3–10.3) after PAO. There were 2 males, 13 females and the mean age was 29.8 years (18.5–45). In total, 12 hips had no radiological osteoarthritis (Tönnis 0) and 3 hips had early osteoarthritis (Tönnis 1). At the time of arthroscopy, all hips had a labral tear and nine had a chondral damage \geq Beck 4. Eight hips had labral debridement, seven had labral repair, two had resection of adhesions and four underwent a femoral osteochondroplasty. Four hips (27%) were converted to a hip replacement at a mean time of 1.8 years (0.5–3.2) after hip arthroscopy. Patients converted to hip replacement were significantly older, had a lower post-PAO lateral centre edge angle (LCEA) and a higher post-PAO Tönnis angle. There were no significant improvements in PROMs.

The authors concluded that the study reports a hip arthroscopy reoperation rate after PAO of 7.4%. All three types of dysplasia (uncovered anteriorly, posteriorly or globally) were present in this cohort. In total, 27% of patients were converted to hip replacement and PROMs were not significantly improved by hip arthroscopy. Therefore, this procedure should be approached with some caution.

BIOMECHANICAL EVALUATION OF FOUR SUTURE TECHNIQUES FOR HIP CAPSULAR CLOSURE

The authors from USA and Japan [6] note that the most reliable suture technique for capsular closure after a capsulotomy remains unknown. The aim of their study was to determine

which suture technique best restores native stability after a 5-cm interportal capsulotomy. The study design was that of a controlled laboratory study.

A total of 10 human cadaveric hip specimens were tested using a six-degrees-of-freedom robotic arm in seven states: intact, capsular laxity, 5-cm capsulotomy, standard suture, shoelace, double shoelace and Quebec City slider. Rotational range of motion (ROM) was measured across nine tests: flexion, extension, abduction, abduction at 45° of flexion, adduction, external rotation, internal rotation, anterior impingement and log roll. Distraction (i.e. femoral head translation) was measured across a range of flexion and abduction angles.

When compared with the native state, the 5-cm capsulotomy state showed that the largest laxity increases on all tests, specifically in external rotation ROM (+13.4°), extension ROM (+11.5°) and distraction femoral head translation (+4.5 mm) ($P < 0.001$ for all). The standard suture technique was not significantly different from the 5-cm capsulotomy on any test and demonstrated significantly more flexion ROM than the double shoelace suture (+1.41°) and more extension ROM (+5.51°) and external rotation ROM (+6.03°) than the Quebec City slider. The standard suture also resulted in significantly higher distraction femoral head translation as compared with the shoelace suture (+1.0 mm), double shoelace suture (+1.4 mm) and Quebec City slider (+1.1 mm). The shoelace, double shoelace and Quebec City slider techniques significantly reduced hip laxity when compared with the 5-cm capsulotomy state, specifically in external rotation ROM (respectively, -8.1°, -7.8° and -10.2°), extension ROM (-6.3°, -7.3° and -8.1°) and distraction femoral head translation (-1.8, -2.2 and -1.9 mm). These three techniques restored native stability (no significant

difference from intact) on some but not all tests, and no significant differences were observed among them on any test.

The authors concluded that the hip capsule closure with the standard suture technique did not prevent postoperative hip instability after a 5-cm capsulotomy, and three suture techniques were found to be preferable; however, none perfectly restored native stability at time zero.

CONFLICT OF INTEREST STATEMENT

None declared.

REFERENCES

1. Gao F, Zhang B, Hu B *et al.* Outcomes of hip arthroscopy for femoroacetabular impingement in Chinese patients aged 50 years or older. *Orthop Surg* 2020; **12**: 843–51.
2. Ankem HK, Diulus SC, Kyin C *et al.* Favorable outcomes of revision hip arthroscopy irrespective of whether index surgery was performed by the same surgeon or a different surgeon. *J Am Acad Orthop Surg Glob Res Rev* 2021; **5**: e21.00107.
3. Samaan MA, Grace T, Zhang AL *et al.* Short term outcomes of hip arthroscopy on hip joint mechanics and cartilage health in patients with femoroacetabular impingement syndrome. *Clin Biomech (Bristol, Avon)* 2020; **71**: 214–20.
4. Atzmon R, Safran MR. Arthroscopic treatment of mild/borderline hip dysplasia with concomitant femoroacetabular impingement—literature review. *Curr Rev Musculoskelet Med* 2022; **15**: 300–10.
5. Laboudie P, Dymond T, Kreviazuk C *et al.* Hip arthroscopy after peri-acetabular osteotomy for acetabular dysplasia – incidence and clinical outcome. *BMC Musculoskelet Disord* 2022; **23**: 659.
6. Murata Y, Fukase N, Brady AW *et al.* Biomechanical evaluation of 4 suture techniques for hip capsular closure. *Orthop J Sports Med* 2022; **10**: 23259671221089946.