TIMING OF ADJUVANT THERAPY AND TOTAL HEALTHCARE EXPENDITURES FOLLOWING ROBOTIC-ASSISTED LOBECTOMY OF NON-SMALL CELL LUNG CANCER: A SEER-MEDICARE ANALYSIS

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Gediwon Milky, PhD[1], Tessa Runels, MPH[1], I-Fan Shih, PhD[1], Daniel S. Oh, MD[1,2]
[1]Intuitive Surgical, Inc., Sunnyvale, CA, USA, [2]City of Hope, Los Angeles, CA

OBJECTIVE

Lung cancer remains the leading cause of cancer-related mortality and despite advances in treatment, 5-year overall survival remains less than 30%.[1] Even for stage-I patients treated with surgery, recurrence rates can reach 20% highlighting the need for effective post-operative management.[2]

Robotic-assisted surgery (RAS) for lung cancer resections is increasingly used and associated with faster recovery,[3,4] but its impact on patient readiness for adjuvant systemic therapy and downstream healthcare expenditures remains unclear.

We examined early adjuvant therapy and one-year expenditures following RAS versus Video-Assisted Thoracoscopic (VATS) and Open resections of non-small cell lung cancer (NSCLC).

METHODS

Study Design

- Retrospective cohort study using SEER-Medicare databases 2016 – 2019
- Lobectomy for stage I-III NSCLC
- Subgroup analysis for stage-I patients

Outcomes

- Rate of early-adjuvant therapy (at 6-weeks, at 8-weeks, and at 10-weeks)
- Healthcare expenditures: Total, Medicare, and out-of-pocket (OOP) payments
- Open-conversion, Length of stay (LOS) and All-cause healthcare utilizations: Emergency visits, Readmissions, and Total inpatient days

Analysis

- Comparison Groups: RAS vs. VATS & RAS vs. Open
- Stabilized Inverse-probability of treatment weighting (IPTW)
- Logistic regression & zero-inflated negative binomial regressions after IPTW

RESULTS

- A total of 4,281 patients met eligibility: 893 (21%) RAS, 2,270 (53%) VATS & 1,118 (26%) Open.

RAS vs VATS

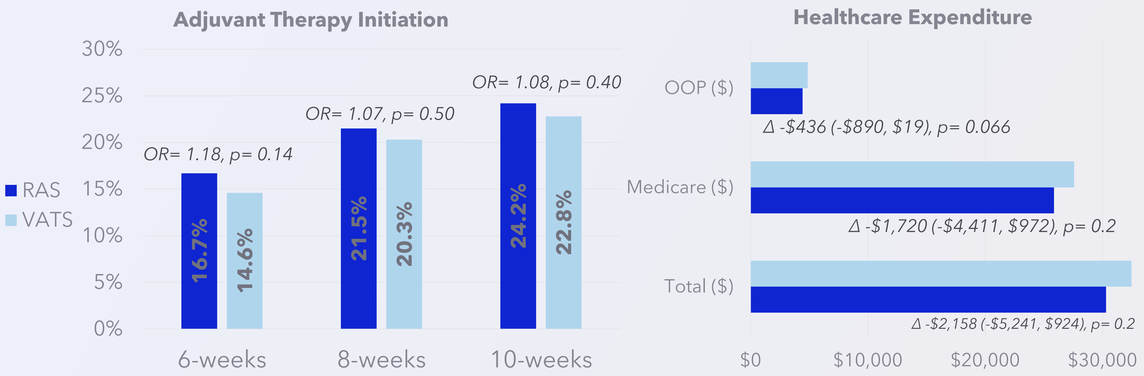

Figure 1. Adjuvant therapy initiation (left) and one-year healthcare expenditure (right): RAS vs VATS comparison

KEY FINDINGS

- RAS versus VATS
  - RAS had higher rate of early-adjuvant therapy among stage I subgroup of patients
  - RAS had similar total healthcare expenditures
  - RAS had fewer open-conversion (OR= 0.65)
- RAS versus open
  - RAS had higher rates of early-adjuvant therapy
  - RAS had lower total healthcare expenditures and fewer all-cause readmissions
  - RAS had shorter index LOS (5.2 vs 6.9 days)

Subgroup: Among stage-I patients, RAS was associated with greater likelihood of starting adjuvant therapy (*at* 8-weeks: 11.4% vs. 8.3%, **OR= 1.42, *p= 0.023*** and *at*10-weeks: 12.9% vs. 9.5%, **OR= 1.41, *p= 0.018***), with no difference in one-year expenditures (mean difference= -$1,137, *p= 0.50*).

Table 1. Index and post-index all-cause healthcare utilizations: IPTW adjusted comparison of RAS and VATS

Outcomes	RAS, weighted n= 852	VATS, weighted n= 2,285	OR/IRR (95% CI)	Mean difference (95%CI)	*p*
Conversion	29 (3.4%)	118 (5.2%)	0.65 (0.43, 0.97)		**0.043**
Index LOS	4.7 (4.53, 4.93)	4.9 (4.82, 5.07)	0.96 (0.91, 1.00)	-0.22 (-0.45, 0.02)	0.075
30-day emergency visit	143 (16.8%)	359 (15.7%)	1.06 (0.87, 1.30)	-	0.50
30-day readmission	122 (14.3%)	353 (15.5%)	0.92 (0.73, 1.14)	-	0.40
1-year Readmission	268 (31.4%)	753 (33.0%)	0.93 (0.79, 1.10)	-	0.40
1-year Total inpatient days	4.4 (3.57, 5.46)	5.5 (4.82, 6.24)	0.81 (0.63, 1.04)	-1.07 (-2.25, 0.11)	0.089

RAS vs Open

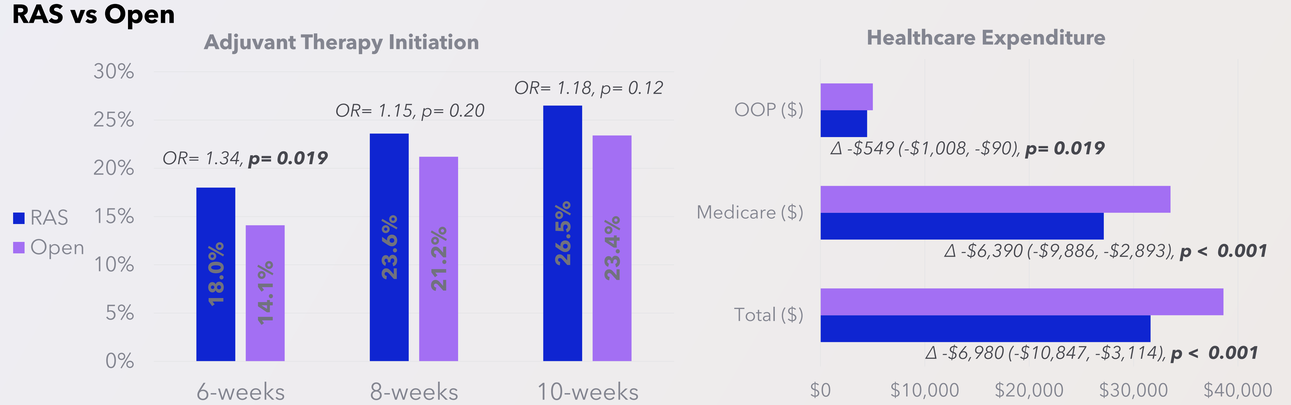

Figure 2. Adjuvant therapy initiation (left) and one-year healthcare expenditures (right): RAS vs Open comparison

Subgroup: Among stage-I patients, RAS was associated with consistently greater likelihood of starting adjuvant therapy (at 6-weeks: **OR= 1.90, *p= 0.004***, at 8-weeks: **OR= 1.57, *p= 0.017*** and at 10-weeks: **OR= 1.69, *p= 0.005***), with no difference in one-year expenditures (mean difference= -$3,132, *p= 0.11*).

Table 2. Index and post-index all-cause healthcare utilizations: IPTW adjusted comparison of RAS and Open

Outcomes	RAS, weighted n= 925	Open, weighted n= 1,033	OR/IRR (95% CI)	Mean difference (95%CI)	*p*
Index LOS	5.2 (4.97, 5.39)	6.9 (6.67, 7.16)	0.75 (0.71, 0.79)	1.74 (1.42, 2.06)	**< .001**
30-day emergency visit	180 (19.5%)	245 (23.7%)	0.84 (0.68, 1.04)	-	0.10
30-day readmission	156 (16.8%)	267 (25.8%)	0.58 (0.46, 0.72)	-	**< .001**
1-year Readmission	304 (32.9%)	417 (40.4%)	0.72 (0.60, 0.87)	-	**< .001**
1-year Total inpatient days	5.8 (4.80, 7.01)	7.4 (6.22, 8.90)	0.78 (0.60, 1.01)	-1.64 (-3.37, 0.08)	0.060

CONCLUSION

Robotic-assisted lobectomy is associated with earlier timing of adjuvant therapy and lower one-year expenditure as compared to Open lobectomy.

As compared to VATS, robotic lobectomy was associated with earlier timing of adjuvant therapy among stage I subgroup of patients, with no difference in expenditures.

Contact:
Gediwon Milky, PhD
gediwon.milky@intusurg.com

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