



P1.182: Concurrent Robotic and Open Thoracic Surgery Training Enhances Surgical Skill Acquisition in Early-Career Surgeons

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IASLC 2026 World
Conference on Lung Cancer
SEPTEMBER 12 - 15, 2026
SEOUL, REPUBLIC OF KOREA

INTRODUCTION

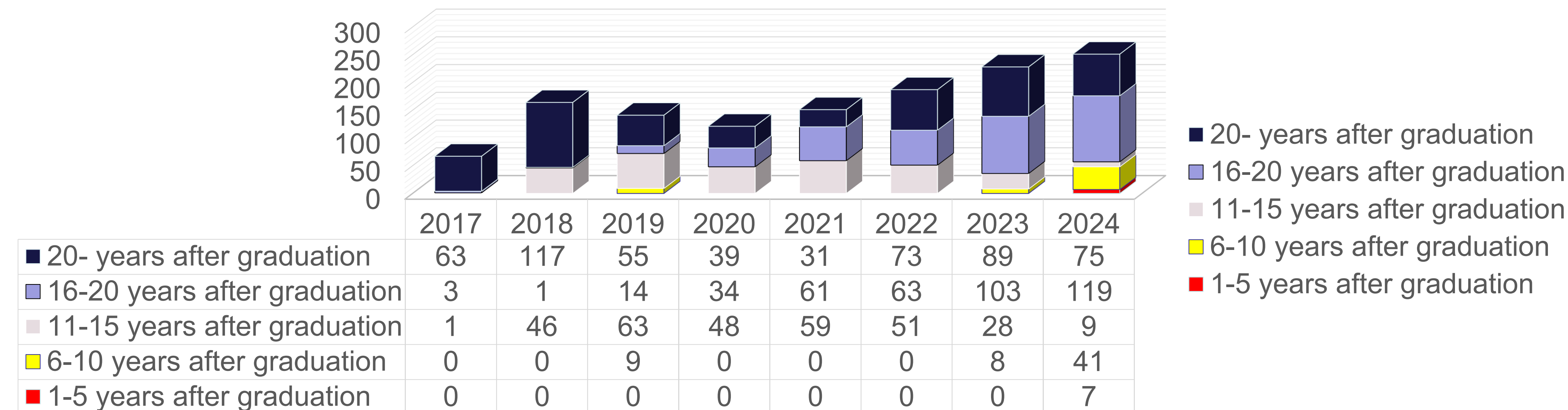
Robotic-assisted thoracic surgery (RATS) is increasingly adopted as a standard minimally invasive approach in thoracic surgery. However, open thoracotomy (OPEN) remains essential for complex resections and urgent situations. Establishing an effective training strategy that integrates both techniques is critical, particularly for early-career surgeons. This study aimed to evaluate whether concurrent exposure to RATS and OPEN facilitates safe implementation and accelerates surgical skill acquisition.

METHODS

We retrospectively analyzed all thoracic procedures performed at our institution between 2017 and 2024, including both RATS and OPEN cases. Surgeons were categorized as early-career (≤ 10 years after graduation) or senior (> 10 years). Perioperative outcomes, including operative time, blood loss, and postoperative hospital stay, were compared between groups. A standardized instrument strategy was implemented to promote technical consistency across approaches (RATS: spatula in the right hand and Cadiere forceps in the left; OPEN: electrocautery in the right hand and forceps in the left). Additionally, a structured survey assessed early-career surgeons' perceptions of RATS adoption and skill transfer to OPEN procedures.

RESULTS

The number of robotic surgery cases (By years since graduation)



→ The number of cases performed by young surgeons is increasing dramatically.

Comparison between early-career and senior surgeons

Variables	Early-career n=42	Senior n=691	p-value
Age, median (range)	71 (38-84)	69 (26-92)	0.2721
Sex, man	19 (45%)	303 (44%)	0.8603
Right/Left	23/19	427/264	0.8472
Tumor size (mm), median (range)	20 (7-88)	21 (1-135)	0.8860
Operative time (min), median (range)	173.5 (97-315)	164 (84-413)	0.3987
Console time (min), median (range)	132.5 (63-235)	112 (41-330)	0.0506
Blood loss (ml), median (range)	5 (0-30)	5 (0-2460)	0.6193
Lobectomy/Segmentectomy	22/20	447/244	0.1431
Reoperation for postoperative complication	0 (%)	10 (1.4%)	0.4325
Postoperative hospital stay (days), median (range)	5 (2-17)	5 (2-43)	0.5926
Postoperative complication (CD grade $\geq$ IIIa)	2 (5%)	96 (14%)	0.0914
Thirty-day mortality	0 (%)	1 (0.1%)	0.8051

Early-career ≤ 10 year after graduation without thoracic surgery professional license

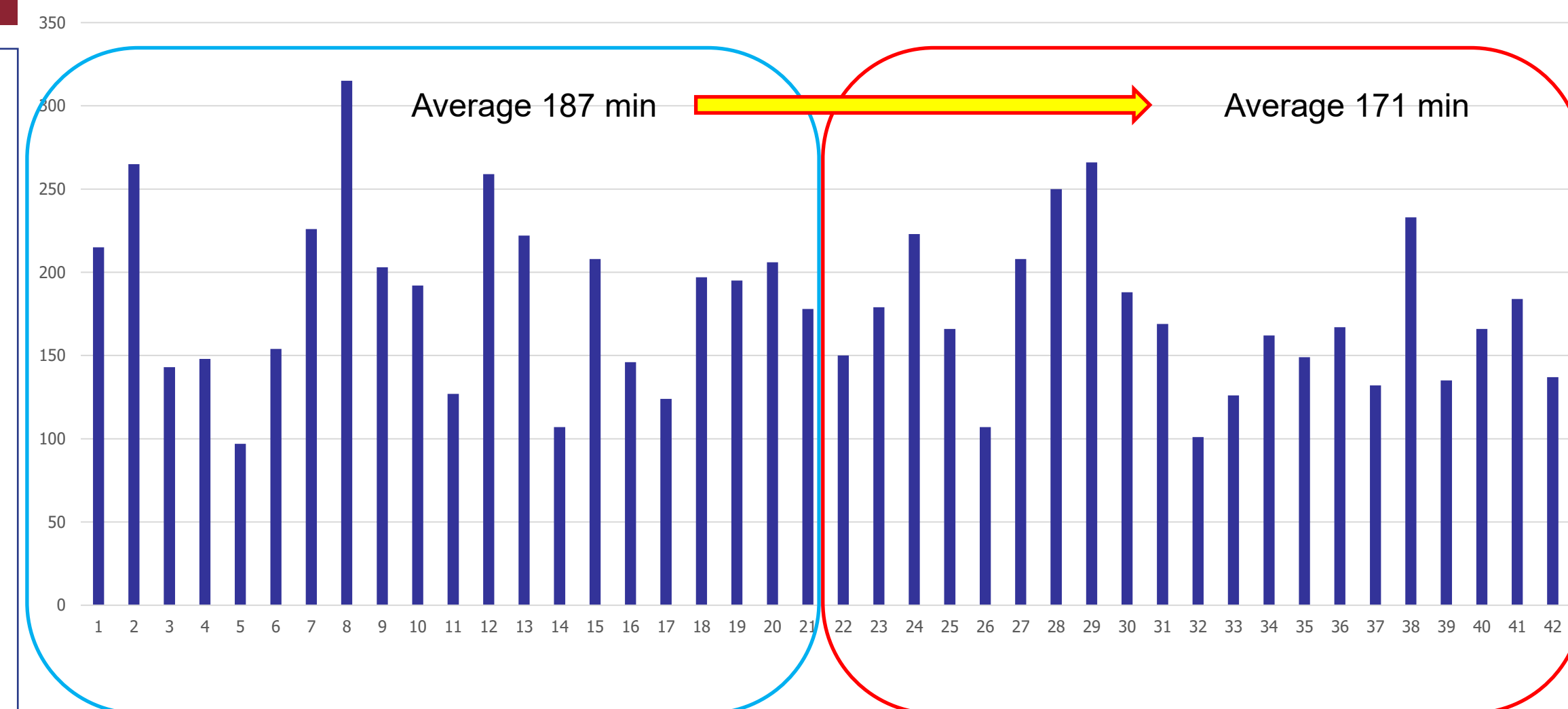
Surgical differences by operative approach

	OPEN	VATS	RATS
View	3D	2D, magnified view	3D, magnified view
Operative field	Non-stabilize	Non-stabilize	stabilize
Operability	○	△	○
Shaking	▲	△	○
Wound	▲	○	○
Feedback	○	○	▲
Cost	○	○	▲

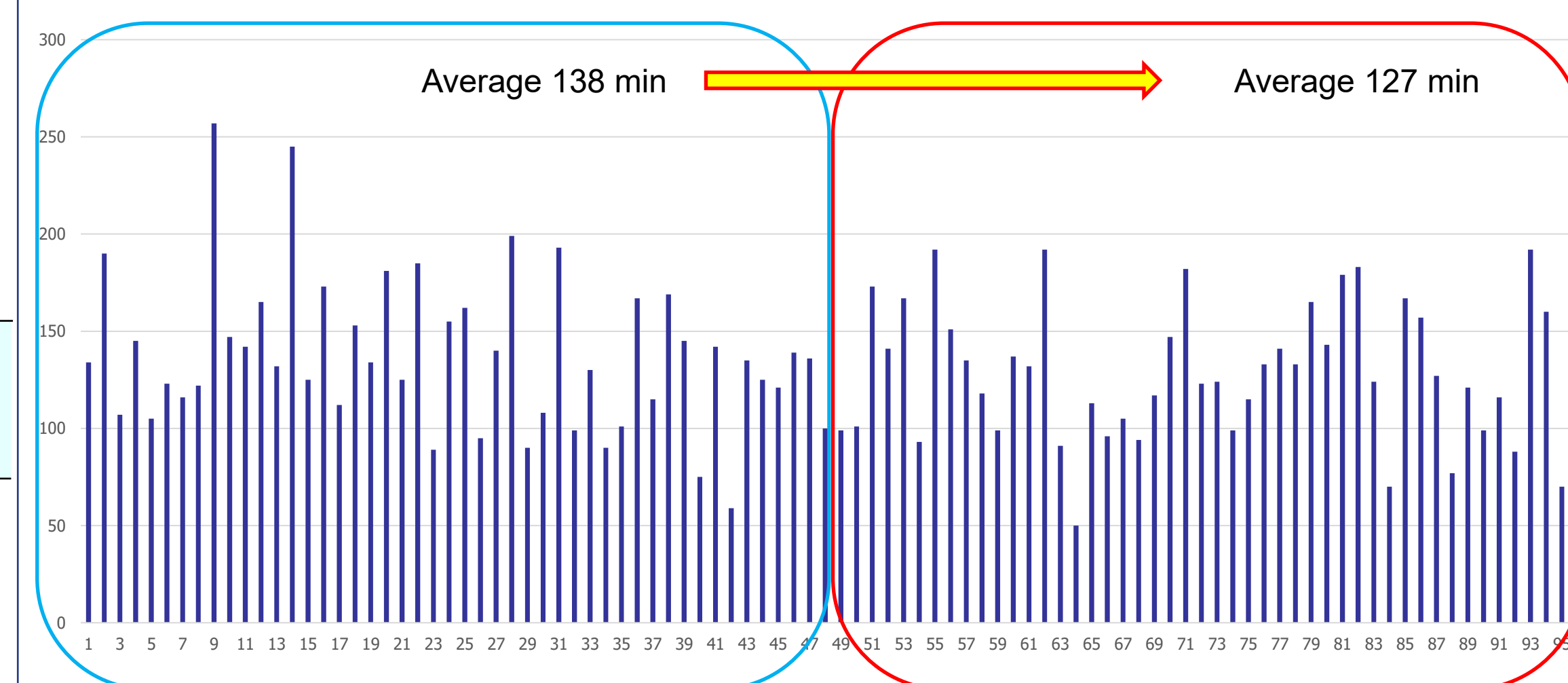
→ Learning open surgery and robotic surgery simultaneously creates a synergistic effect

○; advantage ▲; disadvantage
VATS; video-assisted thoracic surgery
RATS; robot-assisted thoracic surgery

Robotic anatomical lung resection (young surgeon)



Open thoracotomy (young surgeon)



The operative time gradually decreased with increasing experience gained from performing robotic and open procedures in parallel.

DISCUSSION AND CONCLUSION

Concurrent training in RATS and OPEN is safe and may enhance overall surgical proficiency in early-career surgeons. Beyond facilitating the adoption of minimally invasive techniques, robotic experience appears to translate into improved performance in conventional OPEN procedures. These research findings support the possibility of a paradigm shift in surgical training, suggesting that integrated experience in both robot-assisted surgery and open surgery will play a central role in accelerating skills development.