

What the papers say

Ali Bajwa*

Villar Bajwa Practice, The Princess Grace Hospital, 30 Devonshire Street, London W1G 6PU, UK

*Corresponding author: Ali Bajwa. E-mail: enquiries@villarbajwa.com

The *Journal of Hip Preservation Surgery* (JHPS) 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 JHPS 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, to give them what JHPS 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 ...

SPECIFICITIES IN THE STRUCTURE OF THE CARTILAGE OF PATIENTS WITH ADVANCED STAGES OF DEVELOPMENTAL DYSPLASIA OF THE HIP

In this study, Duvančić *et al.* [1] note that the developmental dysplasia of the hip (DDH) presents varying degrees of femoral head dislocation, with severe cases leading to the formation of a new articular surface on the external side of the iliac bone—the neoacetabulum. Despite conventional understanding suggesting otherwise, a tissue resembling hyaline cartilage is found in the neoacetabulum and acetabulum of Crowe III and IV patients, indicating a potential for hyaline cartilage development without mechanical pressure. To test this theory, acetabular and femoral head cartilage obtained from patients with DDH was stained with hematoxylin–eosin and toluidine blue. The immunohistochemical analysis for collagen types II and VI and aggrecan was performed, as well as delayed gadolinium-enhanced MRI of cartilage analysis on a 7.0 T micro-MRI machine. The results obtained from DDH patients were compared to those of the control groups. Hyaline cartilage was found in the neoacetabulum and the acetabulum of patients with DDH. The nature of the tissue was confirmed with both the histological and the MRI analyses. The results of this study proved the presence of hyaline cartilage in patients with DDH at anatomical regions genetically predisposed to be bone tissue and at regions that are not subjected to mechanical stress. The authors believe that it is the first time that the neoacetabular cartilage of

patients with advanced stages of DDH has been characterized in detail.

ASSOCIATION OF 5 YEAR HIP ARTHROSCOPY OUTCOMES WITH HIP MORPHOLOGY AND CARTILAGE STATUS AT TIME OF SURGERY: A NATIONAL REGISTRY STUDY WITH HAGOS OUTCOMES IN 281 PATIENTS WITH FEMOROACETABULAR IMPINGEMENT SYNDROME

The authors from Denmark [2] remark that the effects of specific bony hip morphologies, cam and dysplasia and cartilage damage on mid- and long-term (≥ 5 years) patient-reported outcomes (PROs) are understudied. They proposed to investigate if changes in PROs from preoperatively to 5 years after hip arthroscopy are associated with preoperative bony hip morphology and cartilage status in patients with femoroacetabular impingement syndrome.

In this cohort study, the patients were identified in the Danish Hip Arthroscopy Registry. Hip and groin function was assessed from preoperatively to 5 years postoperatively with the Copenhagen Hip and Groin Outcome Score (HAGOS) Activities of Daily Living (ADL) and Sports and Recreation (Sport) subscales. Morphology was defined using the anterior alpha angle (AA) and lateral center-edge angle (LCEA) as follows: mild to moderate cam ($55^\circ \leq AA < 78^\circ$), severe cam ($AA \geq 78^\circ$), pincer ($LCEA > 39^\circ$) and borderline dysplasia ($20^\circ \leq LCEA < 25^\circ$). Joint space width (JSW) was defined as slightly reduced ($3.1 \text{ mm} \leq JSW \leq 4 \text{ mm}$) or severely reduced ($2.1 \text{ mm} \leq JSW \leq 3 \text{ mm}$). Acetabular cartilage status was defined by modified Beck grades 0–4 and femoral head cartilage status by International Cartilage Regeneration & Joint Preservation Society grades 0–4. Acetabular and femoral cartilage injury areas were categorized as <1 , $1\text{--}2$, or $>2 \text{ cm}^2$. Multiple regression analyses assessed adjusted associations between hip morphology and cartilage injuries with improvement in HAGOS-ADL and HAGOS-Sport. The study included 281 patients (age, 35 ± 10 years; 52.3% female). No cam and mild-to-moderate cam were associated with greater improvement in HAGOS-ADL (16 points [$P = 0.002$] and 7 points

[$P = 0.038$], respectively) compared with severe cam. Normal JSW was associated with greater improvement in HAGOS-ADL (21 points; $P = 0.026$) compared with severely reduced JSW. Femoral head cartilage injury area $<1 \text{ cm}^2$ was associated with greater improvements in HAGOS-ADL (17 points; $P = 0.03$) and HAGOS-Sport (21 points; $P = 0.035$) compared with femoral cartilage injury area $>2 \text{ cm}^2$.

The authors noted that the patients having no-to-moderate cam morphology, normal JSW or femoral head cartilage injury area $<1 \text{ cm}^2$ had greater improvement in PROs 5 years after hip arthroscopy compared with patients having severe cam morphology, severely reduced JSW or femoral cartilage injury area $>2 \text{ cm}^2$.

ASSOCIATION BETWEEN CHONDROLABRAL JUNCTION BREAKDOWN AND CONVERSION TO TOTAL HIP ARTHROPLASTY AFTER HIP ARTHROSCOPY FOR SYMPTOMATIC LABRAL TEARS: MINIMUM 8-YEAR FOLLOW-UP

The authors from the United States of America [3] state that the arthroscopic treatment of femoroacetabular impingement (FAI) and symptomatic labral tears confers short- to midterm benefits, yet further long-term evidence is needed. Moreover, despite the physiological and biomechanical significance of the chondrolabral junction (CLJ), the clinical implications of damage to this transition zone remain understudied.

The purpose of their study was, first, to report minimum 8-year survivorship and patient-reported outcome measures after hip arthroscopy for FAI and, secondly, to characterize associations between outcomes and patient characteristics (age, body mass index and sex), pathological parameters (Tönnis angle, alpha angle, type of FAI and CLJ breakdown) and procedures performed (labral management, FAI treatment and microfracture).

This retrospective cohort study included patients who underwent primary hip arthroscopy for symptomatic labral tears secondary to FAI by a single surgeon between 2002 and 2013. All patients were ≥ 18 years of age with minimum 8-year follow-up and available preoperative radiographs. The primary outcome was conversion to total hip arthroplasty (THA), and secondary outcomes included revision arthroscopy, patient-reported outcome measures and patient satisfaction. CLJ breakdown was assessed using the Beck classification. Kaplan–Meier estimates and weighted Cox regression were used to estimate 10-year survivorship (no conversion to THA) and identify risk factors associated with THA conversion.

In this study of 174 hips (50.6% female; mean age, 37.8 ± 11.2 years) with a mean follow-up of 11.1 ± 2.5 years, the 10-year survivorship rate was 81.6% (95% CI, 75.9–87.7%). Conversion to THA occurred at a mean of 4.7 ± 3.8 years postoperatively. Unadjusted analyses revealed several variables significantly associated with THA conversion, including older age; higher body mass index; higher Tönnis grade; labral debridement; and advanced breakdown of the CLJ, labrum or articular cartilage. Survivorship at 10 years was inferior in patients exhibiting severe (43.6%) versus mild (97.9%) breakdown of the CLJ. Multivariable analysis identified worsening CLJ breakdown (weighted hazard ratio per 1-unit increase), 6.41; older

age 1.09 and higher Tönnis grade 4.59 as independent negative prognosticators for all.

The authors noted that although most patients achieved favorable minimum 8-year outcomes, several pre- and intraoperative factors were associated with THA conversion; of these, worse CLJ breakdown, higher Tönnis grade and older age were the strongest predictors.

OUTCOMES OF ISOLATED ENDOSCOPIC GLUTEAL TENDON REPAIR COMPARED WITH CONCOMITANT ENDOSCOPIC GLUTEAL TENDON REPAIR AND ARTHROSCOPIC HIP LABRAL REPAIR: A PROPENSITY-MATCHED ANALYSIS WITH MINIMUM 2-YEAR FOLLOW-UP

In the study, Larson *et al.* [4] state that both gluteal and labral tears are common sources of hip pain, but no studies have evaluated how concomitant arthroscopic labral repair and correction of femoroacetabular impingement syndrome (FAIS) affect outcomes after endoscopic gluteus/minimus repair.

The purpose of their study was to compare patient-reported outcomes (PROs) and clinically significant outcomes achievements between patients who underwent endoscopic gluteus medius/minimus and arthroscopic hip labral repair with correction of FAIS versus endoscopic gluteus medius/minimus repair without labral repair. Secondly, the aimed to define threshold scores required to achieve the minimal clinically important difference (MCID) and the Patient Acceptable Symptom State (PASS) for the Hip Outcome Score–Activities of Daily Living, Hip Outcome Score–Sports Specific, modified Harris Hip Score (mHHS), 12-item International Hip Outcome Tool and visual analog scale for pain in these patients.

Patients who underwent primary endoscopic gluteus medius/minimus repair between 2012 and 2020 were identified. Those who underwent concomitant arthroscopic labral repair and correction of FAIS with femoroplasty or acetabuloplasty as indicated were propensity matched in a 1 to 1 ratio by sex, age and body mass index to patients who underwent gluteus medius/minimus repair without labral repair. Patients who completed the study PROs were assessed preoperatively and at 2 years postoperatively. Threshold scores required to achieve the MCID and PASS thresholds were calculated.

A total of 32 patients who underwent simultaneous gluteal and labral repair (G + L) were matched to 32 patients who underwent gluteal repair without labral repair (G); 75% of patients in the G cohort underwent labral debridement, while 25% in this cohort received no labral treatment. A significant difference was observed between groups in preoperative mHHS scores (G + L, 54.4 versus G, 46.3) but no differences in any other PRO scores. The MCID/PASS thresholds were as follows: Hip Outcome Score–Activities of Daily Living (11.14/83.82), Hip Outcome Score–Sports Specific (16.07/59.72), mHHS (11.47/70.95), 12-item International Hip Outcome Tool (13.73/45.49) and visual analog scale for pain (14.30/22). There were no significant differences in MCID or PASS achievement rates between the two groups.

The authors concluded that the patients who underwent combined G + L demonstrated comparable PROs and clinically significant outcomes achievement rates to patients who underwent G, highlighting sustained successful outcomes for patients with gluteal tendon pathology and concomitant FAIS and labral tears.

DEPRESSION SCORES DECREASE AFTER HIP ARTHROSCOPY FOR FEMOROACETABULAR IMPINGEMENT SYNDROME

In this study, Zacharias *et al.* [5] evaluate clinical depression scores and functional outcomes following arthroscopic treatment of femoroacetabular impingement syndrome in patients with elevated preoperative depressive symptoms as defined by Patient-Reported Outcomes Measurement Information System for Depression (PROMIS-D).

Patients with femoroacetabular impingement syndrome completed the PROMIS-D Computer Adaptive Test and additional patient-reported outcome (PRO) measures preoperatively and at the time of postoperative visits. Patients were categorized into preoperative clinically depressed (CD) and nonclinically depressed (NCD) groups based on preoperative PROMIS-D scores. Scores ≥ 55 correlate to mild clinical depression, and this cutoff was used to determine preoperative depression status. PROMIS-D scores and functional outcome scores were assessed at 6 months and a minimum of 1 year postoperatively.

In total, 100 patients were included with complete PROs at a minimum of 1-year follow-up. Of those included, 21 (21%) were categorized with preoperative CD. There were no differences in demographic or radiographic variables between the preoperative CD and NCD groups. At 6 and 12 months postoperatively, the percentage of patients in the preoperative CD group with continued depression was 33.3% and 23.8%, respectively. Overall, 1-year change in the PROMIS-D score for the CD group was -9.1 versus -0.8 in the NCD group ($P = 0.001$). There was no significant difference in rates of patients achieving the patient-acceptable symptom state between the preoperative CD and NCD groups.

The authors thus concluded that the patients with symptoms of preoperative CD, as defined by the PROMIS-D score, demonstrated significant improvement in depressive symptoms following hip arthroscopy. In addition, patients with CD preoperatively did not show decreased rates of achieving the minimum clinically important difference or patient-acceptable symptom state on postoperative PROs compared with patients with NCD.

HIP ARTHROSCOPY DEBRIDEMENT COMBINED WITH MULTIPLE SMALL-DIAMETER FAN-SHAPED LOW-SPEED DRILLING DECOMPRESSION IN THE TREATMENT OF EARLY AND MIDDLE STAGE OSTEONECROSIS OF THE FEMORAL HEAD: 14 YEAR FOLLOW-UP

The authors from China [6] note that osteonecrosis of the femoral head (ONFH) is a disease that occurs frequently in young and middle-aged people. Because of its high disability rate,

it affects the ability to work, so the early treatment of this disease is particularly important. This retrospective study aimed to evaluate the clinical efficacy of hip arthroscopy combined with multiple small-diameter fan-shaped low-speed drilling decompression (MSFLD) in treating early-mid stage ONFH (ARCO II-III A) compared to MSFLD, with at least 10-year follow-up.

A total of 234 patients who underwent hip arthroscopy and MSFLD for ONFH from 1998 to 2012 were analyzed retrospectively. This study enrolled patients between 18 and 60 years old with ARCO stage II-III A, diagnosed clinically and through imaging, in accordance with the 2021 guidelines for the treatment of ONFH. Clinical data, including demographics, operation mode, BMI, pre- and postoperative Harris score and femoral head survival rate, were collected. Patients were divided into hip arthroscopy + MSFLD and MSFLD groups based on the operation mode. The *t*-test was used to compare the postoperative efficacy, Harris scores and survival rates of the femoral head between the two groups.

Among the 234 patients, 160 cases were followed up, including 92 cases in the hip arthroscopy + MSFLD group and 68 cases in the MSFLD group, the follow-up rate was 68.38% and the mean follow-up time was 14.11 ± 3.06 years. The Harris score (80.65 ± 6.29) in the hip arthroscopy + MSFLD group was significantly higher than that in the MSFLD group ($P = 0.00$), and the survival rate of the femoral head (5-year survival rate was 84.78%, 10-year survival rate was 23.91%) was also higher than that in the MSFLD group (5-year survival rate was 63.24%, 10-year survival rate was 8.82%). The 5- and 10-year survival rates of patients with ARCO II were 82.11% and 28.42%, which were better than 54% and 33% for ARCO III A. The femur head survival rate of alcoholic ONFH (5-year survival rate was 61.54%, 10-year survival rate was 9.23%) was significantly higher than that of other types of ONFH.

The authors concluded that the clinical follow-up of at least 10 years suggests that hip arthroscopy combined with MSFLD is an effective treatment for early-mid stage ONFH, with good clinical effects and high survival rates of the femoral head.

CONFLICT OF INTEREST STATEMENT

None declared.

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