## Comparative Outcomes Of Conversion To Total Hip Arthroplasty After Failed Osteosynthesis Versus Total Hip Arthroplasty Following Femoral Neck Fractures: A Comprehensive Analysis

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## INTRODUCTION:

Proximal femoral fractures often result in high complication rates, influenced by various patient-related factors and the nature of the fracture. A significant issue is osteosynthesis failure. In such cases, total hip arthroplasty (THA) may be performed as a "salvage" procedure to preserve hip joint mobility and stability. Prior studies have shown that complication rates are higher in conversion THA than in primary elective THA. However, a research gap exists when comparing these two procedures after femoral neck fractures (FNF) to assess if their postoperative outcomes are more alike. The aim of the study was to compare the complication and mortality rates between patients undergoing conversion to THA following failed osteosynthesis and those undergoing THA for FNF.

## METHODS:

A retrospective cohort study conducted between 2015 and 2022 at a tertiary care center included patients with hip fractures treated with canulated screws, Dynamic Hip Screw (DHS), Trochanteric Femoral Nail (TFN), or hybrid THA, with a minimum 1-year follow-up. Data collected included demographics, conversion and treatment specifics, fracture type, reasons for conversion, and postoperative adverse events categorized by the Clavien-Dindo Classification. Our primary outcome was the 90-day complication rate, while secondary outcomes included 90-day unplanned readmissions and mortality.

RESULTS: A total of 106 patients were evaluated (31 conversion THA [cTHA] and 75 nonconversion THA [ncTHA]) with an average follow-up of 36.2 (4-85) months. Screw cut-through and non-union were the most common reasons for conversion group. Mean surgical time differed significantly (94.9 minutes [cTHA] vs. 74.9 minutes [ncTHA], p=0.002). Length-of-stay showed no significant difference (5.48 days [cTHA] vs. 6.9 days [ncTHA], p=0.12). In-hospital (3 [9.7%] cTHA vs. 3 [4%] ncTHA, p=0.35) and 90-day complications (6 [19%] cTHA vs. 9 [12%] ncTHA vs, p=0.36) were similar. Mortality rates at 6 months (3.2% cTHA vs. 4% ncTHA, p=1) and 1 year (3.2% cTHA vs. 6.7% ncTHA vs, p=0.66) were comparable.

## DISCUSSION AND CONCLUSION:

Patients undergoing cTHA, despite longer surgical times, exhibited similar in-hospital stays, 90-day complications, and 6month/1-year mortality rates compared to THA following hip fractures. Nonetheless, careful planning is imperative for cTHA, considering increased demands during surgery, inpatient care, and follow-up. It is crucial to emphasize that the treatment of hip fractures should be guided by the specific fracture pattern rather than the assumption that conversion to THA will necessarily result in higher complication rates. Our findings suggest that biological healing should be given the opportunity to succeed, and if it fails, the outcomes of patients who undergo conversion to THA are comparable to those who undergo THA for FNF in terms of complications. Therefore, it is important to provide thorough preoperative counseling to patients and their families. This counseling should explain the potential outcomes and the rationale for initial fracture management, ensuring they understand that conversion to THA, if needed, does not inherently lead to worse outcomes. Properly informing patients and families can help manage expectations and support informed decision-making regarding their their terms of complexities and families can help manage expectations and support informed decision-making their treatment plan.

fean Age at surgery (range) emale patients § (%) fean BMI kg/m2 (DS) SA Score § (%)	79 (54-93) 62 (54) 24.8 (4.4)	77 (35-94) 24 (74.4)	0.46
emale patients § (%) fean BMI kg/m2 (DS) .SA Score § (%)	62 (54) 24.8 (4.4)	24 (74.4)	0.63
fean BMI kg/m2 (DS) SA Score § (%)	24.8 (4.4)		1
SA Score § (%)		25.4 (3.3)	0.48
			0.17
1	1 (1.3)	2 (6.45)	
п	28 (37.3)	16 (48.4)	
ш	46 (61.3)	13 (41.9)	
IV	-	1 (3.22)	
CI § (%)			0.72
Mild	54 (72)	25 (80.6)	
Moderate	10 (13.3)	3 (9.6)	
Severe	11 (14.6)	3 (9.6)	
fean In-hospital stay (days)	6.9 (2-75)	5.4 (2-20)	0.12
ype of implants used for THA			N/A
Cemented	-	5 (16.1)	
Uncemented	-	16 (51.6)	
Hybrid	75 (100)	14 (45.1)	
DM-cup	-	5 (16.1)	

Table 2. Primary osteosynthesis following FNF and failure causes in cTHA patients Type of primary osteosynthesis cTHA (n =31) CMN 18 (58) 6 (19.3) DHS 7 (22.5) CS Cause of failure Cut Through 9 (29) Avascular Necrosis 9 (29) 3 (9.6) Non-union Mal-union Infection 3 (9.6) Postraumatic osteoarthritis Screw cutout 14 (45.1) Hardware rupture 2 (6.4)

Complications	ne-THA	Clavien-	¢-THA	Clavien-	P- value
	(n=75)	Dindo	(n=31)	Dindo	
Intraoperattive (%) PPFF (A2)	2 (2.6)		2 (6.4)		0.57
In-hospital events (%) Transfusions	3 (4)	2 (minor)	3 (9.7)	2 (minor)	0.35
90- day postoperative (%)	9 (12)		6 (19)		0.36
Superficial infection	3 (4)	3B (major)	1 (3.2)	3B (major)	0.84
Deep infection	1 (1.3)	3A (major)	2 (6.5)	3A (major)	0.14
PPFF (B2)	1 (1.3)	3B (major)	1 (3.2)	3B (major)	0.51
Dislocation	3 (4)	1 (minor)	1 (3.2)	1 (minor)	0.84
TED	1 (1.3)	2 (minor)	1 (3.2)	2 (minor)	0.51

The values are presented as the number of patients, and percentage in parentheses.
CFN: cephalomedullary nail, DHS: Dynamic Hip Serews; DHS + ARS: Dynamic Hip Serews; DHS + ARS: