

Characterizing Total Hip Arthroplasty Exposure During Orthopaedic Surgery Residency

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INTRODUCTION:

Total hip arthroplasty (THA) has trended towards increased utilization of the direct anterior (DA) approach and robotic-assistance (RA) in recent years. As the landscape of THA continues to evolve, the specific techniques emphasized during orthopaedic surgery residency remain unclear. This study aims to characterize trainee exposure to different techniques during residency and assess comfort performing specific stages of THA. Secondary outcomes include identifying differences in techniques observed based on post-graduate year (PGY) or residency program region or setting.

METHODS:

This cross-sectional study anonymously surveyed orthopaedic surgery residents using 21-multiple choice questions. Demographic and residency program information, exposure to THA approaches, and confidence performing different stages were collected. Orthopaedic surgery residency program coordinators were emailed the survey and asked to forward to their residents. Survey responses were collected using REDCap electronic data capture tool. Descriptive statistics were performed to determine frequencies of exposure to THA approaches and comfort levels by approach. Kruskal-Wallis tests were performed to compare exposure rates to different surgical approaches, surgical exposure by program region, setting, and PGY. Ordinal logistic regression was performed to compare comfort with approach most seen to approach most exposed to, PGY training year, program region, and program setting. A threshold of p -value less than 0.05 was used to determine statistical significance.

RESULTS:

Eight-five residents responded to the survey. All participants had been exposed to total hip arthroplasty in residency. Years of training were evenly represented, with most respondents from Northeast programs (42.3%) and university hospital-based programs (51.8%). Of all participants, 56 (65.9%) responded that over half of THAs done at their residency program utilized the DA approach while 20 (23.5%) responded that posterior approach was utilized for majority of cases (**Figure 1**). Seventy-two (84.7%) participants stated they had no exposure to supercapsular approaches while 32 (37.6%) and 44 (51.8%) responded the same for anterolateral and direct lateral, respectively. Of the participants, 44 (51.8%) responded that 0% of THAs at their institution are performed with RA (**Figure 2**). No participants responded that 100% of THAs at their institution are performed with either a singular approach or with robotic assistance.

Fifty-five (64.7%) participants responded that they were comfortable or very comfortable with the approach they have most seen while 13 (15.3%) responded they were uncomfortable or very uncomfortable (**Table 1**). Participants responded that they were allowed the most autonomy with posterior (48.2%) and direct anterior (30.6%) approaches. Sixty-eight (80%) participants responded that they are satisfied or very satisfied with their primary THA experience during training. Regarding future practice plans, 42 (49.4%) responded they were planning on performing THAs in practice with 59 (69.4%) stating they would use DA approach and 23 (27.1%) responding they would use posterior approach. Almost half (49.4%) of participants said they would not use RA for primary THA in future practice while 32 (37.7%) were undecided.

Regression analysis revealed that compared to posterior approach, residents who were most exposed to DA reported lower levels of comfort ($p=0.029$), while this did not hold true other approaches. Compared to PGY-1 residents, residents of PGY-2 had similar levels of comfort ($p=0.129$), while PGY-3 ($p<0.001$), PGY-4 ($p<0.001$), and PGY-5 ($p<0.001$) had greater levels of comfort. Residents at programs of all regions and settings had similar levels of comfort.

Kruskal-Wallis test found a significant difference between program region and exposure to DA ($p<0.001$), anterolateral ($p=0.011$), direct lateral ($p=0.008$), posterior ($p=0.002$), and supercapsular ($p=0.005$) approaches. There was a significant correlation between program setting and exposure to DA ($p=0.004$), and supercapsular ($p=0.004$) approaches. Analysis revealed a significant correlation between PGY year and comfort level with the approach most seen ($p<0.001$). There was a significant correlation between program region and approach planned to use in future practice ($p=0.021$) as well as with training level deemed appropriate to perform femoral preparation ($p=0.049$). There was also a significant correlation between program setting and overall satisfaction with THA experience ($p=0.003$) as well as with training level deemed appropriate to perform femoral preparation ($p=0.036$) and acetabular preparation ($p=0.038$).

DISCUSSION AND CONCLUSION: The increase in popularity of the direct anterior approach in THA has also been realized in orthopaedic resident training. Most current trainees are satisfied with their experience and receive exposure to multiple techniques. There are significant differences between program region and setting with respect to resident experience.

Table 1. Resident Comfort and Opinion by Approach.	
Comfortable	58(75%)
Comfort with approach most commonly seen performed	
Amniotomyl	7(9.2%)
Direct	17(21.8%)
Posterior	21(26.9%)
Supercapsular	34(43.8%)
Very comfortable	
Yes	42(48.4%)
No	28(33.9%)
Uncomfortable	
Which approach would you most commonly see for primary THA?	
Direct anterior	29(36.4%)
Amniotomyl	7(9.2%)
Direct lateral	11(14.1%)
Posterior	23(29.3%)
Supercapsular	6(8.0%)
Performance primary THA with robotic assistance has enhanced my overall understanding	
Strongly agree	4(4.7%)
Agree	11(13.9%)
Neutral	17(21.7%)
Disagree	6(7.7%)
Strongly disagree	6(7.7%)
Would you utilize robotic assistance for primary THA?	
Yes	11(13.9%)
No	42(48.4%)
Unsure	32(39.7%)
What PCV level is appropriate for performing the femoral preparation?	
PCV-1	18(22.5%)
PCV-2	47(59.4%)
PCV-3	24(30.2%)
PCV-4	1(1.3%)
PCV-5	1(1.3%)
Autoplexy follow	0(0.0%)
Autoplexy standing	0(0.0%)
What PCV level is appropriate for performing the acetabular preparation?	
PCV-1	1(1.3%)
PCV-2	26(33.2%)
PCV-3	37(46.9%)
PCV-4	17(21.8%)
PCV-5	4(4.7%)
Autoplexy follow	0(0.0%)
Autoplexy standing	1(1.3%)
What PCV level is appropriate for performing the approach?	
PCV-1	12(14.1%)
PCV-2	26(33.2%)
PCV-3	27(34.4%)
PCV-4	8(10.1%)
PCV-5	1(1.3%)
Autoplexy follow	0(0.0%)
Autoplexy standing	0(0.0%)
Which approach do you observed the most autonomy with respect to walk times?	
Direct anterior	26(33.2%)
Amniotomyl	7(9.2%)
Direct lateral	8(10.1%)
Posterior	41(48.4%)
Supercapsular	6(8.0%)
No difference	14(17.7%)
How satisfied are you with your primary THA experience at your training program?	
Very dissatisfied	0(0.0%)
Dissatisfied	4(4.7%)
Neutral	13(16.5%)
Satisfied	25(31.6%)
Very satisfied	41(48.4%)
Which changes would improve your overall experience at your training program?	
I am satisfied with my experience	46(54.1%)
More autonomy during cases	28(35.4%)
Exposure to additional primary THA approaches	26(32.9%)
Experiencing a better balance of primary THA approaches	21(24.7%)
More robotic assistance use during primary THA	14(17.7%)
I am satisfied, amenable and during primary THA	11(13.9%)
Other/None/Not sure/Unsure/Other	1(1.3%)

Figure 1. Exposure by Approach.

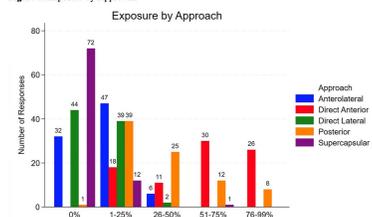


Figure 2. Exposure to Robotic Assistance.

