

Surgeon, Hospital, and Patient-Related Factors Effect on Mean Operative Time in Total Hip Arthroplasty

Yash Chaudhry, D.O., Mitchell Solano, M.D., Daniel Valaik, M.D., Robert S Sterling, M.D., Julius Kunle Oni, M.D., Harpal Singh Khanuja, M.D.

¹ Department of Orthopaedics, Johns Hopkins University School of Medicine, Baltimore, MD, USA;

Introduction

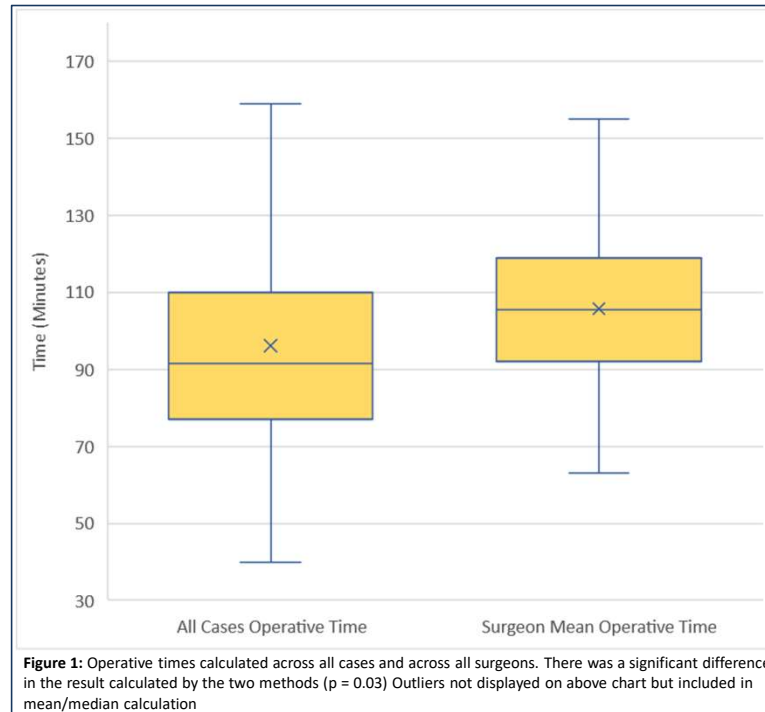
- An accurate assessment for THA operative time is essential: helps determine physician reimbursement via RVU formula²
- Current estimates are limited
 - Surgeon surveys as used by CMS have response rates as low as 2.2%²
 - National databases and registries do not account for surgeon volume^{3,4}
- An estimate is needed that addresses the variety of settings under which THA is performed across the country
 - Surgeon factors: annual THA volume, years of experience, adult reconstruction fellowship
 - Hospital factors: hospital type (academic vs. community), trainee presence
 - Patient factors: ASA status, BMI categories

Materials and Methods

- Retrospective review of all primary THA at a single health system, including 2 urban academic hospitals and 2 suburban community hospitals between 2015-2018
- Total operative time calculated by taking time difference between incision time and case finish time (dressings completed) as documented in medical record
- Mean operative time for each surgeon calculated and assessed for associations with surgeon, hospital, and patient factors
 - Volume categories defined by thresholds determined by Koltsov et al⁵: 0-12, 13-25, 26-72, 73-165, 166-279, 280+
- The calculated mean of surgeon operative times was compared to the mean operative time across all cases

Results

- 3,972 THA conducted by 41 surgeons
 - Mean individual surgeon operative time was 106 ± 21 minutes (**Figure 1**)
 - Mean operative time of all cases was 96 ± 28 minutes
- Hospital type demonstrated significance between surgeon operative times (p<0.01)
- Mean surgeon times were significantly different than mean times across all cases



Characteristic	N (%)		Mean Surgeon Operative Time (min)	P-value
	Cases	Surgeons		
Surgeons	3,972 (100)	41 (100)	106 ± 21	
Patient Factors				
BMI category ^a				
Underweight	36 (0.9)	14 (14) ^b	94 ± 26	.06
Normal Weight	930 (24)	29 (29) ^b	98 ± 19	
Overweight	1,451 (37)	36 (36) ^b	102 ± 24	
Obese	1,415 (36)	32 (32) ^b	107 ± 20	
Morbidly Obese	120 (3)	20 (20) ^b	115 ± 34	
ASA-PS score				
1	231 (6)	24 (22) ^b	106 ± 26	.84
2	2,566 (65)	35 (34) ^b	101 ± 20	
3	1,107 (28)	34 (33) ^b	106 ± 22	
4	19 (0.5)	11 (11) ^b	105 ± 40	
Surgeon Factors				
Fellowship trained				
Yes	3,230 (81)	14 (34)	102 ± 22	.38
No	742 (19)	27 (66)	108 ± 21	
Experience, y ^c				
0-10	305 (7.7)	11 (27)	115 ± 26	.45
11-20	2,647 (67)	15 (37)	102 ± 17	
21-30	719 (18)	10 (24)	102 ± 24	
>30	301 (7.5)	5 (12)	104 ± 16	
Surgeon THA Volume ^d				
Very Low	261 (6.6)	23 (56)	109 ± 23	.16
Low	607 (15)	9 (22)	112 ± 15	
Medium	344 (9)	2 (5)	93 ± 4	
High	1,385 (35)	5 (12)	86 ± 15	
Very High	1,375 (35)	2 (5)	100 ± 34	
Hospital Factors				
Hospital type				
Academic	1,111 (28)	12 (28) ^b	125 ± 21	<.01
Community	2,861 (72)	31 (72) ^b	101 ± 20	
Trainee presence				
None	2,320 (58)	36 (72) ^b	103 ± 24	.29
Trainee	1,652 (42)	14 (28) ^b	111 ± 21	

Conclusion

- Estimates for THA operative time should account for the variety of surgeon, hospital, and patient-related settings under which THA is conducted across the country
 - Using surgeon mean operative time may be more reflective of the actual time it takes an individual surgeon
- Longer operative times than reported in many other studies, particularly those with nationwide databases (NSQIP: between 91-94 minutes^{3,4})
- Although many of these factors did not demonstrate significance, this may have been limited by the small sample size of our study

References:

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