Long-Term Outcomes and Survivorship of Patients Undergoing Primary Hip Arthroscopy for Femoroacetabular Impingement Syndrome with Interportal Capsulotomy Without Capsular Repair: A 10-Year Follow-Up Study

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INTRODUCTION:
Hip arthroscopy can be performed to treat femoroacetabular impingement syndrome (FAIS) and improve pain and function. While capsular repair is increasingly performed to restore hip joint stability, its importance was not as well established 10-15 years ago. Several recent clinical studies have demonstrated superior outcomes in patients who undergo hip arthroscopy with capsular repair; however, there is limited evidence regarding long-term outcomes in patients treated without capsular repair prior to its widespread adoption. The goal of this study was to evaluate 10-year survivorship, patient-reported outcomes (PROs), and clinically significant improvements in patients undergoing hip arthroscopy without capsular repair, while also assessing the influence of patient factors such as age, sex, and body mass index (BMI).
METHODS:
We conducted a retrospective review of a prospectively collected database of patients who underwent hip arthroscopy for FAIS with minimum 10-year follow-up between 2010 and 2013. Patients with hip dysplasia (lateral center-edge angle <25°), Tönnis osteoarthritis grade >1, or previous ipsilateral hip surgery were excluded. All patients underwent horizontal interportal capsulotomy without capsular repair. Patient reported outcomes (PROs) including modified Harris Hip Score (mHHS), Nonarthritic Hip Score (NAHS), and the minimal clinically important difference (MCID) were analyzed. Survivorship, defined as undergoing revision arthroscopy or conversion to total hip arthroplasty, was also determined. Subgroup analyses were conducted to evaluate the impact of age, sex, BMI, Tönnis grade, and Outerbridge classification on long-term outcomes.
RESULTS:
A total of 150 patients were included, with a mean follow-up of 11.67 ± 1.06 years. The mean patient age was 38.28 ± 12.12 years, and the cohort was 62.7% (94/150) female. Survivorship at 10 years was 90.67%, with 7 patients (4.67%) converting to total hip arthroplasty and 7 patients (4.67%) undergoing revision arthroscopy. Significant improvements were observed in the mHHS from baseline (51.96 ± 11.71) to 10-year follow-up (87.94 ± 16.66) ($p < 0.0001$) as well as in the NAHS (49.45 ± 11.35 to 86.18 ± 17.99) ($p < 0.0001$). High rates of MCID achievement were observed for mHHS (89.3%) and NAHS (91.9%). Subgroup analyses revealed that higher BMI ($p < 0.0001$) and female sex ($p < 0.05$) were associated with worse PROs. Tönnis grade 1 osteoarthritis ($p = 0.003$) and preoperative NAHS ($p = 0.034$) were significantly associated with increased failure rates.
DISCUSSION AND CONCLUSION:
Patients undergoing primary hip arthroscopy with a horizontal interportal capsulotomy and without capsular repair experienced high survivorship and significant long-term improvements in PROs at 10 years. These findings suggest that when a minimally disruptive capsulotomy technique is used, routine capsular repair may not be universally necessary to achieve favorable long-term outcomes. While factors such as BMI and sex significantly influenced long-term outcomes, even patients with less favorable characteristics achieved meaningful improvements over the follow-up period. This study underscores the importance of considering both patient-specific risk factors and capsulotomy type when determining the need for capsular repair in hip arthroscopy.

Table 1. Total Cohort Patient Demographics and Outcomes

Patient Cohort (n)		150
Age (years)		38.28 ± 12.12
BMI (kg/m²)		24.79 ± 4.02
Sex	Female	94 (62.67%)
	Male	56 (37.33%)
Laterality	Left	64 (42.67%)
	Right	86 (57.33%)
Follow up (years)		11.67 ± 1.06
Baseline	mHHS	51.96 ± 11.71
	NAHS	49.45 ± 11.35
10 Year	mHHS	87.94 ± 16.66
	NAHS	86.18 ± 17.99
Achieved 10-Year mHHS MCID		134 (89.33%)
Achieved 10-Year NAHS MCID		136 (91.89%)
Failure (THA / Revision)		14 (9.33%)
Time to Failure (Years)		5.33 ± 6.26
Conversion to THA		7 (4.67%)
Time to THA (Years)		8.8 ± 3.08
Revision Rate		7 (4.67%)
Time to Revision (Years)		1.97 ± 1.55

Table 2. Analysis of Failures and Non-Failure cohorts based on patient demographics and clinical factors

		Failures (n = 14)	Non-failures (n= 136)	P-Value
Age (Years)		39.64 ± 10.02	35.14 ± 12.34	0.061
BMI (kg/m²)		25.84 ± 4.41	24.66 ± 3.97	0.291
Sex	Female	8 (57.14%)	86 (63.24%)	0.775
	Male	6 (42.86%)	50 (36.76%)	
Laterality	Left	4 (28.57%)	60 (44.12%)	0.369
	Right	10 (71.43%)	76 (55.88%)	
Follow up (Years)		12.15 ± 0.83	11.62 ± 1.07	**0.075**
Tönnis Grade	0	3 (3.26%)	89 (96.74%)	**0.0016**
	1	11 (18.97%)	47 (81.03%)	
Outerbridge Classification	0-2	10 (7.87%)	117 (92.13%)	**0.035**
	3-4	4 (28.57%)	10 (71.43%)	

Table 3. Pre- and Post-operative Radiographic Characteristics

Ischial Spine Sign		93 (62%)
Crossover Sign		101 (67.33%)
LCEA (degrees)	Preoperative	34.12 ± 5.89
	Postoperative	32.9 ± 5.86
Alpha Angle (degrees)	AP View (Preoperative)	69.02 ± 16.33
	AP View (Postoperative)	64.78 ± 13.64
	45 Dunn (Preoperative)	57.78 ± 14.54
	45 Dunn (Postoperative)	54.76 ± 10.62
	90 Dunn (Preoperative)	53.37 ± 17.28
	90 Dunn (Postoperative)	49.63 ± 11.28
Head-Neck Angle (degrees)	Preoperative	129.24 ± 12.03
	Postoperative	131.28 ± 4.78
Outerbridge Grade	0-2	127 (90.07%)
	3-4	14 (9.93%)
Tönnis Grade	0	92 (61.33%)
	1	58 (38.67%)

Table 4. Multivariate Regression Analysis of Factors Influencing 10-Year Postoperative mHHS and NAHS Outcomes

			Mean ± SD	Beta (β) Coefficient	Confidence Interval (95%)	P Value
Sex	mHHS	Male	91.55 ± 14.45	-3.27	-6.30, -0.23	**0.034**
		Female	85.91 ± 17.61			
	NAHS	Male	90.27 ± 14.85	-3.4	-6.66, -0.23	**0.036**
		Female	83.75 ± 19.28			
Tönnis grade	mHHS	0	89.12 ± 15.91	-1.12	-3.78, 5.53	0.719
		1	86.07 ± 17.78			
	NAHS	0	87.45 ± 17.58	0.05	-7.01, 7.08	0.994
		1	84.18 ± 19.05			
Outerbridge Grade	mHHS	0-2	88.17 ± 16.56	-1.79	-6.43, 2.85	0.446
		3-4	89.08 ± 13.28			
	NAHS	0-2	86.56 ± 18.06	-1.71	-6.63, 3.28	0.492
		3-4	86.61 ± 14.47			
LCEA	mHHS			-0.26	-0.73, 0.22	0.288
	NAHS			-0.26	-0.76, 0.25	0.318
BMI	mHHS			-1.29	-1.99, -0.60	**0.0004**
	NAHS			-1.45	-2.20, -0.91	**< 0.0001**
Age at surgery	mHHS			-0.03	-0.31, 0.24	0.815
	NAHS			-0.09	-0.39, 0.20	0.540
Preoperative MHHS Score	mHHS			-0.02	-0.51, 0.44	0.928
	NAHS			0.11	-0.40, 0.63	0.673
Preoperative NAHS Score	mHHS			0.37	-0.33, 0.67	0.506
	NAHS			0.07	-0.45, 0.68	0.701

Table 5: Logistic Regression Analysis of Factors Influencing 10-Year Failure (THA / Revision)

	Beta (β) Coefficient	Confidence Interval (95%)	P Value
Sex	-0.20	-0.99, 0.47	0.482
Tönnis Grade	2.78	1.07, 4.83	**0.003**
Outerbridge Grade	-0.31	-1.10, 0.51	0.438
LCEA	0.06	-0.07, 0.19	0.36
BMI	0.10	-0.07, 0.28	0.240
Age at surgery	-0.06	-0.14, 0.01	0.077
Preoperative mHHS Score	0.06	-0.07, 0.18	0.238
Preoperative NAHS Score	-0.16	-0.31, -0.01	**0.034**