

## Thoracoscopic Lobectomy after Neoadjuvant Chemoradiation

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<b>Disclosure Information</b>	Authors and Co-authors have no relevant financial relationships to declare.
<b>Supplemental Video</b>	<a href="#">Supplemental Video</a>
<b>Category</b>	Surgery & Surgery Subspecialties

### Abstract

**Background:** Non-small cell lung cancer remains the most common cause of neoplastic mortality in the United States. Surgical resection of early stage non-small cell lung cancer (NSCLC) is recommended as first line intervention, however later stage, advanced local-regional cancers (Stage IIIa) often are treated with neoadjuvant chemotherapy and radiation therapy prior to consideration of surgical resection. Preoperative radiation, and to a lesser extent chemotherapy, increases the complexity of surgical resection due to development of dense inflammatory tissue, edema, and scarring adhesions. The increased difficulty in post chemoradiation therapy (CRT) patients has resulted in slow adoption of minimally invasive techniques for post-neoadjuvant resection. In the past, surgical resection for NSCLC has been proven to be efficacious after CRT, but the available data focuses mostly on open-chest procedures. The aim of our study was to demonstrate that there was no difference in surgical outcomes when performing minimally invasive thoracoscopic lobectomy after neoadjuvant chemoradiotherapy.

**Methods:** An IRB-approved, retrospective analysis of an institutional RedCap database was conducted of 275 patients who underwent lobectomy between the years 2014 and 2019 at a single institution. Baseline variables, demographics, surgical procedure data, pathologic findings, and postoperative outcomes were collected. Statistical analysis of continuous and categorical data was conducted to compare outcomes of patients undergoing thoracoscopic lobectomy with history of neoadjuvant CRT, chemotherapy only, and radiation only to those with no CRT. Statistics were performed using a standard ANOVA for the continuous data and Fischer's Exact chi square test for the categorical data in SPSS.

**Results:** There were no differences between the neoadjuvant CRT, chemotherapy only, and radiation only groups versus no CRT groups with respect to age, gender, BMI, presence of pulmonary disease, presence of cardiovascular disease, preoperative FEV1, estimated blood loss, length of hospital stay, ICU stay, days on ventilator, chest tube duration, presence of air leak, presence of post-op general complications, nor 30 day and 60 day mortalities. There were significant differences between the groups for the demographic categories of preoperative DCLO, smoking history, and current smoking status, and also in postoperative outcomes in the presence of lower rates of post-op pulmonary complications in the radiation only group. See Table 1.

**Conclusions:** There were no significant differences found in surgical outcomes for thoracoscopic lobectomy after neoadjuvant therapies when compared to patients who went directly to surgery. The exception was a lower rate of pulmonary complications seen in radiation only patients, which may be attributable to selection bias, sample size, or the lower rate of current smokers in the radiation only group. In any case, the data indicates that thoracoscopic lobectomy after neoadjuvant chemo/radiation is a safe option for patients with advanced regional non-small cell lung cancer.

### Learning Objectives

- 1) standard of care for NSCLC
- 2) options for treatment of NSCLC

## Tables and/or Figures

		No CRT N = 183	CRT N = 22		Cemo Only N = 9		Radiation Only N = 61	
	Variable Analyzed	Result	Result	P-Value	Result	P-Value	Result	P-Value
		ANOVA = Mean (Standard Deviation)						
		X2 = %						
Demographic	Age	64.346 (9.614)	62.286 (11.963)	0.905	66.889 (9.532)	0.949	66.383 (9.426)	0.664
	Female %	53.8	52.4	0.899	33.3	0.229	50.0	0.605
	BMI	28.223 (5.841)	26.558 (5.925)	0.741	26.626 (3.518)	0.934	27.128 (4.749)	0.728
	Pulmonary Disease %	42.9	28.6	0.208	11.1	0.059	33.3	0.192
	Cardiac Disease %	26.9	14.3	0.209	55.6	0.063	33.3	0.340
	FEV1 (% predicted)	77.500 (18.849)	78.813 (14.275)	0.999	76.788 (20.081)	1.000	80.500 (17.653)	0.820
	DLCO (% predicted)	67.52 (16.91)	55.151 (16.279)	0.046	62.586 (13.724)	0.943	65.552 (16.355)	0.947
	Smoking History %	91.8	81.0	0.107	66.7	0.012	86.7	0.244
	Current Smoker %	48.4	14.3	0.003	11.1	0.029	23.3	0.001
Postoperative Outcome	Estimated Blood Loss (mL)	110.057 (160.492)	109.500 (109.891)	1.000	68.889 (128.787)	0.994	68.509 (82.619)	0.890
	Length of Stay (days)	4.714 (3.317)	4.095 (2.047)	0.981	5.667 (2.179)	0.978	5.400 (7.652)	0.875
	ICU Stay (days)	0.432 (2.134)	0.150 (0.489)	0.981	0.333 (1.000)	1.000	0.350 (2.711)	0.999
	Ventilator (days)	0.273 (1.905)	0.050 (0.224)	0.989	0.000 (0.000)	0.994	0.383 (2.719)	0.996
	Chest Tube Duration (days)	5.060 (5.571)	4.476 (4.854)	0.996	8.889 (7.785)	0.461	6.683 (8.943)	0.491
	Air Leak (days)	1.363 (3.005)	1.095 (2.166)	0.999	5.000 (6.745)	0.181	3.283 (8.465)	0.062
		37.2	38.1	0.938	22.2	0.362	15.0	0.001
	Post-op Pulmonary Complications %							
	Post-op General Complications %	28.0	19.0	0.381	44.4	0.288	23.3	0.477
	30-day Mortality %	1.6	0.0	0.553	0.0	0.698	0.0	0.317
	60-Day Mortality %	1.7	0.0	0.552	0.0	0.697	1.7	0.996

Table 1. Invasive Groups Compared to No CRT