

Evaluating the Conditional Survival Benefit of Minimally-Invasive Lobectomy in Early-Stage Non-small Cell Lung Cancer

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INTRODUCTION

- In traditional survival (TS) analyses, minimally invasive (MIS) lobectomy has been shown to be non-inferior to open lobectomy in the surgical management of non-small cell lung carcinoma (NSCLC)
- The conditional survival (CS) of NSCLC patients treated with MIS lobectomy remains unexplored, offering an opportunity to understand oncologic differences between these approaches

AIM

To evaluate traditional survival and conditional survival in a large cohort of patients with early-stage NSCLC managed with MIS lobectomy

METHODS

- Review of the National Cancer Database (NCDB) from 2004-2019
- Identified patients with stage IA1/IA2 NSCLC who underwent upfront lobectomy
- Stratified patients via operative approach (MIS or thoracotomy)
- Multivariable TS and CS (assessed yearly up to 5 years post resection) analysis performed
 - CS defined by: $CS(x|y) = \frac{S(y+x)}{S(y)}$

	MIS		Open		Total		p value
	N	%	N	%	N	%	
Sample Size	12,252	52.0	11,318	48.0	23,570	100	
Age (median/SD)	66 (9)		65 (10)		65 (10)		
Female Sex	7,682	62.7	6,793	60.0	14,475	61.4	<0.001
CDS = 0	6,418	52.4	5,664	50.0	12,082	51.3	0.003
Tumor Size (mm)	14 (4)		15 (4)		15 (4)		<0.001
LVI	1,261	10.3	1,123	9.9	2,384	10.1	0.153
Tumor Grade							<0.001
I	2,884	23.5	2,895	25.6	5,779	24.5	
II	5,026	41.0	4,780	42.2	9,806	41.6	
III	2,497	20.4	2,414	21.3	4,911	20.8	
IV	72	0.6	71	0.6	143	0.6	
Unknown	1,773	14.5	1,158	10.2	2,931	12.4	
Receipt of Adjuvant Therapy	871	7.1	858	7.6	1,729	7.3	0.165
Harvest LN							<0.001
< 10*	6,511	53.1	6,898	61.0	13,409	56.9	
≥10	5,741	46.9	4,420	39.1	10,161	43.1	
Positive Margin	129	1.1	148	1.3	277	1.2	0.070
Histology							<0.001
Adenocarcinoma	8,610	70.3	7,573	66.9	16,183	68.7	
Squamous Cell Carcinoma	2,044	16.7	2,169	19.2	4,213	17.9	
Other	1,598	13.0	1,576	13.9	3,174	13.5	

Abbreviations: SD: standard deviation; CDS: Charlson-Deyo Score, LVI: lymphovascular invasion; LN: lymph nodes
*or unknown number of LN harvested

Table: Clinicopathologic characteristics RESULTS

- 23,570 patients met inclusion criteria ([Table](#))
 - 12,252 (52.0%) underwent MIS
 - 11,318 (48.0%) underwent thoracotomy
- TS confirmed survival benefit for MIS (hazard ratio [HR]: 0.91, p=0.002). CS showed survival benefit 1 and 2 years post resection (HR: 0.93, p=0.044 and HR: 0.91, p=0.014, respectively), but equivalence 3, 4, and 5 years following resection (p=0.107, p= 0.315, p=0.832, respectively; [Figure](#))

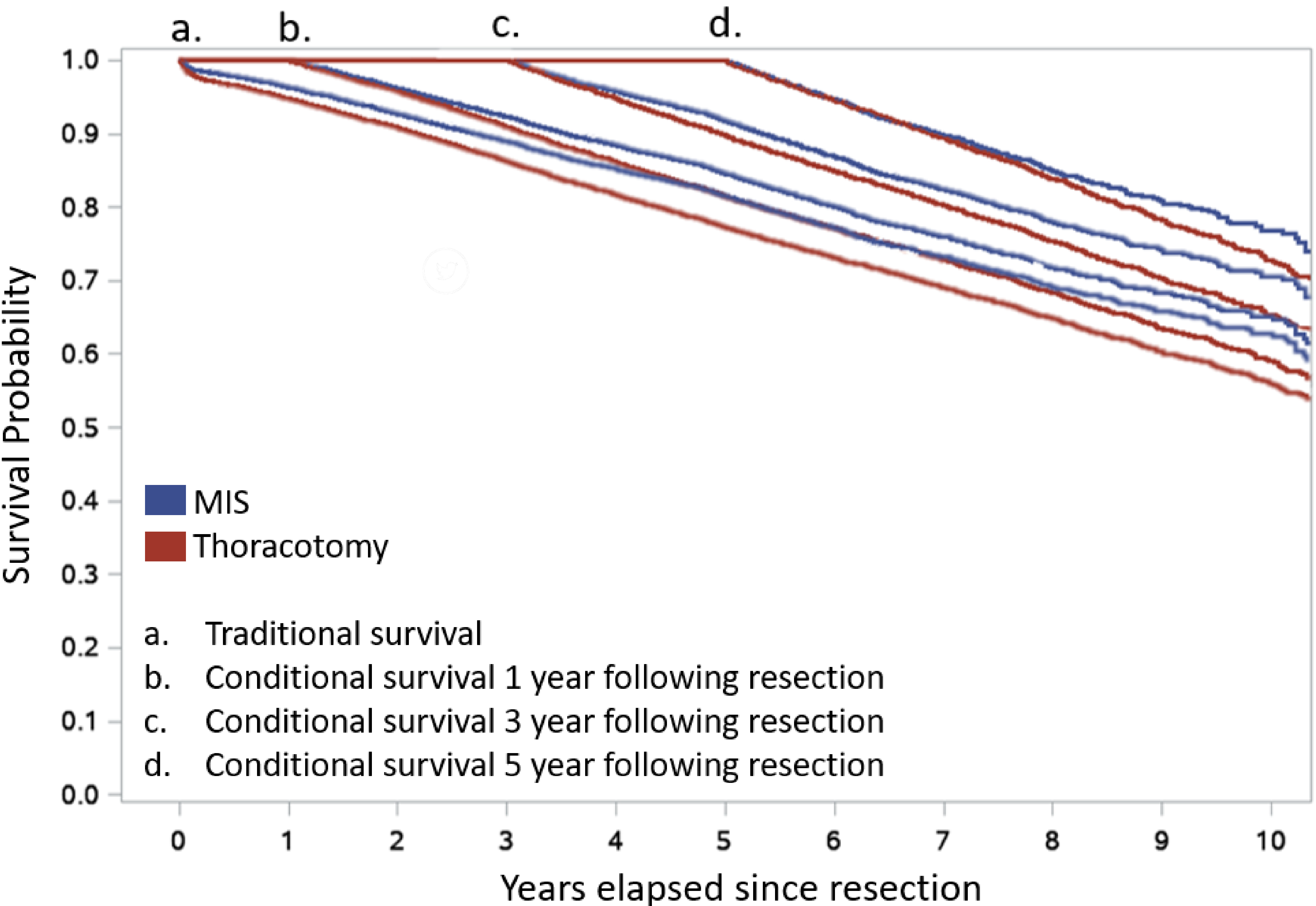


Figure: Kaplan-Meier curves representing survival results at 4 varying timepoints

CONCLUSIONS

- MIS showed survival benefits in TS and the 1 and 2 year CS, suggesting MIS confers a survival advantage over thoracotomy acutely following resection
- However, MIS is not statistically different in the 3, 4, and 5 year CS, suggesting the oncologic survival is similar between the approaches