Patients with Global Acetabular Overcoverage have Inferior Outcomes at 10 Year Follow-up after Hip Arthroscopy for Femoroacetabular Impingement Syndrome

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INTRODUCTION:

Global and focal acetabular overcoverage are subtypes of femoroacetabular impingement syndrome (FAIS) that result in abnormal contact between the femoral head and acetabulum, leading to hip pain and dysfunction. Although hip arthroscopy is a well-established treatment for FAIS, patients with global acetabular overcoverage are considered more challenging due to extensive bony involvement. Previous studies have been limited by inconsistent radiographic definitions and short- to midterm follow-up. This study aims to evaluate 10-year outcomes following hip arthroscopy in patients with global acetabular overcoverage, lateral acetabular overcoverage, and normal acetabular coverage.

METHODS:

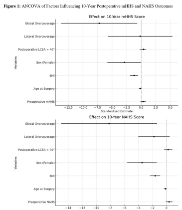
This retrospective cohort study evaluated patients who underwent hip arthroscopy for FAIS between 2010 and 2013, with a minimum follow-up of 10 years. Patients were stratified into three groups based on acetabular morphology: global overcoverage (lateral center-edge angle [LCEA] >40° with coxa profunda), lateral overcoverage (LCEA >40° without coxa profunda), and normal coverage (LCEA 20–40°). Functional outcomes were assessed using the modified Harris Hip Score (mHHS) and Nonarthritic Hip Score (NAHS). Survivorship was defined as freedom from revision arthroscopy or conversion to total hip arthroplasty (THA). Subgroup analyses were performed to identify predictors of outcome, with significance set at $P < 0.05$.

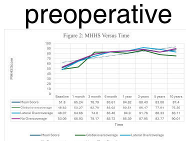
RESULTS:

A total of 163 patients were included, with a mean age of 38.90 ± 12.61 years, BMI of 24.86 ± 4.03, and mean follow-up of 11.63 ± 1.07 years. The cohort comprised 73.6% (120/163) patients with no overcoverage, 17.2% (28/163) with lateral overcoverage, and 9.2% (15/163) with global overcoverage. Revision arthroscopy rates were 0% in the global group, 7.7% in the lateral group, and 5.2% in the no overcoverage group ($P = 0.6799$). THA rates were 0% for global, 12% for lateral, and 8% for no overcoverage ($P = 0.5854$). The global overcoverage group demonstrated significantly lower mHHS ($P = 0.004$) and NAHS ($P = 0.007$) compared to the other groups. Analysis of covariance (ANCOVA) demonstrated that female sex (mHHS $P = 0.05$; NAHS $P = 0.026$), higher BMI (mHHS $P = 0.0006$; NAHS $P < 0.0001$), and global overcoverage (mHHS $P = 0.031$; NAHS $P = 0.019$) were independently associated with worse long-term functional outcomes.

DISCUSSION AND CONCLUSION: At a minimum of 10 years postoperatively, patients with FAIS demonstrated similar survivorship regardless of acetabular coverage subtype. However, those with global acetabular overcoverage experienced significantly worse functional outcomes than patients with lateral or normal coverage, despite no observed increase in reoperation or THA rates. These findings suggest that global overcoverage represents a more challenging phenotype that may require specialized surgical strategies to optimize outcomes. Additionally, patient-specific factors such as female sex and elevated BMI were associated with inferior long-term results, emphasizing the importance of individualized preoperative counseling and risk stratification in this population.

Figure 1: ANCOVA of Factors Influencing 10-Year Postoperative mHHS and NAHS Outcomes





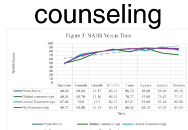


Table 1: Comparison of Patient Demographics, Radiographic Measurements, and Acetabular Pathologies and Management Strategies by Acetabular Overcoverage Category

Acetabular Overcoverage Category		Overall n = 163	None n = 120 (73.62%)	Lateral n = 28 (17.18%)	Global n = 15 (9.2%)	P Value
Demographics						
Age (Years)		38.9 ± 12.61	37.18 ± 11.2	42.65 ± 15.47	45.54 ± 14.5	**0.013**
BMI		24.86 ± 4.03	24.56 ± 3.91	25.65 ± 4.33	25.79 ± 4.36	0.291
Sex	Female	102 (63.6%)	74 (61.7%)	13 (46.4%)	15 (100%)	**0.002**
	Male	61 (37.4%)	46 (38.3%)	15 (53.6%)	0 (0%)	
Laterality	Left	69 (42.3%)	51 (42.5%)	14 (50%)	4 (26.7%)	0.335
	Right	94 (57.7%)	69 (57.5%)	14 (50%)	11 (73.3%)	
Follow-up (Years)		11.63 ± 1.07	11.64 ± 1.09	11.64 ± 1.11	11.52 ± 0.91	0.927
Tönnis Grade	0	97 (59.51%)	74 (61.67%)	14 (50.0%)	9 (60.00%)	0.531
	1	60 (36.81%)	44 (36.67%	12 (42.86%)	4 (26.67%)	0.569
	2	6 (3.68%)	2 (1.67%	2 (7.14%)	2 (13.33%)	0.088
Outerbridge Grade	0	8 (4.91%)	6 (5.0%)	2 (7.14%)	0	0.692
	1	123 (75.46%)	91 (75.83%)	19 (67.86%)	13 (86.67%)	0.37
	2	11 (6.75%)	10 (8.33%)	0	1 (6.67%)	0.113
	3	7 (4.29%)	4 (3.33%)	2 (7.14%)	1 (6.67%)	0.627
	4	14 (8.59%)	9 (7.5%)	5 (17.86%)	0	0.103

Table 2: Comparison of Patient Outcomes by Acetabular Overcoverage Category

Patient Outcomes		Overall, n = 163	None, n = 120 (73.62%)	Lateral, n = 28 (17.18%)	Global, n = 15 (9.2%)	P Value
Baseline	mHHS	51.80 ± 11.61	53.09 ± 11.79	48.07 ± 10.31	48.62 ± 10.99	0.064
	NAHS	49.36 ± 11.48	49.77 ± 12.12	47.68 ± 7.98	49.34 ± 12.3	0.691
10 Year	mHHS	87.39 ± 17.93	90.01 ± 14.12	83.11 ± 21.92	75.35 ± 28.45	**0.004**
	NAHS	85.16 ± 19.34	87.54 ± 15.95	82.98 ± 21.78	71.17 ± 30.59	**0.007**
Met 10-Year mHHS MCID		134/153 (87.58%)	98/112 (87.5%)	24/26 (92.31%)	12/15 (80.0%)	0.515
Met 10-Year NAHS MCID		139/153 (90.85%)	105/112 (93.75%)	23/26 (88.46%)	11/15 (73.33%)	**0.033**
Conversion to THA		11 (6.73%)	8 (8%)	3 (12%)	0 (0%)	0.585
Revision Rate		7 (4.3%)	5/96 (5.2%)	2/26 (7.7%)	0 (0%)	0.679

Table 3: ANCOVA of Factors Influencing 10-Year Postoperative mHHS and NAHS Outcomes

			Mean ± SD	Estimate	Confidence Interval	P Value
Sex	mHHS	Male	91.27 ± 15.38	-2.88	-5.82, 0.06	**0.05**
		Female	85.22 ± 18.95			
	NAHS	Male	89.39 ± 16.75	-3.49	-6.55, -0.42	**0.026**
		Female	82.79 ± 20.36			
BMI (continuous Variable)	mHHS			-1.22	-1.91, -0.53	**0.0006**
	NAHS			-1.61	-2.33, -0.89	**< 0.0001**
Global Overcoverage	mHHS			-7.21	-13.76, -0.67	**0.031**
	NAHS			-8.18	-15.01, -1.35	**0.019**
Lateral Overcoverage	mHHS			-0.171	-5.71, 5.38	0.953
	NAHS			1.77	-4.02, 7.56	0.546
Age at surgery	mHHS			-0.14	-0.36, 0.08	0.2
	NAHS			-0.15	-0.38, 0.08	0.21
Postoperative LCEA > 40°	mHHS			0.33	-0.22, 0.88	0.24
	NAHS			0.24	-0.34, 0.81	0.418
Preoperative MHHS Score	mHHS			-0.24	-0.71, 0.21	0.284
Preoperative NAHS Score	NAHS			0.37	-0.11, 0.85	0.127