

Orthopedic Hardware Type Impacts Case Complexity in Conversion Total Hip Arthroplasty Surgery

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INTRODUCTION: Conversion total hip arthroplasty (THA) is the surgical transformation of prior hip fixation to a total joint arthroplasty. Prior implants include percutaneous screw and femoral nail fixation, among others. Femoral nails distort proximal femoral anatomy, compromising the local bone stock, which may weaken the integrity of metaphyseal femoral component fixation¹. Given prior literature defining differences in prior hardware, an investigation is warranted to evaluate what complex differences are influenced by prior hardware. We hypothesize that conversion THA with prior femoral nails is more complex than screws, leading to a more difficult recovery.

METHODS: Following IRB approval, 110 conversion THA cases performed from 2012-2020 by six surgeons were retrospectively analyzed. Through preoperative x-ray review, the group classified 61 patients as having prior screw fixation and 49 patients as having prior nail fixation. A chart review was conducted parsing for demographics, previous surgical history, current vitals, operative details, and postoperative recovery. Statistical comparisons between the groups were conducted with either a student's T-test or Chi-Square test.

RESULTS: Femoral nail patients required 63% longer surgeries ($P < .0001$), sustained increased blood loss ($P < .0001$), and required longer hospital stays postoperatively ($P = .0079$) compared to the screw cohort (Table 1). While insignificant, trochlear plate usage was more common in patients with prior femoral nail fixation ($P = .1205$). All groups were demographically similar.

DISCUSSION: The results support our hypothesis and highlight the complexity of femoral nail conversion compared to screw. The index indication for the use of screws or nails are different, yet they are grouped under the same conversion THA case category. The nail conversion cases are associated with additional difficulty with respect to surgery and recovery. Given the findings that surgical complexity increases dependent on prior hardware, surgeons and patients should anticipate longer operative times and a more intensive recovery process. Further, healthcare providers should carefully evaluate a patient's current health and prior medical history to set realistic recovery expectations.

SIGNIFICANCE/CLINICAL RELEVANCE: Regarding conversion THA, evaluating a patient's prior and current health in anticipation of increased surgical complexity can help establish recovery expectations. Transparent communication is paramount in these cases since surgical complexity can vary based on prior hardware.

REFERENCES:

1. Sakellariou VI, Babis GC. Management bone loss of the proximal femur in revision hip arthroplasty: Update on reconstructive options. *World J Orthop.* 2014;5(5):614-622. Published 2014 Nov 18. doi:10.5312/wjo.v5.i5.614

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IMAGES AND TABLES:

Table 1. Demographics and Surgical Outcomes of Conversion THA Cases by Prior Hardware.

	Screw Fixation n=61	Femoral Nail Fixation n=49	P Value
Age	66.11 ± 14.52	68.61 ± 13.41	.3553
Male:Female Ratio	0.96	0.44	.1336
BMI (kg/m ²)	27.49 ± 7.30	27.64 ± 7.10	.9139
Procedure Time ^a	1.00 ± .33 (n=56)	1.63 ± .64 (n=45)	< .0001
Trochlear Plate Usage	5 (8.20%)	10 (20.41%)	.1205
Estimated Blood Loss	332.42 ± 191.71 (n=60)	560.44 ± 358.94 (n=45)	< .0001
Length of Stay	2.54 ± 1.67	3.63 ± 2.52 (n=48)	.0079
Discharge Home Rate	48 (78.69%)	34 (70.83%)	.6563

^aNormalized to Screw Fixation