Long-Term Outcomes Following Hip Arthroscopy for Femoroacetabular Impingement Syndrome in Preoperative Intraarticular Injection Responders and Non- Responders

Jose Francisco Vega, Eric Hu, Jesus Emanuel Cervantes, Shane Jay Nho

INTRODUCTION: Preoperative intraarticular cortisone (IACS) injections have been utilized as diagnostic tools to isolate intra-articular hip pain. Prior studies examining how the degree of pain relief affects outcomes have been mixed and limited to short-term follow-up. Thus, the purpose of this study is to compare 10-year patient-reported outcomes (PROs), achievement of clinically significant outcomes (CSOs), and reoperation-free survivorship between patients who responded to IACS injections to those who had no response to IACS injections after contemporary hip arthroscopy for FAIS.

METHODS: Retrospective review of patients undergoing primary hip arthroscopy between January 2012 to August 2014. Patients who received a preoperative IACS injection were divided based on whether they had symptomatic relief (responder group) or no relief (non-responder group). These groups were propensity matched in a 1:1 ratio based on age, sex, BMI, acetabular cartilage grade, and Tönnis grade. Demographics, radiographic measures, CSO achievement, and survivorship were compared. PROs were measured preoperatively and at 2-, 5-, and 10-year follow up, which included Hip Outcome Score – Activities of Daily Living (HOS-ADL), Sports Subscale (HOS-SS), Modified Harris Hip Score (mHHS), and Visual Analogue Scale (VAS) for Pain/Satisfaction. Survivorship was calculated utilizing Kaplan Meier survivorship analysis.

RESULTS: Overall, 116 responder patients (age: 36.4 ± 11.4, 67.2% female, BMI: 25.4 ± 4.7 kg/m2) were matched to 116 non-responder patients (age: 36.6 ± 12.8 years; 62.1% female; BMI: 25.4 ± 4.6 kg/m2). No differences between groups were seen between any demographic or radiographic findings. Preoperatively, the responder group had significantly lower VAS-Pain scores compared to the non-responder group (P = 0.006). Otherwise, both groups saw similar outcomes scores for all other PROs preoperatively, and at 2-, 5-, and 10-year follow-up. CSO achievement was also similar between groups, with ≥ 78.8% of all patients achieving either MCID or PASS for ≥1 PRO. Reoperation survivorship was also similar between groups (P = 0.62).

DISCUSSION AND CONCLUSION: Response to intra-articular corticosteroid injection did not affect 10-year clinical outcomes or re-operation rates, despite lower preoperative pain scores in responders. These findings underscore the importance of incorporating clinical history, physical examination, and diagnostic imaging, in addition to injection response, when determining surgical candidacy.

Table 1. Demographics

	IACS Responders 116	IACS Non-Responders 116	p-value
Sample Size (n)			
Follow-up, mean ± SD, y	10.4 ± 0.5	10.5 ± 0.8	0.724
Age, mean ± SD, y	36.4 ± 11.4	36.6 ± 12.8	0.871
BMI, mean ± SD, kg/m2	25.4 ± 4.7	25.4 ± 4.6	0.975
Female, %	67.2	62.1	0.412
Preop Pain >2 Years, %	38.7	33.6	0.342
Back Pain, %	20.7	20.7	1.000
Physically Active Weekly, %	70.2	69.6	0.925
Psychiatric History, %	16.7	15.0	0.545
Recreational Sports, %	66.4	65.5	0.890
Prior Narcotic Prescription, %	21.1	18.1	0.597
Injection Relief Duration, %			
1	43.2		
Weeks	32.1		
Months	24.7		

BMI: Body mass index. IACS: Intraarticular Corticosteroid

Table 2. Radiographics, Intraoperative Findings, and Operative Procedures

	IACS Responders	IACS Non-Responders	p-value
	Preoperative		
LCEA, mean ± SD, °	31.2 ± 6.4	30.5 ± 5.6	0.395
Alpha Angle, mean ± SD, °	62.9 ± 11.4	62.9 ± 13.9	0.985
Tönnis Grade, %			0.849
0	87.1	85.3	
1	12.9	14.7	
	Postoperative		
LCEA, mean ± SD, °	28.5 ± 5.4	28.1 ± 5.4	0.794
Alpha Angle, mean ± SD, °	38.2 ± 4.5	38.0 ± 4.8	0.200
	Intraoperative Findings		
Beck's Grade (Acetabulum), %			1.000
0-2	85.3	86.2	
3-4	14.7	13.8	
ICRS Grade (Femur), %			1.000
0-2	96.5	96.5	
3-4	3.5	3.5	
	Operative Procedures		
Femoroplasty, %	99.1	99.1	1.000
Labral Repair, %	95.7	95.9	0.500
Capsular Plication, %	99.1	97.4	1.000
Microfractures, %	2.5	1.8	0.685

IACS: Intraarticular Corticosteroid. LCEA: Lateral center edge angle. ICRS: International Cartilage Repair Society.

Table 3. Patient-Reported Outcomes

	IACS Responders	IACS Non-Responders	p-value
	Preoperative		
HOS-ADL	43.9 ± 14.4	45.0 ± 14.6	0.749
HOS-SS	40.0 ± 21.8	45.7 ± 24.6	0.267
mHHS	56.5 ± 14.8	55.9 ± 15.4	0.575
VAS Pain	48.4 ± 17.5	54.6 ± 17.2	**0.006**
	2-Year		
HOS-ADL	84.5 ± 16.8	86.6 ± 18.4	0.767
HOS-SS	69.1 ± 27.3	70.1 ± 27.8	0.648
mHHS	76.7 ± 18.5	77.4 ± 16.4	0.902
VAS Pain	23.9 ± 25.3	22.9 ± 26.5	0.618
VAS Sat	78.9 ± 27.8	78.9 ± 26.8	0.824
	5-Year		
HOS-ADL	82.1 ± 20.4	81.5 ± 23.3	0.626
HOS-SS	68.3 ± 28.6	71.5 ± 26.9	0.433
mHHS	74.9 ± 22.4	77.6 ± 19.4	0.657
VAS Pain	29.3 ± 28.2	30.1 ± 31.8	0.984
VAS Sat	74.1 ± 33.2	74.8 ± 33.4	0.746
	10-Year		
HOS-ADL	86.3 ± 16.8	83.7 ± 19.6	0.637
HOS-SS	73.8 ± 24.5	72.4 ± 28.0	0.755
mHHS	76.4 ± 16.8	77.4 ± 15.7	0.709
VAS Pain	19.1 ± 23.3	23.7 ± 25.6	0.341
VAS Sat	89.5 ± 18.8	83.3 ± 28.5	0.354
	Delta (Pre-10-Year)		
HOS-ADL	22.4 ± 17.4	18.4 ± 20.3	0.197
HOS-SS	37.4 ± 35.5	30.4 ± 31.0	0.157
mHHS	19.3 ± 17.4	21.9 ± 16.9	0.372
VAS Pain	-48.6 ± 25.4	-50.0 ± 28.0	0.580

Patient-reported outcome comparisons between intraarticular corticosteroid responders and intraarticular corticosteroid non-responders groups. IACS: Intraarticular corticosteroid. HOS-ADL: Hip Outcome Score – Activities of Daily Living. HOS-SS: Hip Outcome Score – Sports Subscale. mHHS: modified Harris Hip Score. VAS Pain: Visual Analog Scale for Pain. VAS Sat: Visual Analog Scale for Satisfaction. **Bold** typeface indicates statistically significant between groups at $p < 0.05$.

Table 4. Male vs Female IACS Responders Sub-Analysis

	Male IACS Responders (N = 38)	Female IACS Responders (N = 78)	p-value
	Preoperative		
HOS-ADL	65.9 ± 18.3	61.8 ± 20.3	0.299
HOS-SS	42.9 ± 19.1	36.7 ± 24.3	0.164
mHHS	58.5 ± 12.7	54.2 ± 16.7	0.244
VAS Pain	67.5 ± 17.2	60.2 ± 17.8	0.028
	10-Year		
HOS-ADL	86.4 ± 14.1	85.7 ± 17.9	0.454
HOS-SS	77.4 ± 24.7	72.5 ± 30.8	0.452
mHHS	78.9 ± 13.5	75.3 ± 18.0	0.312
VAS Pain	17.1 ± 22.5	20.0 ± 23.5	0.184
VAS Sat	93.8 ± 11.7	87.7 ± 19.9	0.141
	MCID Achievement		
HOS-ADL, %	97.4	89.8	0.142
HOS-SS, %	86.8	77.5	0.325
mHHS, %	72.0	72.7	0.477
VAS Pain, %	91.2	89.5	1.000
Any MCID, %	98.4	95.7	1.000
	PASS Achievement		
HOS-ADL, %	75.0	84.8	0.183
HOS-SS, %	74.1	83.3	0.566
mHHS, %	69.5	65.4	0.802
VAS Pain, %	71.4	74.1	1.000
Any PASS, %	85.2	92.3	0.494

Patient-reported outcomes and clinically significant outcome comparisons between male intraarticular corticosteroid responders and female intraarticular corticosteroid responders groups. IACS: intraarticular corticosteroid. HOS-ADL: Hip Outcome Score – Activities of Daily Living. HOS-SS: Hip Outcome Score – Sports Subscale. mHHS: modified Harris Hip Score. VAS Pain: Visual Analog Scale for Pain. VAS Sat: Visual Analog Scale for Satisfaction. MCID: Minimal Clinically Important Difference. PASS: Patient Acceptable Symptom State. **Bold** typeface indicates statistically significant between groups at $p < 0.05$.

Table 5. Secondary Surgery

	IACS Responders	IACS Non-Responders	p-value
	Reoperation		
Any Reoperation, %	17.3	15.5	0.874
Revision, %	8.6	8.6	0.398
THA, %	12.1	6.9	0.262

IACS: Intraarticular corticosteroid. THA: Total hip arthroplasty.