

# How does Surgical Approach Affect Characteristics of Dislocation after Total Hip Arthroplasty?

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## INTRODUCTION:

Due to the differences in soft tissue structures in total hip arthroplasty (THA) performed via the posterior approach (PA), direct anterior approach (DAA), and direct lateral approach (DLA), concerns have been voiced regarding how surgical approach impacts the risk of dislocation after THA. Therefore, this study sought to examine how surgical approach impacts the incidence, direction, and timing of dislocations following THA.

## METHODS:

We conducted a retrospective review of 9,495 primary THAs performed at our hospital from 2011 to 2020 and identified 120 patients with clinical and radiographic documentation of prosthetic hip dislocation. Patients were stratified into cohorts based on the surgical approach used during their primary THA. Baseline demographics, as well as the number, direction, date of documented dislocations or subsequent revisions, and acetabular cup anteversion and inclination from index THA were collected.

## RESULTS:

Among the overall cohort of 9,495 patients there was no difference in dislocation rate between the PA, DAA, and DLA cohorts (1.4% vs. 1.0% vs. 1.1%, p=0.362). When comparing the direction of dislocation between primary approach groups, there was no difference in rate of posterior direction (p=0.159) or multidirectional (p=0.508) dislocations. Rate of anterior direction hip dislocations among those who dislocated varied among groups (p=0.044) and was highest in the DLA cohort (50.0%), followed by the DAA cohort (38.2%), with the PA having the lowest rate of anterior direction dislocations (19.2%). Of patients who dislocated, the acetabular anteversion during primary THA was highest in the PA cohort compared to the DAA and DLA (21.5 vs. 19.2 vs. 11.7 degrees, p=0.049), though there was no difference in acetabular inclination. There were no statistically significant differences in dislocation timing or revision rate among cohorts.

## DISCUSSION AND CONCLUSION:

Our results suggest that with modern primary THA, there is no significant difference in rates of prosthetic hip dislocation, regardless of surgical approach. Surgical approach does not significantly impact dislocation incidence or timing, and patients undergoing all three approach groups have no difference in posterior direction dislocations or multidirectional instability. Overall, our data suggests that surgical approach impacts rate and characteristics of dislocations to a lesser degree than previous studies have suggested.

**Table 1 - Baseline Characteristics**

Characteristic	Posterior Approach (n=646)	Anterior Approach (n=346)	Direct lateral approach (n=603)	p-value
Dislocation incidence	9.1 (1.4%)	2.9 (0.8%)	6.6 (1.1%)	0.02
Age (years)	62.5 (10.2)	63.0 (10.1)	62.5 (10.2)	0.95
Sex				0.52
Male	40 (2.9%)	14 (4.0%)	18 (3.0%)	
Female	110 (16.3%)	32 (9.2%)	48 (8.0%)	
Race				0.08
White	110 (16.3%)	32 (9.2%)	48 (8.0%)	
Black or African American	110 (16.3%)	32 (9.2%)	48 (8.0%)	
Asian	110 (16.3%)	32 (9.2%)	48 (8.0%)	
Other	110 (16.3%)	32 (9.2%)	48 (8.0%)	
Body Mass Index	27.5 (5.5)	27.5 (5.5)	27.5 (5.5)	0.58
Time to Dislocation				0.84
Mean	11.0 (8.0)	11.0 (8.0)	11.0 (8.0)	
Median	11.0 (8.0)	11.0 (8.0)	11.0 (8.0)	
Range	0-100 (20)	0-100 (20)	0-100 (20)	
IQR	0-20 (5)	0-20 (5)	0-20 (5)	
95th Percentile	100 (20)	100 (20)	100 (20)	

**Table 2 - Number & Direction of Dislocations**

Dislocation Type	Posterior Approach (n=646)	Anterior Approach (n=346)	Direct lateral approach (n=603)	p-value
Dislocations per patient	0.015 (0.002)	0.008 (0.001)	0.010 (0.001)	0.58
Direction				0.16
Anterior	12 (1.9%)	11 (3.2%)	30 (5.0%)	
Posterior	33 (5.1%)	10 (2.9%)	15 (2.5%)	
Multidirectional	15 (2.3%)	10 (2.9%)	10 (1.7%)	
Indeterminate	10 (1.5%)	10 (2.9%)	10 (1.7%)	

**Table 3 - Dislocation Timing by Approach**

Dislocation Timing	Posterior Approach (n=646)	Anterior Approach (n=346)	Direct lateral approach (n=603)	p-value
Time to Dislocation	11.0 (8.0)	11.0 (8.0)	11.0 (8.0)	0.50
Time to Dislocation < 1 Year	40 (2.9%)	14 (4.0%)	18 (3.0%)	
Time to Dislocation 1-2 Years	110 (16.3%)	32 (9.2%)	48 (8.0%)	
Time to Dislocation > 2 Years	110 (16.3%)	32 (9.2%)	48 (8.0%)	

**Table 4 - Acetabular Cup Placement in Primary THA Patients with Dislocation**

Parameter	Posterior Approach (n=646)	Anterior Approach (n=346)	Direct lateral approach (n=603)	p-value
Acetabular Anteversion (degrees)	21.5 (5.0)	19.2 (4.5)	11.7 (3.5)	0.049
Acetabular Inclination (degrees)	42.3 (3.5)	42.3 (3.5)	42.3 (3.5)	0.15

\*Only Mean values; American Society of Anesthesiologists

\*Incidence values of 1000 hips and 4000 hips; \*Incidence values of 1000 hips

\*Incidence values of 1000 hips and 4000 hips; \*Incidence values of 1000 hips