

Borderline Hip Dysplasia is Not Associated with Significant Differences in Hip Survivorship or Patient-Reported Outcomes Following Primary Hip Arthroscopy for Femoroacetabular Impingement Syndrome: A Propensity-Matched Cohort Study with Minimum 10-Year Follow-Up

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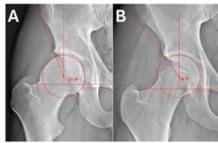
INTRODUCTION: Hip arthroscopy (HA) has demonstrated favorable short- and mid-term outcomes for femoroacetabular impingement syndrome (FAIS) in patients with borderline hip dysplasia (BHD). However, long-term outcomes in patients with FAIS in the presence BHD treated by hip arthroscopy remain understudied. The purpose of this study was to evaluate hip survivorship and patient-reported outcomes (PROs) in patients with FAIS and BHD compared to those without BHD at a minimum 10-year follow-up.

METHODS: A retrospective matched-cohort study was conducted on patients undergoing primary hip arthroscopy for FAIS by a single surgeon (2012–2024). BHD was defined as a lateral center-edge angle (LCEA) of 20°-25°. Patients with BHD were matched 1:2 to controls without BHD based on age, sex, BMI, and preoperative modified Harris Hip Score (mHHS). Radiographic parameters (e.g., alpha angle, LCEA) were assessed preoperatively and postoperatively. PROs, including mHHS and Non-Arthritic Hip Score (NAHS), and hip survivorship (revision arthroscopy, conversion to THA) were compared

RESULTS: The study included 23 patients with BHD (mean age 33.6 years, 69.6% female) and 46 controls (mean age 32.7 years, 65.2% female). Both groups showed significant improvements in mHHS and NAHS at 10 years (all $p < .001$), with no differences in postoperative scores or MCID achievement (BHD 91.3% vs control 97.5%, $p > .05$). There were no conversions to THA in the BHD group and 2 in the controls (4.3%, $p = .189$). Revision arthroscopy rates were 0% in the BHD group and 8.7% in controls ($p = .549$). BHD patients exhibited significantly greater reductions in alpha angles on 45° Dunn views (-13.0° vs -1.9° , $p = .01$).

DISCUSSION AND CONCLUSION: At a minimum 10-year follow-up, patients with BHD that underwent hip arthroscopy for FAIS achieved comparable PROs and hip survivorship to those without BHD. These findings support hip arthroscopy as a durable and effective treatment for FAIS in this population.

Figure 1. Radiographs of Hips With and Without Borderline Hip Dysplasia



A: Hip with BHD, demonstrating an LCEA of 21.6°
B: Hip with BHD, demonstrating an LCEA of 36.9°

BHD: Borderline Hip Dysplasia, LCEA: lateral center edge angle

Table 1. Patient-Reported Outcomes at 10-Year Follow-Up

Variable*	BHD (n = 23)	Control (n = 46) [†]	P-Value [‡]
mHHS			
At baseline	51.365 ± 9.8	52.8 ± 12.6	.623
At 10y follow-up	88.3 ± 17.0	91.5 ± 11.4	.539
Change in score [‡]	36.9 ± 19.4	38.8 ± 15.6	.809
	P=0.001	P=0.001	
Achieved MCID [§]	21 (91.3%)	39 (97.5%)	.55
NAHS			
At baseline	48.2 ± 12.4	49.3 ± 12.4	.937
At 10y follow-up	85.6 ± 19.8	89.8 ± 11.1	.813
Change in score [‡]	39.5 ± 24.2	40.5 ± 24.2	.904
	P=0.001	P=0.001	
Achieved MCID [§]	21 (91.3%)	39 (97.5%)	.55

*Continuous Variables are reported as mean ± standard deviation; categorical variables are reported as n (%).

[†]Means were compared using the Mann-Whitney U test; counts were compared using the Fisher exact test.

[‡]Patients converted to THA or requiring revision surgery were excluded from PRO analysis, leaving 40 controls instead of 46.

[§]Preoperative to Postoperative change in score was evaluated using the Wilcoxon signed-rank test.

§ MCID achievement was defined as a Δ mHHS ≥ 32.12 or a NAHS ≥ 17 .

Table 2. Hip Survivorship at 10-Year Follow-Up

Variable*	BHD (n = 23)	Control (n = 46)	P-Value [‡]
Hip Survivorship			
Revision Arthroscopy	0	4 (8.7%)	.549
Time to Revision, mo		Range 3.6 – 49.5	
Conversion to THA	0 (0%)	2 (4.3%)	.189
Time to THA, mo		Range 126.8 – 110.0	

*Continuous Variables are reported as mean ± standard deviation; categorical variables are reported as n (%).

[†]Means were compared using the Mann-Whitney U test; counts were compared using the Fisher exact test.

Figure 2. Radiographs of Hips with Varying Retroversion



A: Hip with BHD, No Retroversion
B: Hip with BHD, Focal Retroversion (Crossover Sign Only)
C: Hip with BHD, Global Retroversion
BHD: Borderline Hip Dysplasia