Preoperative Symptom Duration Is Associated With Outcomes After Hip Arthroscopy

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Background: Prolonged disease chronicity has been implicated as a cause of suboptimal clinical outcomes after hip arthroscopy for femoroacetabular impingement syndrome (FAIS), possibly due to disease progression, deconditioning, and the development of compensatory pathomechanics.

Purpose: To evaluate the effect of increasing duration of preoperative symptoms on patient-reported outcomes, reoperation, and clinical failure of hip arthroscopy for FAIS.

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

Methods: A retrospective cohort study was performed to identify all patients undergoing primary hip arthroscopy between January 1, 2012, and July 30, 2014, by a single surgeon, with minimum follow-up of 2 years. Patient demographics, comorbid medical conditions, and preoperative outcome scores were compared between patients with preoperative symptoms lasting less than 2 years and those with symptoms lasting 2 years or longer. Multivariate regressions were used to compare Hip Outcome Score Activities of Daily Living (HOS-ADL), Hip Outcome Score Sport-Specific (HOS-SS), and modified Harris Hip Score (mHHS) between the 2 cohorts at 2 years of follow-up.

Results: A total of 624 patients were included, with an average age of 34.0 ± 13.5 years; 235 (37.7%) patients had experienced preoperative symptoms 2 years or longer. Patients with symptoms lasting less than 2 years had statistically significant higher outcome scores than those with symptoms lasting 2 or more years for the HOS-ADL (86.3 ± 16.4 vs 80.3 ± 19.9, respectively), HOS-SS (75.0 ± 25.3 vs 65.1 ± 29.0), and mHHS (79.1 ± 16.6 vs 74.0 ± 18.8), as well as higher satisfaction (82.1 ± 30.7 vs 71.1 ± 31.6) and lower pain scores (2.6 ± 2.3 vs 3.5 ± 2.6). On multivariate analysis, patients with symptoms 2 years or longer had significantly higher visual analog scale–Pain score ($\beta = 0.6$, $P = .039$) and lower HOS-ADL ($\beta = -3.4$, $P = .033$), HOS-SS ($\beta = -6.3$, $P = .012$), and satisfaction ($\beta = -6.7$, $P = .028$) at 2-year follow-up. Patients with longer duration of symptoms also demonstrated less improvement in HOS-SS ($\beta = -10.3$, $P = .001$) at 2 years after surgery. Patients with symptoms for 2 years or longer were significantly less likely to achieve a patient acceptable symptomatic state for HOS-ADL (relative risk [RR] = 0.8, $P = .024$) and HOS-SS (RR = 0.8, $P = .032$) at 2 years of follow-up. Patients with symptoms 2 years or longer also demonstrated significantly higher rates of revision arthroscopy (RR = 10.1, $P = .046$).

Conclusion: Patients with untreated, FAIS-related symptoms lasting 2 years or longer before arthroscopic management had significantly worse patient-reported outcomes and higher rates of reoperation at 2 years after surgery when compared with those patients with a shorter duration of preoperative symptoms.

Keywords: hip arthroscopy; pain; femoroacetabular impingement; duration; outcomes

Over the past 2 decades, hip arthroscopy has been increasingly used as a minimally invasive means of addressing symptomatic femoroacetabular impingement syndrome (FAIS),[2] and this procedure demonstrates reliable improvements in patient-reported pain and function 2 years after surgery.[4] Whereas length of preoperative symptoms has been found to negatively correlate with clinical outcomes after other common orthopaedic procedures such as knee arthroscopy,[14] disease chronicity has received sparse attention as it relates to hip arthroscopy.[1,7,21]

Although it is important for patients to trial nonoperative management before undergoing surgical management, there are concerns that delaying surgery could lead to pathologic compensatory effects such as pelvic floor dysfunction, lumbopelvic abnormalities, and disruption of the kinetic chain.[9,11,15] Additionally, chondrolabral damage may increase, or even accelerate, during the preoperative period,

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contributing to poorer surgical outcomes and the development of secondary osteoarthritis.[23] Although arthroscopic interventions may improve overall symptoms and kinematics of the hip, it remains to be seen whether these improvements alter the natural history and degenerative progression. The purpose of the current study was to determine the association between the duration of preoperative symptoms and outcomes after hip arthroscopy for FAIS. We hypothesized that patients with preoperative pain and other clinical symptoms for 2 years or longer before hip arthroscopy would experience diminished relief and less improvement in primary outcomes including clinical symptoms, satisfaction, and pain, with relatively similar rates of secondary outcomes including reoperation.

METHODS

After institutional review board approval was received (IRB No. 12022108-IRB01, Hip Injury and Arthritis Repository), a retrospective review of a prospectively gathered clinical repository for the senior surgeon (S.J.N.) was performed to identify all patients undergoing primary hip arthroscopy for FAIS between January 1, 2012, and July 30, 2014. Surgical indications were applied to patients with recalcitrant hip or groin pain with corresponding imaging indicative of cam, pincer, or combined FAIS and positive clinical physical examination findings of impingement testing, which remained unresponsive to a course of nonoperative management (eg, physical therapy, activity modification). Relative contraindications were Tönnis grades higher than 1 or less than 2 mm of joint space on standing plain anteroposterior (AP) radiographs. Exclusion criteria were revision surgeries, congenital hip conditions, prior surgical intervention, primary complaints of instability, concomitant periacetabular osteotomy, and iliopsoas release or lengthening.

Surgical Technique

All procedures were performed by a single, senior author (S.J.N.) at a tertiary referral center. The surgical technique has been previously reported and is summarized briefly.[22] Patients were positioned supine on a traction table, and standard anterolateral and midanterior portals were established under traction. An interportal capsulotomy was performed between the 2 portals, and diagnostic arthroscopy was performed. The following steps occurred as indicated: acetabuloplasty was performed with a 5.5-mm bur to correct pincer deformities; labral tear repair was achieved with 2 or 3 suture anchors passed in simple suture configuration using a "pierce through" technique and tied or selectively debrided until a stable labrum remained. Microfracture of the femoral head or acetabulum was performed with an awl for discrete high-grade chondral lesions after chondroplasty and debridement to a stable rim. Traction was released, a T-capsulotomy was performed to expose the cam deformity, and femoral osteochondroplasty was performed to restore the native head-neck offset. Bony resection was performed under fluoroscopic guidance, and dynamic arthroscopic examination under imaging was used to confirm the absence of residual bony impingement.

Intraoperative surgical data were recorded for all of the patients, including the performance of labral repair or debridement, femoral osteochondroplasty, acetabuloplasty or pincer resection, peritrochanteric bursectomy, microfracture, and/or capsular plication. Trochanteric bursectomy was performed in patients with recalcitrant trochanteric bursitis despite a course of nonoperative treatment with rest, activity modification, oral antiinflammatories, oral or injected corticosteroids, and/or focused physical therapy.

Rehabilitation Protocol

Patients were limited to 20-lb flat-foot weightbearing with crutch assistance and motion from 0° to 90° of flexion with a hip orthosis for 3 weeks postoperatively. Night splints to control foot rotation were used for the first month to facilitate labral and capsular healing. During this time, external rotation was limited to 30° while at 90° of hip flexion and to 20° while prone, but early circumduction was permitted. Patients were instructed to avoid active lifting of the surgical extremity and sitting longer than 30 minutes at a time during this acute postoperative phase. Physical therapy was initiated on postoperative day 1 with focus on motion initiation, accomplished thereafter by 4 hours per day of continuous passive motion machine use or 2 hours per day on a stationary bike.

Physical therapy focused on soft tissue mobilization, isometrics, and stretching, with the goal of symmetric hip range of motion by 6 to 8 weeks postoperatively. No active open kinetic chain hip flexor activation was performed at this time. After 3 weeks postoperatively, the patient could discontinue use of crutches and begin to fully bear weight as tolerated. Exercises were advanced as ambulation was progressed. Finally, more functional exercises in all planes were introduced, exercises were advanced, and functional strength and muscular control were highlighted with a goal of initial return to sport between 4 and 6 months postoperatively.

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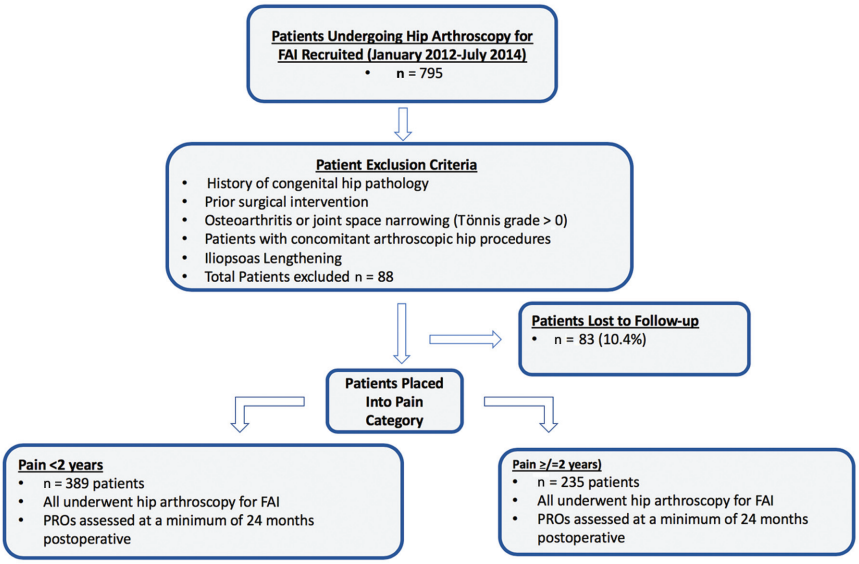

Figure 1. PRISMA (Preferred Reporting Items for Systematic Reviews and Meta-Analyses) flowchart of patient recruitment and follow-up. FAI, femoroacetabular impingement; PRO, patient-reported outcome.

Data Collection

Patient demographics and comorbidities were collected, including age, body mass index, sex, smoking status, and performance of regular exercise. A Charlson Comorbidity Index (CCI) was generated from patient comorbidities as described previously in the literature,[6] and this was used as proxy to control for a patients' medical comorbidities during subsequent analyses.

Radiographic parameters were assessed for each patient. Plain radiographs were performed at baseline and final follow-up. All patients underwent AP, false profile, and Dunn lateral views in the supine position. Lateral center edge angle of Wiberg, Tönnis grade of osteoarthritis, and alpha angle were measured on these radiographs by the senior author as previously described.[22]

All patients completed hip-specific outcome instruments including the Hip Outcome Score Activities of Daily Living (HOS-ADL) and Sport-Specific (HOS-SS) subscales,[18,19] modified Harris Hip Score (mHHS),[3,10] and patient-determined satisfaction and pain score (1-10 visual analog scale [VAS]).

As previously described,[5] the patient acceptable symptomatic state (PASS) was used to determine a clinically significant improvement in HOS-ADL, HOS-SS, and mHHS. PASS was assessed at 2 years postoperatively, and cutoffs were 87 for HOS-ADL, 75 for HOS-SS, and 74 for mHHS.[5] Perioperative complications and subsequent revision hip arthroscopy and/or conversion to total hip arthroplasty were recorded.

A receiver operating characteristic (ROC) curve analysis was performed to identify a cutoff value for chronic versus nonchronic preoperative pain. Because multiple outcomes were assessed and ROC curves are generated for binary outcomes, ROC curves were generated for the following variables: preoperative symptom duration and PASS HOS-ADL, PASS HOS-SS, PASS mHHS, revision arthroscopy, and total hip arthroplasty. These values were 24.5 months, 24.5 months, 22.5 months, 35.5 months, and 28.5 months, respectively. A mean cutoff of 24 months was used in this study based on the binary outcomes generated (Appendix Figure A1, available in the online version of this article).

Statistical Analysis

Statistical analyses were conducted by use of Stata version 13.1 (StataCorp, LP). Chi-square analyses were used to compare patients with preoperative pain duration less than 2 years versus those with preoperative symptoms lasting 2 years or longer. A multivariate Poisson regression with robust error variance controlling for patient demographics (age, sex), sport activity, smoking, and disease severity (Tönnis grade, lateral center edge angle, alpha angle, presence of femoral chondral lesions) was used to identify independent association with increased preoperative symptom duration (pain $\geq$2 years) and each categorical outcome measure, with pain less than 2 years as the reference. Similarly, multivariate linear regression was used for continuous data. All statistical tests were 2-tailed, and the statistical difference was established at a 2-sided α level of .05 ($P < .05$).

RESULTS

Demographic Variables, Baseline Radiographic Parameters, and Outcome Measures

From December 2015 to July 2015, a total of 624 patients were identified who had a minimum of 2-year reported outcomes and met inclusion and exclusion criteria (Figure 1). The mean $\pm$ SD age of the cohort was 34.0 $\pm$ 13.5 years,

TABLE 1
Patient Characteristics[a]

	Patients With Pain <2 Years	Patients With Pain ≥2 Years	All Patients	*P* Value
No. of patients	389	235	624	
Demographics/comorbidities				
Age, y	33.0 ± 13.2	35.5 ± 13.9	34.0 ± 13.5	**.025**
Body mass index	24.8 ± 4.5	25.7 ± 5.5	25.2 ± 4.9	.050
Female, %	62.5	69.8	65.2	.063
Charlson Comorbidity Index	0.7 ± 1.3	1.0 ± 1.9	0.8 ± 1.6	**.025**
Smoking, %	8.0	10.1	8.7	.370
Regular exercise, %	73.8	68.1	71.6	.126
Low back pain, %	11.6	12.8	12.0	.656
Radiographic parameters				
Alpha angle, deg	60.5 ± 9.8	61.2 ± 13.1	60.8 ± 11.2	.447
Tönnis ≥1, %	11.8	16.2	13.5	.123
Center edge angle, deg	32.9 ± 6.4	32.9 ± 9.0	32.9 ± 7.5	.912
Preoperative outcome scores				
VAS-Pain	7.4 ± 1.6	7.4 ± 1.7	7.4 ± 1.6	.723
HOS-ADL	65.9 ± 18.9	63.7 ± 19.9	65.0 ± 19.3	.203
HOS-SS	44.0 ± 22.3	46.4 ± 23.6	44.9 ± 22.8	.252
mHHS	57.9 ± 14.2	56.1 ± 14.3	57.2 ± 14.3	.162
Operative findings/procedures, %				
Femoral chondral defect				.060
None	71.5	66.8	69.7	
Grade 1	17.0	18.7	17.6	
Grade 2	0.5	1.7	1.0	
Grade 3	6.4	3.8	5.5	
Grade 4	4.6	8.9	6.3	
Labral repair	90.5	84.6	88.2	**.028**
Labral debridement	95.1	93.2	94.4	.309
Femoral osteochondroplasty	93.3	88.9	91.6	.054
Acetabular rim trimming	81.2	76.5	79.4	.161
Trochanteric bursectomy	9.3	10.7	9.8	.568
Microfracture	2.1	2.1	2.1	.935
Capsular plication	87.4	83.3	85.8	.162

[a]Values are expressed as mean ± SD unless otherwise noted. Bold values are statistically significant ($P < .05$). ADL, Activities of Daily Living; HOS, Hip Outcome Score; mHHS, modified Harris Hip Score; SS, Sport-Specific; VAS, visual analog scale.

and 65.2% of patients were females. The mean body mass index was 25.2 ± 4.9, and 71.6% of patients reported routine physical exercise. Mean CCI was 0.8 ± 1.6, and 8.7% of patients acknowledged active tobacco use.

Among all patients, 235 (37.7%) had antecedent, FAIS-related symptoms lasting longer than 2 years before hip arthroscopy. Comparison of characteristics between symptom duration groups showed that patients with a longer duration of symptoms were older ($P = .025$) and had higher CCI ($P = .025$). Patients with pain for 2 years or longer had labral repairs intraoperatively at a lower rate than those patients with symptoms lasting less than 2 years ($P = .028$) (Table 1).

Bivariate Analysis

Bivariate analyses were next performed to compare 2-year postoperative outcomes between symptom duration groups (Table 2). The absolute and net differences in all patient-reported outcome measures were evaluated at baseline preoperative and 2-year postoperative time points. Relative to patients with symptom duration less than 2 years, patients with symptoms for 2 years or longer had significantly increased postoperative VAS-Pain score and decreased HOS-ADL, HOS-SS, and mHHS at 2 years after hip arthroscopy ($P < .001$ for all). Similarly, patients with symptoms for 2 years or longer had statistically significantly decreased improvement in VAS-Pain ($P = .027$) and HOS-SS ($P = .002$) at 2 years after surgery. Patients with symptoms for 2 years or longer had lower satisfaction at 2 years.

Bivariate analysis of binary outcomes (Table 3) showed that patients with symptoms for 2 years or longer had significantly decreased rates of achieving PASS at 2 years for HOS-ADL ($P < .001$), HOS-SS ($P = .001$), and mHHS ($P = .002$), as well as increased rates of revision arthroscopy (3.7% vs 0.3%, $P = .002$) and conversion to total hip arthroplasty (6.4% vs 0.6%, $P < .001$).

Multivariate Analysis

After multivariate adjustment (Table 4), patients with preoperative symptoms for 2 years or longer had significantly

TABLE 2
Two-Year Outcomes, Bivariate Analyses[a]

	Patients With Pain <2 Years	Patients With Pain ≥2 Years	All Patients	*P* Value
Outcomes at 2 years				
VAS-Pain	2.6 ± 2.3	3.5 ± 2.6	3.0 ± 2.5	**<.001**
HOS-ADL	86.3 ± 16.4	80.3 ± 19.9	84.1 ± 18.0	**<.001**
HOS-SS	75.0 ± 25.3	65.1 ± 29.0	71.3 ± 27.1	**<.001**
mHHS	79.1 ± 16.6	74.0 ± 18.8	77.2 ± 1.6	**<.001**
VAS-Satisfaction	82.1 ± 30.7	71.1 ± 31.6	78.0 ± 31.5	**<.001**
Change from preoperative to 2 years postoperative				
ΔVAS-Pain	–4.6 ± 2.8	–3.8 ± 3.1	–4.3 ± 2.9	**.027**
ΔHOS-ADL	20.8 ± 19.9	17.3 ± 22.0	19.5 ± 20.8	.052
ΔHOS-SS	31.1 ± 28.8	21.9 ± 31.5	27.5 ± 30.2	**.002**
ΔmHHS	21.3 ± 18.2	18.2 ± 19.5	20.1 ± 18.7	.076

[a]Values are expressed as mean ± SD. Bold values are statistically significant ($P < .05$). ADL, Activities of Daily Living; HOS, Hip Outcome Score; mHHS, modified Harris Hip Score; SS, Sport-Specific; VAS, visual analog scale.

TABLE 3
Results of Bivariate Analyses for Influence of Preoperative Symptom Length on PASS, Revision Arthroscopy, and Conversion to Total Hip Arthroplasty[a]

Outcome	Patients With Pain <2 Years	Patients With Pain ≥2 Years	All Patients	*P* Value
PASS HOS-ADL	64.0	47.7	57.9	**<.001**
PASS HOS-SS	68.4	54.9	63.3	**.001**
PASS mHHS	71.7	60.0	67.3	**.002**
Revision arthroscopy	0.3	3.7	1.5	**.002**
Total hip arthroplasty	0.6	6.4	2.7	**<.001**

[a]Values are expressed as percentages. Bold values are statistically significant ($P < .05$). ADL, Activities of Daily Living; HOS, Hip Outcome Score; mHHS, modified Harris Hip Score; PASS, patient acceptable symptomatic state; SS, Sport-Specific.

TABLE 4
Results of Multivariate Analyses for Influence of Preoperative Symptom Length on 2-Year Outcomes, With Pain Less Than 2 Years as the Reference[a]

Outcome	Beta	*P* Value
VAS-Pain at 2 years	0.6	**.039**
HOS-ADL at 2 years	–3.4	**.033**
HOS-SS at 2 years	–6.3	**.012**
mHHS at 2 years	–1.8	.255
Percentage satisfaction at 2 years	–6.7	**.028**
ΔVAS-Pain at 2 years	0.4	.356
ΔHOS-ADL at 2 years	–3.5	.075
ΔHOS-SS at 2 years	–10.3	**.001**
ΔmHHS at 2 years	–0.8	.653

[a]Bold values are statistically significant ($P < .05$). ADL, activities of daily living; HOS, Hip Outcome Score; mHHS, modified Harris Hip Score; SS, Sport-Specific; VAS, visual analog scale.

TABLE 5
Results of Multivariate Analyses for Influence of Preoperative Symptom Length on Binary Outcomes, With Pain Less Than 2 Years as the Reference[a]

Outcome	Relative Risk	*P* Value
PASS HOS-ADL	0.8	**.024**
PASS HOS-SS	0.8	**.032**
PASS mHHS	0.9	.521
Revision arthroscopy	10.1	**.046**
Total hip arthroplasty	4.2	.075

[a]Bold values are statistically significant ($P < .05$). ADL, activities of daily living; HOS, Hip Outcome Score; mHHS, modified Harris Hip Score; PASS, patient acceptable symptomatic state; SS, Sport-Specific.

higher VAS-Pain score (β = 0.6, $P = .039$) and lower HOS-ADL (–3.4, $P = .033$) and HOS-SS (β = –6.3, $P = .012$) at 2-year follow-up and significantly decreased improvement in HOS-SS (β = –10.3, $P = .001$) at 2 years after surgery. Patients with preoperative symptoms for 2 years or longer also had significantly lower satisfaction at 2-year follow-up ($P = .028$).

Multivariate analysis of binary outcomes (Table 5) revealed that patients with symptoms for 2 years or longer had significantly decreased risk of achieving PASS at 2 years for HOS-ADL (relative risk [RR] = 0.8, $P = .024$) and HOS-SS (RR = 0.8, $P = .032$). Patients with longer

symptom duration also had significantly increased risk of revision arthroscopy within 2 years of the index procedure (RR = 10.1, $P = .046$). No statistically significant differences in conversion to total hip arthroplasty were identified between groups.

DISCUSSION

The principal finding of our study was that despite similarities at baseline, patients with increased duration of symptoms had significantly worse pain and functional outcomes at 2 years compared with those patients with shorter term symptoms. The association between pain duration and disease severity was observed in both bivariate and multivariate analyses. In the current series of 624 patients with arthroscopic management of FAIS, more than a third of patients experienced preoperative hip symptoms for at least 2 years. In addition, patients with longer symptom duration had lower rates of achieving PASS cutoffs for HOS-ADL and HOS-SS. Finally, patients with longer preoperative symptoms had significantly increased risk of revision arthroscopy within 2 years. Although conversion to total hip arthroplasty was also noted to be higher in patients with longer preoperative symptoms on bivariate analysis, this was no longer statistically significant after we controlled for baseline differences with multivariate analysis. Of note, our study had less frequency of labral repair in the group with longer pain duration. This may be due to additional chondrolabral damage resulting in either scarred labrum or an irreparable pattern.

Many health care providers continue to advocate for a comprehensive trial of nonoperative treatment, including activity modification, oral nonsteroidal anti-inflammatory medication, and physical therapy. Given the high prevalence of asymptomatic FAIS and chondrolabral injury among high-risk athletes,[8,13,24] normal anatomic variants (eg, posterior labral cleavage), and the need for reliable interobserver reliability with various diagnostic imaging modalities, patients may often undergo repeat magnetic resonance imaging, magnetic resonance arthrogram, or diagnostic and therapeutic injection before orthopaedic or hip subspecialty referral. Although this workup may ultimately identify intra-articular abnormality, the efficiency and cost-effectiveness of this strategy may be called into question. In an analysis of 78 patients with symptomatic FAIS, Kahlenberg et al[12] showed that patients saw an average of 4 health care providers and underwent an average of 3.4 diagnostic imaging modalities before diagnosis, resulting in significant delays in care and a mean duration of symptoms of approximately 32 months.

The duration of preoperative hip pain was previously posited as a risk factor for early clinical failure after hip arthroscopy.[1,7,16] However, this trend is inconsistently demonstrated across existing systematic reviews,[21] and studies reporting positive associations may be hindered by frequency of concomitant high-grade chondral lesions or arthritic progression,[1,16] selection bias,[7,20] and short-term clinical follow-up.[7,16] Larson and colleagues[16] identified a longer duration of preoperative symptoms as an independent predictor of lower mHHS and failure in patients with Tönnis grade 2 or 3 undergoing hip arthroscopy. Furthermore, Aprato et al[1] and Classen et al[7] documented that symptom chronicity greater than 6 months and 23.5 months, respectively, was significantly associated with worse clinical outcomes after arthroscopic management of FAIS. In a series of professional hockey players undergoing arthroscopic treatment of FAIS, Menge and coauthors[20] revealed that athletes of younger age (25 vs 30 years) and those with shorter duration of symptoms (9.3 vs 20.2 months) had significantly greater career longevity postoperatively. In the current study, which involved a broad-based, physically active group without advanced radiographic arthritis, and with similar baseline demographics between cohorts, patients with symptoms lasting 2 years or longer had significantly worse outcomes on the HOS-SS and less improvement on the VAS-Pain score and HOS-ADL. In addition to assisting with preoperative patient counseling and risk stratification for suboptimal clinical outcomes, these data may encourage earlier patient referrals or closer patient surveillance to assess for symptomatic improvement during short-term trials of nonoperative treatment.

Traditional means of assessing clinical outcomes in patients with hip preservation have prioritized objective radiographic measurements and survivorship from conversion arthroplasty. The more recent patient-centered focus has emphasized the importance of not only statistically significant improvements on validated, patient-reported outcome measures but also clinically meaningful differences based on established values for minimal clinically important difference. The latest paradigm has shifted to establish absolute thresholds on patient-reported outcomes, or PASS values, that are commensurate with patient satisfaction after hip arthroscopy.[5,17] Using benchmarks proposed by Chahal et al,[5] the present study showed that patients with symptoms lasting 2 years or longer had a 20% lower rate of achieving an acceptable outcome in their postoperative activities of daily living and sporting involvement based on their respective HOS subscales at 2-year follow-up.

Limitations

The present study carries several limitations consistent with a retrospective review of a surgical database. The risk of confounding or selection bias is present but is mitigated by small, although statistically significant, differences between baseline patient cohorts for age and CCI. We cannot exclude the potential for surgeon bias, where a treating physician is subconsciously less likely to offer surgery to a suboptimal surgical candidate with more protracted symptoms due to comorbid disease (eg, obesity), atypical presentation, concomitant lumbopelvic dysfunction, or other undisclosed factors. Patients with prolonged preoperative symptoms may be at heightened risk for progressive chondrolabral disease with articular cartilage delamination, subchondral bone remodeling, and, potentially, early development of osteoarthritis. Prolonged

disease may not only adversely affect baseline level of function but also diminish the potential for improvement to a symptom-free state without short- to mid-term reoperation. Despite this potential risk, statistically significant differences in the rates of femoral chondral lesions were not seen between our cohorts. Preoperative data that were not gathered included acetabular chondral defect grading, which was not routinely recorded in the operative report and was unavailable for assessment. Disease chronicity is often associated with a significant psychological overlay and mental health conditions that were not well controlled for in this study. The time to return to preoperative activity was not assessed in the current investigation, and data were not stratified by the athletic involvement or preinjury levels of activity. Finally, although all patients included in the study had a primary diagnosis of FAIS and the preoperative pain duration represents pain from FAIS, in the small subset of patients with trochanteric bursectomy, some symptomatic improvement may be related to the bursectomy.

CONCLUSION

Patients with untreated, FAIS-related symptoms lasting 2 years or longer before arthroscopic management had significantly worse patient-reported outcomes, fewer improvements in pain and function, and less likelihood of achieving an acceptable outcome at short-term follow-up after hip arthroscopy. Patients with symptoms for 2 years or longer had a 20% lower rate of achieving an acceptable outcome in postoperative activities of daily living and sport involvement at 2-year follow-up after we controlled for other factors. Additionally, these patients were at significantly increased risk of revision hip arthroscopy within 2 years. Preoperative patient counseling should reflect suboptimal clinical results with greater disease chronicity among a physically active patient demographic with symptomatic FAIS.

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