

The Impact of Resident Involvement on Surgery for Pelvic Organ Prolapse

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Introduction

- 245,970 pelvic organ prolapse repairs annually by 2050, many involving trainees¹
- Ob Gyn residencies require urogynecology rotations where residents assist surgically
- Carter et al. showed fellows compared to PA first assistants increased sacral colpopexy OR time by 34 minutes without increasing complications²
- Do residents compared to PA first assistants increase OR times and complications?

Methods

- Retrospective cohort study, all apical prolapse repairs 06/2016 to 07/2020, single attending assisted by resident (RES) or PA
- Primary outcome: operative time
 - skin incision to skin closure measured in minutes
- Secondary outcome: composite of any complication
 - bowel injury, bladder injury, transfusion, conversion to laparotomy, mesh exposure, readmission, post operative infection
- Data analysis:
 - Chi-squared and Fischer's exact and *t* tests compared RES vs. PA
 - Linear regression to identify factors impacting operative time
 - Logistic regression to identify factors impacting complications

Results

- 108 apical prolapse repairs included, 77 (71.3%) RES and 31 (28.7%) PA
- Groups similar at baseline for demographic variables, pre-op prolapse stage, concomitant procedures
- 36 (33.3%) L/S ASC, 5 (4.6%) L/S USLS, 31 (28.7%) vaginal USLS, 15 (13.9%) vaginal SSLS, and 21 (19.4%) colpocleisis
- Predominantly White (78.4%), postmenopausal (82.1%) with age 60.43 ±13.69 and BMI 28.6±6.2 kg/m²
- Primary Outcome: Operative Time was 49 minutes longer with RES cases

Table 1: Operative time linear regression

Covariates	Unadjusted		Adjusted	
	β (mins)	p-value	β (mins)	p-value
Resident as first assistant	31.8	0.045	49.0	<0.001
Vaginal approach (compared to laparoscopic approach)	-48.4	<0.001	-62.5	<0.001
Body Mass Index (per unit)	2.3	0.043	3.1	0.002
Concomitant hysterectomy	66.6	<0.001	71.8	<0.001
Concomitant midurethral sling	42.6	0.121	59.1	0.007
Constant	N/A	N/A	155.7	N/A

Positive β-values signify increased OR time in minutes, negative β-values signify time decrease

- Secondary Outcome: Complications
 - Complications occurred in 22 cases, 19 (24.7%) RES vs 3 (9.7%) PA, *p*=0.11
 - UTIs most common complication, *n*=12, 10 (13.0%) RES vs. 2 (6.5%) PA (*p*=0.503)
 - All other complications occurred in RES group
 - Bladder injury: 1 (1.3%)
 - Bowel injury: 2 (2.6%)
 - Conversion to laparotomy: 4 (5.2%)
 - No mesh exposures, transfusions, post-op infections, small bowel obstruction/ileus
 - Logistic regression: RES group had increased complications but this was largely driven by UTIs which were of little consequence

Table 2: Multivariable logistic regression for complications

Covariates	Unadjusted		Adjusted	
	OR	95% CI	OR	95% CI
Resident as first assist	3.11	0.85- 11.40	10.84	1.81-64.79
Past medical history: stroke	6.55	1.02-41.98	31.25	1.43-1,000
Past medical history: coronary artery disease	3.56	0.87-14.57	16.01	2.22-115.63
Concomitant midurethral sling	3.20	0.66-15.49	8.82	1.05-74.04
POP-Q stage	0.26	0.09-0.72	0.19	0.04-0.82
First case of the day	0.28	0.09-0.88	0.10	0.002-0.52

Conclusion

- RES increased the operative time by 49.0 minutes (~30% longer)
 - Consistent with Carter-Brooks et al. data for fellows
- Complications 10 times as likely with RES
 - Inconsistent with most studies²⁻⁴
 - Difference mostly due to increased UTI rate with little consequences
 - Patients' safety likely not significantly compromised while allowing residents to gain surgical experience
- Strengths
 - Strong internal validity: single surgeon performing all surgeries
- Weaknesses
 - Two hospitals with potentially variable workflow and staff included
 - Baseline skills of RES not assessed
 - Unable to determine how much of the procedure RES performed
- Future directions
 - Which steps of the procedure have a bigger impact on time differences observed
 - Does the learning curve (RES cases completed) modulate impact of RES involvement
 - Can simulation training reduce the time difference between RES and PA

Results

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