



Variations in Peripheral Nerve Block Utilization for Primary versus Revision Total Hip Arthroplasty: An Institutional Analysis of 18,525 Cases

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INTRODUCTION

- Peripheral nerve blocks (PNBs) for THA are associated with lower opioid requirements and improved outcomes
 - Revision THAs often have more soft tissue damage than primary THAs, leading to >3X more opioid consumption, worse pain scores, and persistent opioid use
- We aimed to describe PNB utilization and outcomes for revision THAs*

METHODS

- 17,282 primary and 1,243 revision THA records from January 4th, 2021 to December 31st, 2024, were identified after IRB approval (#2022-2392)
- Primary outcomes: primary anesthesia type, fascial/peripheral nerve block used, medications
- Secondary outcomes: pain scores and opioid use
- Logistic regression and generalized linear mixed models investigated surgeon and anesthesiologist-level differences to explain variations in PNB use

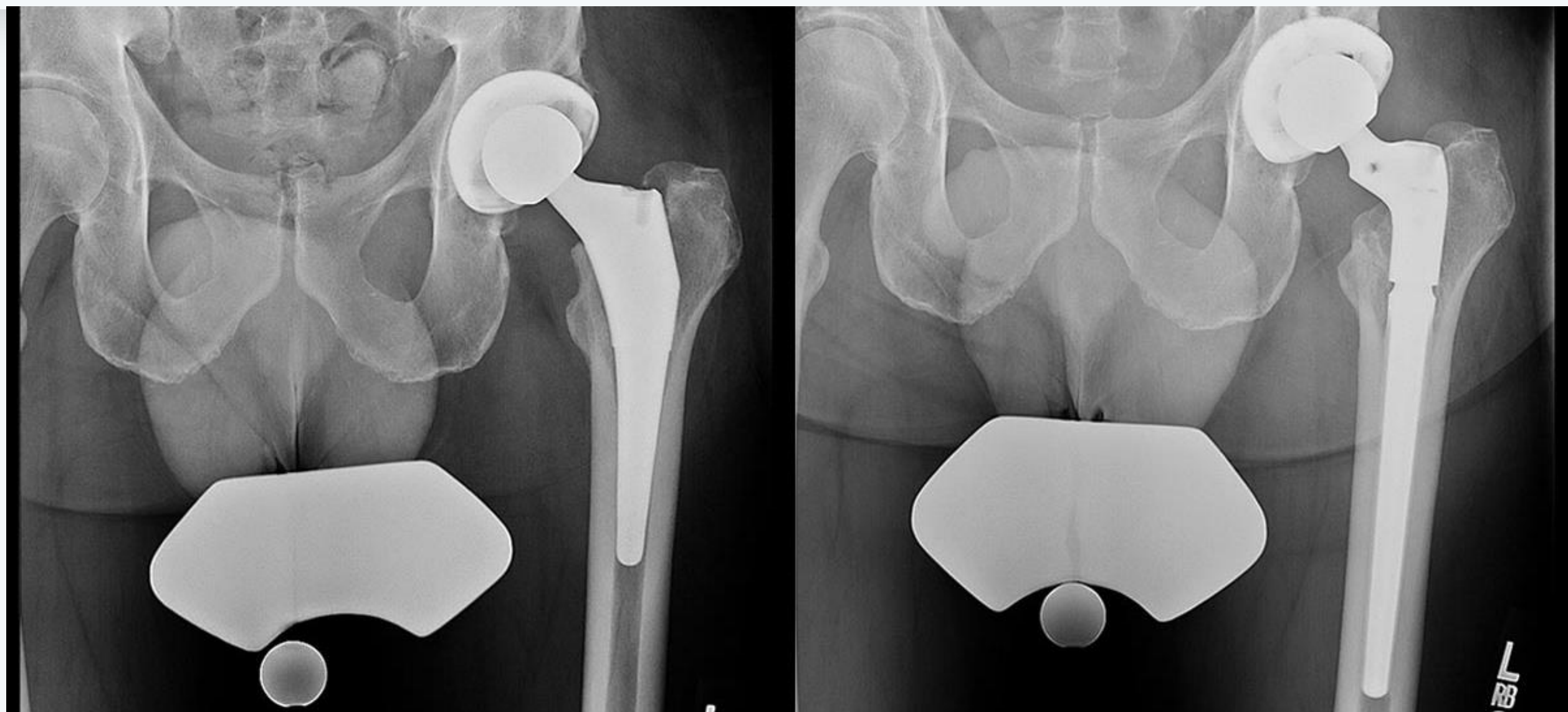


Table 1: Description of block variables by surgery type among hip patients (N=18,525)

Variable	Total	Primary (N=17,282)	Revision (N=1243)	P-Value*
Neuraxial Block				<.0001
Combined spinal epidural	4536 (24.49%)	3799 (21.98%)	737 (59.29%)	
Epidural	377 (2.04%)	333 (1.93%)	44 (3.54%)	
Spinal	12,805 (69.12%)	12,449 (72.03%)	356 (28.64%)	
None	807 (4.36%)	701 (4.06%)	106 (8.53%)	
Neuraxial Medication				<.0001
Bupivacaine	3182 (17.18%)	2526 (14.62%)	656 (52.78%)	
Chloroprocaine	514 (2.77%)	508 (2.94%)	6 (0.48%)	
Lidocaine	210 (1.13%)	190 (1.1%)	20 (1.61%)	
Mepivacaine	15,615 (84.29%)	15,044 (87.05%)	571 (45.94%)	
Peripheral Nerve Block				0.0004
Femoral	6 (0.03%)	2 (0.01%)	4 (0.32%)	
Fascia Iliaca	2339 (12.63%)	2212 (12.8%)	127 (10.22%)	
LFCN	511 (2.76%)	489 (2.83%)	22 (1.77%)	
Lumbar Plexus	217 (1.17%)	199 (1.15%)	18 (1.45%)	
PENG	4133 (22.31%)	3941 (22.8%)	192 (15.45%)	<.0001
Peripheral Nerve Block Medication				
Bupivacaine	4295 (23.18%)	4061 (23.5%)	234 (18.83%)	
Mepivacaine	10 (0.05%)	6 (0.03%)	4 (0.32%)	
Ropivacaine	240 (1.3%)	221 (1.28%)	19 (1.53%)	
Dexamethasone	2844 (15.35%)	2675 (15.48%)	169 (13.6%)	<.0001
Number of Peripheral Nerve Blocks				
0	1863 (10.06%)	1716 (9.93%)	147 (11.83%)	
1	2685 (14.49%)	2576 (14.91%)	109 (8.77%)	
2				
Total Opioid Use (MME) through oral and IV routes	35 ± 45	35 ± 45	32.5 ± 45	0.566
Total Opioid Use (MME) through oral, IV, and PCA routes	35 ± 46.47	35 ± 45	40 ± 59.66	<.0001
Time Between the End of Surgery to Physical Therapist Visit (hours)	5.35 ± 11.77	5.15 ± 11.3	15.77 ± 5.88	<.0001

Table 2: Reasons for Revision

	N=1243	%
Mechanical loosening	461	37.09
Dislocation	248	19.95
Fracture/trauma	159	12.79
Articular surface wear	136	10.94
Periprosthetic infection	68	5.47
Other/Unspecified	171	13.76

Conclusions

- Patients undergoing revision THAs receive distinct neuraxial and PNB combinations
 - fewer blocks
 - greater variability in technique selection
- Mixed-effects modeling demonstrated that surgeon and especially anesthesiologist preferences meaningfully contributed to PNB use patterns

RESULTS

- Revisions had higher ASA indices, longer operative times (126 vs 85 minutes), greater blood loss (200 vs 150 mL), and longer hospital stay (53 vs 30 hours; all p<0.001)
- Neuraxial patterns differed: revisions predominantly received combined spinal-epidurals, primaries predominantly received spinals alone (both p<0.001)
- General anesthesia without neuraxial use was more common among revisions (8.5% vs 4.1%, p<0.001)
- Primary THAs received intraoperative periarticular injections more frequently (76.9% vs 41.2%, p<0.001)
- Median PACU pain scores were lower in revisions, whereas cumulative total opioid use was slightly higher for revisions
- PNB utilization was modest (24.8% primary vs 20.6% revision, p<0.001)
- Primary THAs more often received two blocks (14.9% vs 8.8%, p<0.001), whereas revisions more commonly received one block (11.8% vs 9.9%, p<0.001)
- PENG+fascia iliaca combination was most frequently used but occurred less often in revisions
- Primary surgeries were 1.5 times more likely to receive PNBs than revisions, even after accounting for surgeon variability (OR=1.47, 95% CI 1.23–1.77, p<0.001)
- After adding anesthesiologist as a random effect, the odds ratio increased to 2.33, suggesting anesthesiologist-level differences largely explain PNB use variations