



Neoadjuvant Immunotherapy and Surgical Outcomes in Non-Small Cell Lung Cancer: A Nationwide VA Cohort Study

Benjamin Scott, MD^{1,2}; Edward Ward, MD^{1,3}; Irina Veytsman, MD⁴; Jared Antevil, MD^{1,2,5}; Gregory Trachiotis, MD^{1,5}

1. Division of Cardiothoracic Surgery and Heart Center, Washington DC Veterans Affairs Medical Center, Washington, DC, USA 2. Department of Surgery, Uniformed Services University Walter Reed National Military Medical Center, Bethesda, MD, USA 3. Department of Surgery, Medstar Georgetown University Hospital, Washington, DC, USA4. Department of Oncology, Washington DC Veterans Affairs Medical Center, Washington, DC, USA 5. Department of Surgery, George Washington University Hospital, Washington, DC, USA

INTRODUCTION

- Neoadjuvant immunotherapy represents an emerging treatment in Non-Small Cell Lung Cancer (NSCLC)
- Promising early data, but limited real-world evidence on outcomes
- Lung cancer is the second leading cause of death in US Veterans
- Purpose: evaluate the impact of neoadjuvant immunotherapy on perioperative outcomes in US veteran population with locally advanced, resectable NSCLC

METHODS

- Retrospective, nationwide cohort study of Veterans with locally advanced NSCLC that received neoadjuvant therapy followed by surgical resection
- Time period – January 1, 2016, to September 26, 2024
- Study groups: (1) Neoadjuvant immunotherapy plus chemotherapy, followed by surgical resection versus (2) Neoadjuvant chemotherapy alone, followed by surgical resection
- Data obtained from the Veterans Affairs Informatics and Computing Infrastructure (VINCI) database
- Propensity score matching of 16 clinical covariates to create balanced cohorts for comparison, leading to 28 matched pairs
- Primary outcome – differences in perioperative outcomes (cardiac arrest, return to operating room, stroke, deep venous thrombosis, failure to wean from ventilator, pulmonary embolism, reintubation)

RESULTS

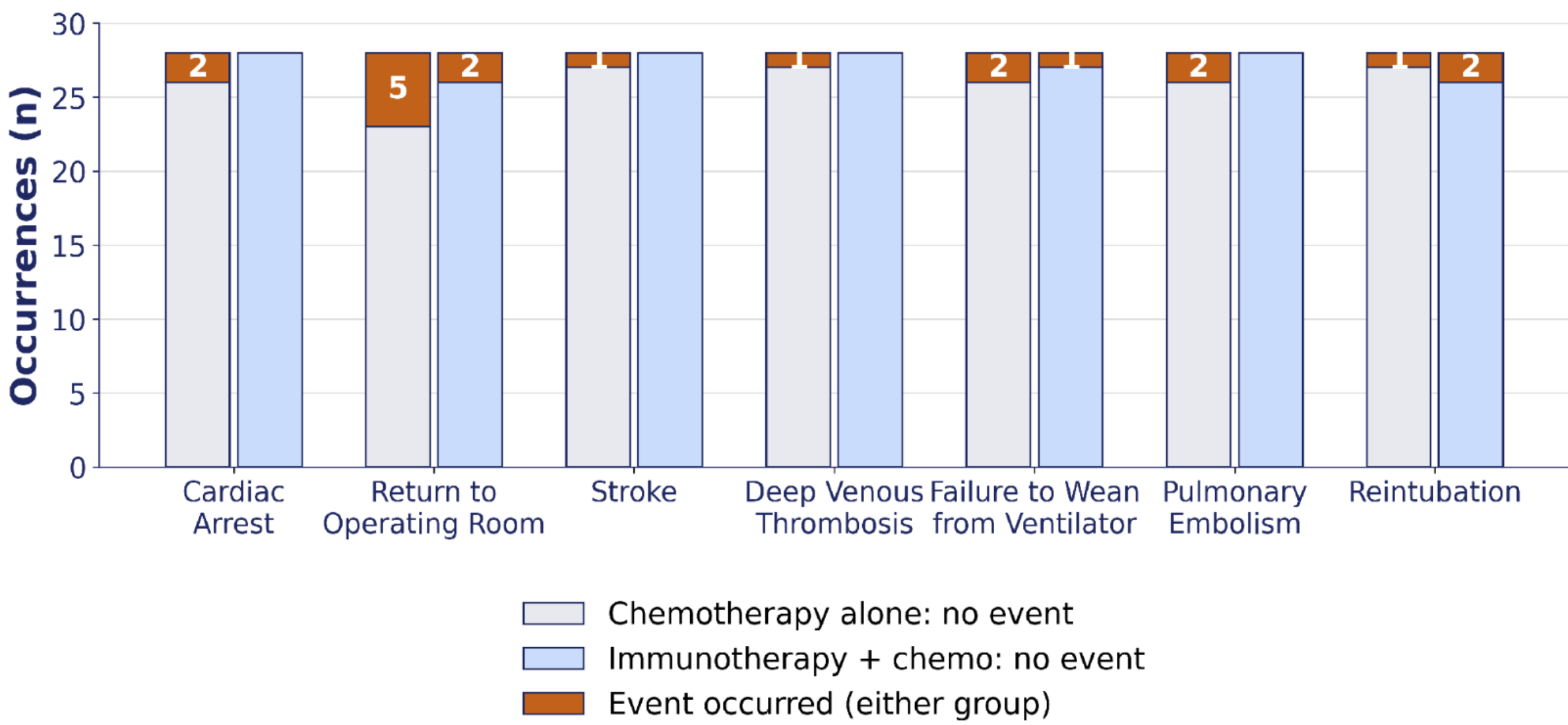


Figure 1. Propensity score matched comparison of perioperative outcomes between Neoadjuvant Immunotherapy + Chemotherapy versus Neoadjuvant chemotherapy alone across 28 matched pairs.

Outcome	Total (n = 114)	Immunotherapy + Chemotherapy (n = 28)	Chemotherapy Only (n = 28)	p-value (Fisher's exact)
Cardiac arrest	2 (1.8%)	0 (0.0%)	2 (7.1%)	0.49
Return to OR	7 (6.1%)	2 (7.1%)	5 (17.9%)	0.67
Stroke	1 (0.9%)	0 (0.0%)	1 (3.6%)	NA
Deep venous thrombosis	1 (0.9%)	0 (0.0%)	1 (3.6%)	NA
Failure to wean from ventilator	3 (2.6%)	1 (3.6%)	2 (7.1%)	1.00
Pulmonary embolism	2 (1.8%)	0 (0.0%)	2 (7.1%)	1.00
Reintubation	3 (2.6%)	2 (7.1%)	1 (3.6%)	1.00

Table 1. Fisher's exact test comparisons of perioperative outcomes in propensity score matched cohort.

Immunotherapies, n (%)	
Nivolumab	26 (89.6%)
Pembrolizumab	3 (10.3%)
Number of cycles, n ± std dev	2.8 ± 0.7
Avg. time from last cycle to surgery, months ± std dev	1.8 ± 0.8

Table 2. Most common immunotherapies, number of cycles, and time from last cycle to date of surgery

Characteristic	Total	Immunotherapy + Chemotherapy	Chemotherapy Only
Veterans, n	114	29	85
Average age, y ± std dev	67.9 ± 6.8	69.2 ± 7.7	67.5 ± 6.5
Gender, n (%)			
Male	108 (94.7%)	28 (96.5%)	80 (94.1%)
Female	6 (5.3%)	1 (3.5%)	5 (5.9%)
Histology, n (%)			
Adenocarcinoma	70 (61.4%)	19 (65.5%)	51 (60.0%)
Squamous Cell Carcinoma	44 (38.6%)	10 (34.5%)	34 (40.0%)
Surgery, n (%)			
Thoracoscopy	60 (52.6%)	15 (51.7%)	45 (52.9%)
Thoracotomy	4 (3.5%)	0 (0.0%)	4 (4.7%)
Other	50 (43.9%)	14 (48.3%)	36 (42.4%)
Resection, n (%)			
Sublobar	9 (7.9%)	0 (0.0%)	9 (10.6%)
Lobectomy	88 (77.2%)	26 (89.7%)	62 (73.0%)
Bilobectomy	9 (7.9%)	2 (6.9%)	7 (8.2%)
Pneumonectomy	3 (2.6%)	1 (3.4%)	2 (2.4%)
Not Listed	5 (4.4%)	0 (0.0%)	5 (5.9%)
Nodes Examined, n (%)			
0	5 (4.4%)	0 (0.0%)	5 (5.9%)
<10	36 (31.6%)	8 (27.6%)	28 (33.0%)
>10	65 (57.0%)	20 (69.0%)	45 (52.9%)
Unknown	8 (7.0%)	1 (3.4%)	7 (8.2%)
Treatment at Designated Cancer Center, n (%)	64 (56.1%)	21 (72.4%)	43 (50.6%)
Most Common Chemotherapy Regimens, n (%)			
Carboplatin + Paclitaxel	38 (33.3%)	17 (58.6%)	21 (24.7%)
Cisplatin + Alimta	15 (13.1%)	2 (6.9%)	13 (15.3%)
Carboplatin + Alimta	12 (10.5%)	4 (13.8%)	8 (9.4%)
Other	49 (43.0%)	6 (20.7%)	43 (50.6%)

Table 3. Basic demographic, histologic, surgical, and chemotherapy data from the overall, unmatched cohort of included patients.

CONCLUSION

- Early, real-world findings in Veterans demonstrate no significant differences in perioperative outcomes
- Larger cohorts and longer-term data are essential in determining true clinical impact