Concomitant Lumbosacral Spine Pathology is Not a Contraindication for Arthroscopic Hip Preservation Surgery: A Matched Control Study Comparing Mid-Term Outcomes

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INTRODUCTION: The overlapping biomechanical relationship between the lumbosacral spine and pelvis poses a unique challenge for patients with concomitant hip and spine pathologies, as the tandem of compensatory stresses from either structure may exacerbate symptoms in the other and confound treatment outcomes. Specifically, in the setting of lumbosacral spine pathology, the loss of spinopelvic mobility may exacerbate hip-specific symptoms in patients with femoroacetabular impingement (FAI), as activities requiring high degrees of hip flexion inherently perpetuate mechanical injury to the chondrolabral complex. However, the relevance of concomitant lumbosacral pathology in tempering patient expectations and optimizing outcomes for hip arthroscopy has yet to be established. Thus, the purpose of this study was to assess the influence of concomitant lumbosacral spine pathology on patient-reported outcome metrics (PROMs) and rates of achieving clinically meaningful outcomes (i.e., minimal clinically important difference [MCID] and patient-acceptable symptom states [PASS]) following hip arthroscopy for the treatment of symptomatic labral tears in patients with FAI.

METHODS:

A retrospective review of a prospectively collected, single-surgeon database was performed to identify patients ≥18 years of age who underwent primary hip arthroscopy for the treatment of labral tears secondary to FAI with a minimum of 2 years of follow up. Those with a history of spine or ipsilateral hip surgery were excluded. Patients were then stratified into the hip-spine (HS) or matched-control (MC) cohort based on the presence or absence of lumbosacral spine pathology, respectively. Inclusion within the HS cohort required subjective confirmation of low back pain on preoperative surveys and objective radiographic evidence of lumbosacral spine pathology. Cohorts were coarsened exact matched on age, sex, and body mass index. PROMs and frequencies of achieving clinically meaningful threshold values, including MCID and PASS, were then compared between groups. Outcomes included modified Hip Harris Score (mHHS), Hip Outcome Score-Activities of Daily Living (HOS-ADL), Hip Outcome Score-Sports Subscale (HOS-SS), International Hip Outcome Tool-33 (iHOT-33), Non-Arthritic Hip Score (NAHS), visual analogue scale (VAS) pain, rates of revision arthroscopy, and conversion to total hip arthroplasty (THA).

RESULTS: In total, 70 patients with lumbosacral spine pathology were matched to 87 control patients without spine pathology (**Table 1**). Preoperatively, the HS cohort displayed significantly worse scores for all but one outcome. Short-term follow up at 3-, 6-, 12-, and 24-months displayed similar trends, with the HS cohort demonstrating significantly worse scores for nearly all collected outcomes. However, HS and MC patients exhibited statistically similar magnitudes of improvement in all outcomes at every timepoint ($P_{improvement} > .05$). Thus, differences in PROM scores were largely mitigated by midterm follow up, as no significant differences were observed at 3- and 5-year follow ups ($P_{mean} > .05$ for all) **(Figure 1)**. Rates of achieving clinically meaningful outcomes also followed similar trends, as the HS cohort achieved PASS thresholds at significantly lower frequencies for nearly all PROMS at 12- and 24- months, but displayed statistically similar frequencies of PASS achievement at 5-year follow-up for all PROMs ($P > .05$ for all) **(Table 2)**. Additionally, similar frequencies of MCID achievement were observed across nearly all PROMs at 12-month, 24-month, and 5-year follow ups. No significant differences in the rates of revision or conversion to total hip arthroplasty were identified between cohorts ($P > .05$ for both).

DISCUSSION AND CONCLUSION:

Following hip arthroscopy for the treatment of acetabular labral tears secondary to FAI, patients with lumbosacral pathology and no prior history of spine surgery experience statistically similar clinical benefit and rates of improvement at 2-year follow up relative to matched controls without lumbosacral pathology. Moreover, although concomitant lumbosacral pathology negatively impacts short-term outcomes, our preliminary analysis of outcomes at 3- and 5-years reveals that it may not impact mid-term outcomes. Thus, longer follow up may be necessary to define the true magnitude of improvement that patients with concomitant lumbosacral pathology may achieve. Overall, our data provide further evidence that coexisting hip and spine disorders are not a contraindication for arthroscopic hip preservation surgery. These findings have implications for the shared decision-making process and may aid in tempering patients' postoperative expectations by providing a realistic timeline for recovery.

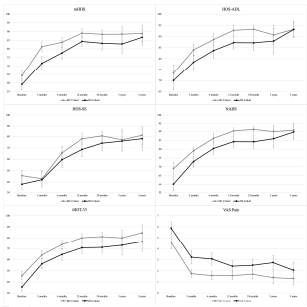

Figure 1
Patient-reported outcomes and 95% confidence intervals over time for patients with and without hip-spine syndrome. ***Abbreviations:*** *HS, hip-spine; MC, matched control; mHHS, modified Harris Hip Score; HOS-ADL, Hip Outcome Score-Activities of Daily Living; HOS-SS, Hip Outcome Score-Sports Subscale; NAHS, Non-Arthritic Hip Score; iHOT-33, International Hip Outcome Tool-33; VAS, visual analog scale.*

TABLE I.
Patient Demographic Characteristics by Cohort

	HS Cohort (n = 70)	MC Cohort (n = 87)	*P* Value
Age (years), mean (95% CI)	39.4 (37.1-41.7)	35.8 (33.2-38.4)	0.051
Sex, *n* (%)			0.391
Male	33 (47.1%)	47 (54.0%)	
Female	37 (52.9%)	40 (46.0%)	
BMI (kg/m²), mean (95% CI)	26.1 (25.2-27.0)	25.1 (24.2-25.9)	0.116
Laterality, *n* (%)			0.541
Left	34 (48.6%)	38 (43.7%)	
Right	36 (51.4%)	49 (56.3%)	
α angle, mean (95% CI)	52.2 (48.9-55.5)	55.2 (51.7-58.6)	0.235
LCEa, mean (95% CI)	37.0 (35.6-38.5)	37.2 (36.1-38.2)	0.894
Tönnis Angle, mean (95% CI)	6.7 (5.6-7.9)	5.9 (4.7-7.1)	0.338
Tönnis Grade, *n* (%)			0.915
0	36 (51.4%)	44 (50.6%)	
1	34 (48.6%)	43 (49.4%)	
Type of FAI, *n* (%)			0.342
Pincer deformity	41 (58.6%)	42 (48.3%)	
CAM deformity	1 (1.4%)	4 (5.6%)	
CAM and Pincer	28 (40.0%)	41 (47.1%)	
Lumbar Spine Pathology			
Degenerative Disk Disease/Spondylosis	32 (45.7%)	-	
Degenerative Scoliosis	8 (11.4%)	-	
Lumbar Disc Herniation	12 (17.1%)	-	
Foraminal Stenosis	12 (17.1%)	-	
Spondylolysis	2 (2.8%)	-	
Spondylolisthesis	4 (5.7%)	-	

Abbreviations*: HS, hip-spine; MC, matched control; CI, confidence interval; BMI, body mass index; LCEa, lateral center edge angle; FAI, femoroacetabular impingement.* †A significant difference between groups.

TABLE II
Frequency of Patients Achieving MCID and PASS Thresholds

	MCID				PASS			
	Threshold	HS Cohort % Achieved	MC Cohort % Achieved	*P*	Threshold	HS Cohort % Achieved	MC Cohort % Achieved	*P*
12 Month								
n		***65***	***76***			***65***	***76***	
mHHS	Δ >6.9	87.7%	81.3%	0.303	>84.8	44.6%	61.3%	0.048†
HOS-ADL	Δ >8.8	67.7%	68.4%	0.926	>89.7	49.2%	81.6%	0.000†
HOS-SS	Δ >13.9	78.5%	73.3%	0.480	>72.2	47.7%	68.0%	0.015†
NAHS	Δ >9.1	83.1%	67.1%	0.030†	>81.9	64.6%	86.8%	0.002†
iHOT-33	Δ >15.1	75.0%	75.0%	1.000	>69.1	54.7%	80.3%	0.001†
24 Month								
n		***66***	***77***			***66***	***77***	
mHHS	Δ >9.2	84.9%	83.1%	0.779	>83.3	59.1%	75.3%	0.038†
HOS-ADL	Δ >9.7	62.1%	68.8%	0.399	>88.2	65.2%	81.8%	0.023†
HOS-SS	Δ >14.3	78.8%	77.9%	0.900	>76.4	59.1%	68.8%	0.225
NAHS	Δ >8.3	83.3%	80.5%	0.664	>85.6	60.6%	80.5%	0.009†
iHOT-33	Δ >13.9	80.3%	84.4%	0.519	>72.2	54.6%	72.7%	0.024†
5 Years								
n		***21***	***31***			***21***	***31***	
mHHS	Δ >11.4	81.0%	80.7%	0.978	>83.6	71.4%	77.4%	0.624
HOS-ADL	Δ >10.2	71.4%	58.1%	0.326	>92.2	71.4%	71.0%	0.971
HOS-SS	Δ >15.2	85.7%	80.7%	0.635	>80.9	61.9%	64.5%	0.848
NAHS	Δ >12.6	81.0%	71.0%	0.415	>81.9	81.0%	83.9%	0.785
iHOT-33	Δ >15.1	85.7%	77.4%	0.456	>74.3	52.4%	74.2%	0.105

Abbreviations: *HS, hip-spine; MC, matched control; MCID, minimal clinically important difference; PASS, patient acceptable symptom state; mHHS, modified Harris Hip Score; HOS-ADL, Hip Outcome Score-Activities of Daily Living; HOS-SS, Hip Outcome Score-Sports Subscale; NAHS, Non-Arthritic Hip Score; iHOT-33, International Hip Outcome Tool-33.* †*A significant difference between groups.*