Acetabular Liner Design is Not Associated with Iliopsoas Tendonitis Following Total Hip Arthroplasty

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INTRODUCTION: Prominence of the acetabular component beyond the anterior wall has been shown to be associated with iliopsoas tendon irritation and pain following total hip arthroplasty (THA). As offset liners become more commonly used, concerns have arisen regarding their potential to irritate the iliopsoas tendon in a similar mechanism by extending beyond native acetabular boundaries. This study aimed to evaluate whether use of offset liners is associated with higher rates of symptomatic iliopsoas tendonitis.

METHODS: Patients diagnosed with iliopsoas tendonitis following primary THA between January 2010 and December 2022 at a single institution were retrospectively reviewed. Patients treated with constrained liners were excluded. Data collected included demographics, surgical approach, head size, liner design, pre- and post-op hip offset, and acetabular component anteversion and inclination. Cases were 3:1 matched to primary THA patients who did not develop iliopsoas tendonitis by age, sex, body mass index (BMI), medical comorbidity burden, and liner design. Multivariate logistic regression was performed to control for potential confounders.

RESULTS: Sixty-nine patients with iliopsoas tendonitis were matched to 207 controls. Groups did not differ with respect to surgical approach used, femoral head size, acetabular component anteversion, and change in hip offset. Patients who developed iliopsoas tendonitis had higher acetabular component inclination (44.6±6.9 vs 40.6±6.0 degrees, p<0.001) and a lower rate of collared femoral stem use (13% vs 30%, p=0.007). After controlling for potential confounding variables, liner design was not associated with development of iliopsoas tendonitis.

DISCUSSION AND CONCLUSION: Our analysis found no association between liner design and development of iliopsoas tendonitis. These data suggest that current methods of offset acetabular liner use have minimal effect on risk of developing iliopsoas tendonitis. Surgeons should remain cognizant of the relationship of the position of the acetabular component with respect to the anterior wall, as inadvertent anterior prominence may promote iliopsoas irritation.

Table 1. Patient Demographics

Mean ± SD, unless otherwise specified	Iliopsoas Tendonitis Cohort	Controls	P-value
Total n=276	n=69	n=207	
Age	56.51 ± 9.65	57.63 ± 9.40	0.284
Male (n, %)	28 (41%)	96 (46%)	0.485
BMI	30.85 ± 5.91	29.74 ± 5.86	0.160
CCI	2.99 ± 1.65	3.12 ± 1.52	0.404
Liner Design			
Neutral	53 (77%)	160 (77%)	1.000
Lateralized	5 (7%)	31 (15%)	0.149
Lipped	5 (7%)	7 (3%)	0.307
Dual Mobility	6 (9%)	9 (4%)	0.283
Smoking Status			0.143
Never	54 (78%)	151 (73%)	
Former	14 (20%)	38 (18%)	
Current	1 (1%)	17 (8%)	

Iliopsoas tendonitis cases matched 3:1 based on age, sex, BMI, CCI, and liner design.

Table 2. Univariate Analysis for Predictors of Iliopsoas Tendonitis.

Mean ± SD, unless otherwise specified	Iliopsoas Tendonitis Cohort	Controls	P-value
n	69	207	
Acetabular Anteversion	24.54 ± 8.79	26.13 ± 7.63	0.202
Acetabular Inclination	44.6 ± 6.9	40.6 ± 6.0	<0.001
Change in Hip Offset	2.42 ± 5.97	3.93 ± 7.23	0.108
Collared Stem	9 (13%)	63 (30%)	0.007
Surgical Approach			
Posterior	61 (88%)	170 (82%)	0.301
Anterior	2 (3%)	5 (2%)	1.000
Anterior-Lateral	6 (9%)	28 (14%)	0.398
Lateral	0	4 (2%)	0.561
Femoral Head Size			
Dual-Mobility Head	6 (9%)	9 (4%)	0.217
28mm	2 (3%)	1 (1%)	0.155
32mm	8 (12%)	22 (11%)	0.825
36mm	31 (45%)	110 (53%)	0.267
40mm	19 (28%)	56 (27%)	1.000
42mm	1 (1%)	0	0.250
44mm	2 (3%)	9 (4%)	0.657

Table 3. Multivariate Analysis of Independent Predictors of Iliopsoas Tendonitis Adjusted for Age, Sex, BMI, and CCI.

Variable	Coefficient (β)	Standard Error	Odds Ratio (95% CI)	P-value
Acetabular Inclination	0.09	0.03	1.10 (1.05 – 1.15)	<0.001
			Odds Ratio (95% Confidence Interval)	
Collared Stem			0.27 (0.12 – 0.59)	0.001
Liner Design				
Lateralized			0.39 (0.14 – 1.09)	0.081
Lipped			3.55 (0.97 – 13.02)	0.056
Dual Mobility			1.59 (0.51 – 4.97)	0.424

Neutral liners were used as the reference group during multivariate analysis.