Outcomes of Total Hip Arthroplasty following Acetabular Fracture: Is there a Difference between Total Hip Arthroplasty in the Acute versus Delayed Setting?

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INTRODUCTION:
Surgical management of acetabular fractures in older patients remains controversial with total hip arthroplasty (THA) often performed after failed open reduction internal fixation (ORIF). There is an increased interest in performing acute THA for geriatric acetabular fractures with high likelihood of subsequent THA. There is a paucity in the literature regarding outcomes of acute THA following acetabular fractures. The purpose of this study was to compare outcomes of acute versus delayed THA for acetabular fractures.

METHODS: A large, national administrative claims database containing diagnostic, procedural, and demographic records from over 157 million patients was analyzed. We identified patients undergoing primary THA who were continuously enrolled in the database for at least 2 years. Patients with an initial diagnostic code for acetabular fracture occurring within 7 days before the THA were classified as acute THA (aTHA). Patients with an initial acetabular fracture diagnostic code occurring at least 6 months before THA were classified as delayed THA (dTHA). The control group was patients undergoing THA without history of acetabular fracture. There were 426,734 patients in the control primary THAs, 235 aTHAs and 1,255 dTHAs.

RESULTS: Patients with aTHA had higher rates of revision (9.8% vs. 5.6%, p = 0.02), dislocations (8.9% vs. 6.4%, p = 0.20), and periprosthetic fracture (5.1% vs. 2.3%, p = 0.03) compared to dTHA. After adjusting for age, sex, region, and comorbidities, receiving an aTHA increased the odds of revision (OR = 3.65 [95% CI: 2.30-5.49]), dislocation (OR = 4.09 [95% CI: 2.53-6.27]), and periprosthetic fracture (OR = 4.29 [95% CI: 2.26-7.36]) compared to primary THA. Receiving a dTHA significantly increased the odds of revision (adjusted OR = 1.80 [95% CI: 1.40-2.27]), dislocation (adjusted OR = 2.50 [95% CI: 1.97-3.13]), and periprosthetic fracture (adjusted OR = 1.99 [95% CI: 1.34-2.83]) compared to primary THA.

DISCUSSION AND CONCLUSION: Acetabular fractures are complex injuries with high rates of failure and conversion to THA. In the current study, patients undergoing acute THA in the treatment of an acetabular fracture have significantly increased rates of revision, periprosthetic fracture, and dislocation compared to delayed THA and primary THA.

Variable	Cohort			p-value (Acute vs. THA only, Chronic vs. THA only)
	THA only (n=426,734)	Acute Acetabular Fracture (n=235)	Chronic Acetabular Fracture (n=1,255)	
Age, n (%)				0.004/ <0.001
<50 years	31,404 (7.4)	17 (7.2)	208 (16.6)	
50-59 years	90,625 (21.2)	40 (17.0)	250 (19.9)	
60-69 years	143,962 (33.7)	63 (26.8)	340 (27.1)	
≥70 years	160,743 (37.7)	115 (48.9)	457 (36.4)	
Sex, n (%)				<0.001/ 0.04
Female	241,382 (56.6)	165 (70.2)	674 (53.7)	
Male	185,352 (43.4)	70 (29.8)	581 (46.3)	
Region, n (%)				0.49/0.20
Midwest	128,958 (30.2)	70 (29.8)	365 (29.1)	
Northeast	95,855 (22.5)	45 (19.1)	271 (21.6)	
South	147,258 (34.5)	84 (35.7)	469 (37.4)	
West	54,663 (12.8)	36 (15.3)	150 (12.0)	
Elixhauser comorbidity index, mean (SD)	4.03 (3.09)	4.87 (3.52)	5.90 (3.86)	<0.001/ <0.001

Outcome	Cohort			p-value (Acute vs. THA only, Chronic vs. THA only)	p-value (Acute vs. Chronic)
	THA only	Acute Acetabular Fracture	Chronic Acetabular Fracture		
Revision, n (%)	11,564 (2.7)	23 (9.8)	70 (5.6)	<0.001/<0.001	0.02
Dislocation, n (%)	8,960 (2.1)	21 (8.9)	80 (6.4)	<0.001/<0.001	0.20
Periprosthetic fracture, n (%)	4,462 (1.0)	12 (5.1)	29 (2.3)	<0.001/<0.001	0.03

Outcome	Adjusted Odds Ratio (95% CI)		p-value*
	Acute Acetabular Fracture (vs. THA only)	Chronic Acetabular Fracture (vs. THA only)	
Revision	3.65 (2.30-5.49)	1.80 (1.40-2.27)	<0.001
Dislocation	4.09 (2.53-6.27)	2.50 (1.97-3.13)	<0.001
Periprosthetic fracture	4.29 (2.26-7.36)	1.99 (1.34-2.83)	<0.001