Controversies in the surgical management of lung cancer

14th Annual

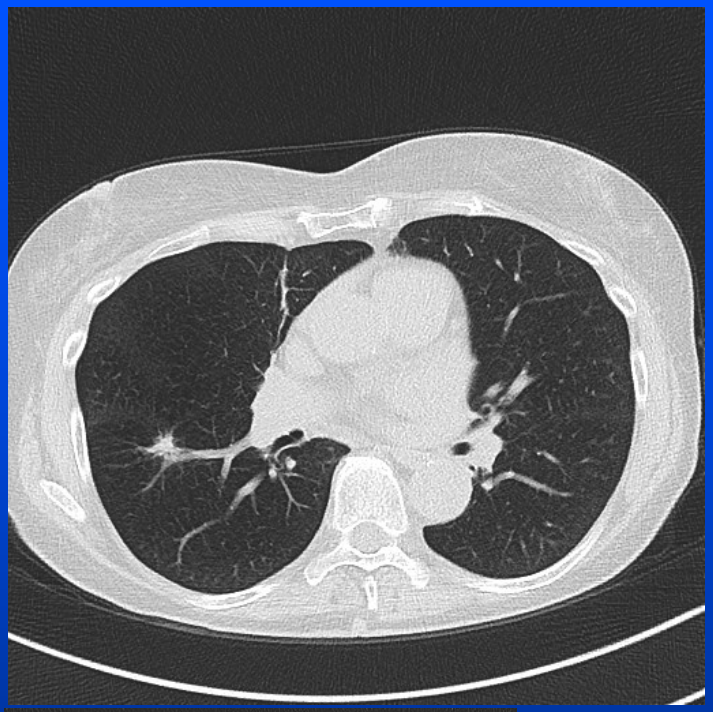
Winter Lung Cancer Conference

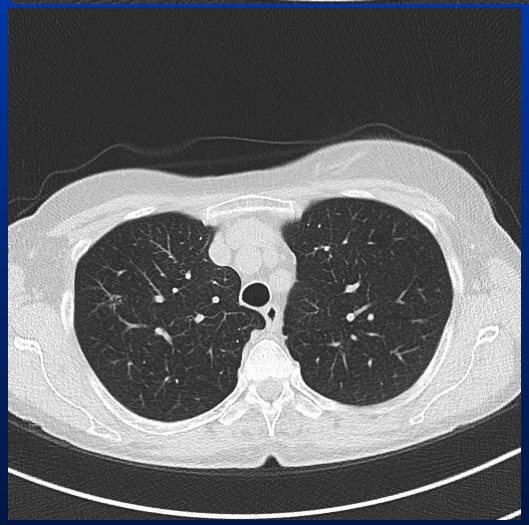
Miami, Feb 12 2017

Eric Vallières MD FRCSC
Medical Director
Division of Thoracic Surgery
Swedish Cancer Institute
Seattle, WA

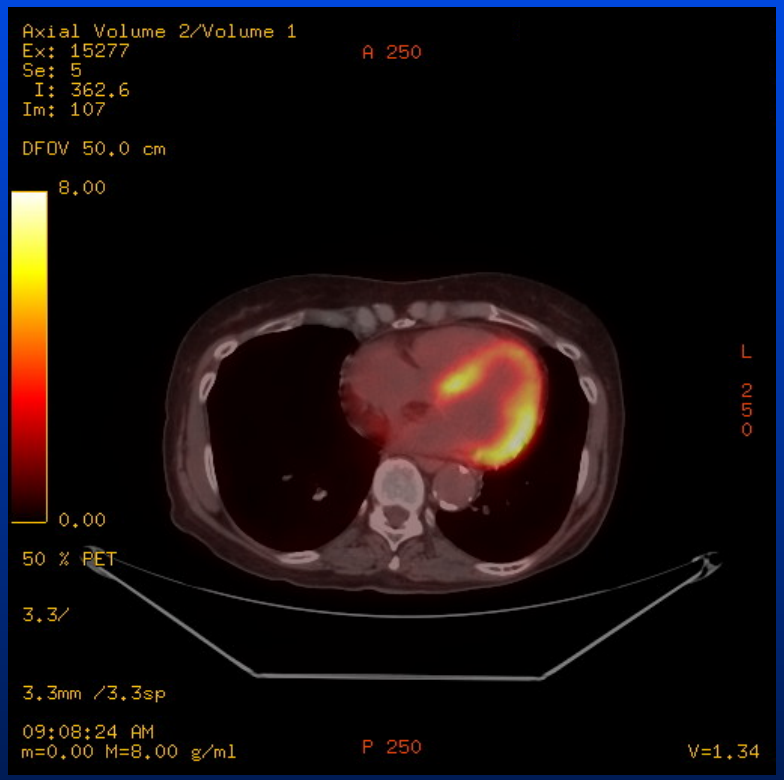
CASE: peripheral adenoca

- 69-year-old F former smoker
- Screening CT chest
- Still working, COPD, no additional major comorbidities,
- FEV1 58%, DCO 65%





Resection for T1 peripheral lesions

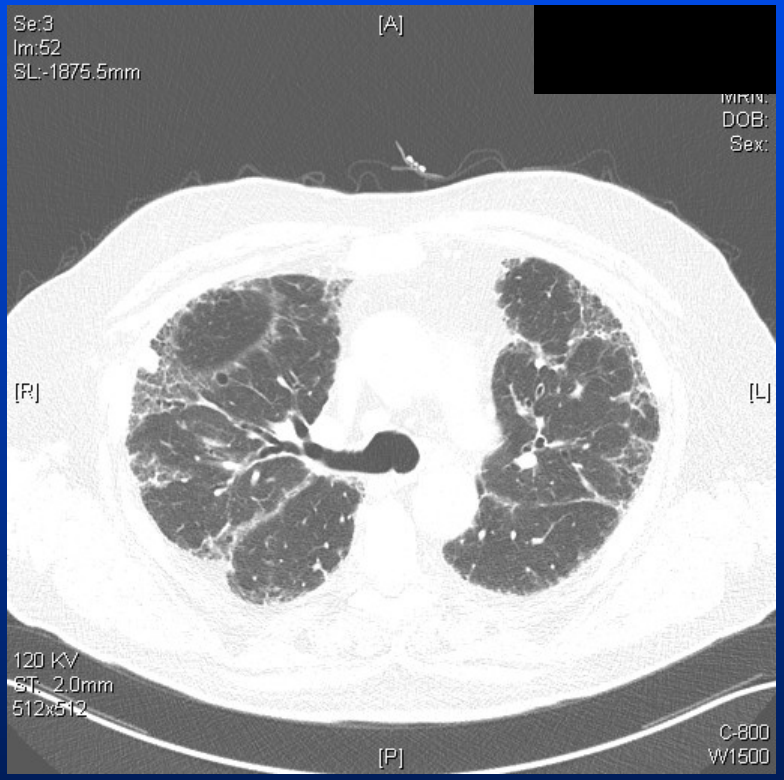


cT1aN0M0 not biopsied
15 mm
Max SUV 0.6
Additional pGGO 15mm RUL

VATS wedge > completion SS RLL, HD 4
pT1aN0M0R0 adenocarcinoma 10mm, acinar predominant invasive adenoca, G2, PL0

CASE: resect or SABR

- 78-year-old M former smoker
- New onset progressive RA, fine crepitants on auscultation
- Chest imaging = pulmonary fibrotic changes and RUL nodule
- Remains active, no limitation
- FEV1 3.14 liters, DCO 60%, RV 50%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Im:52
SL:-1875.5mm
[A]
DOB:
Sex:
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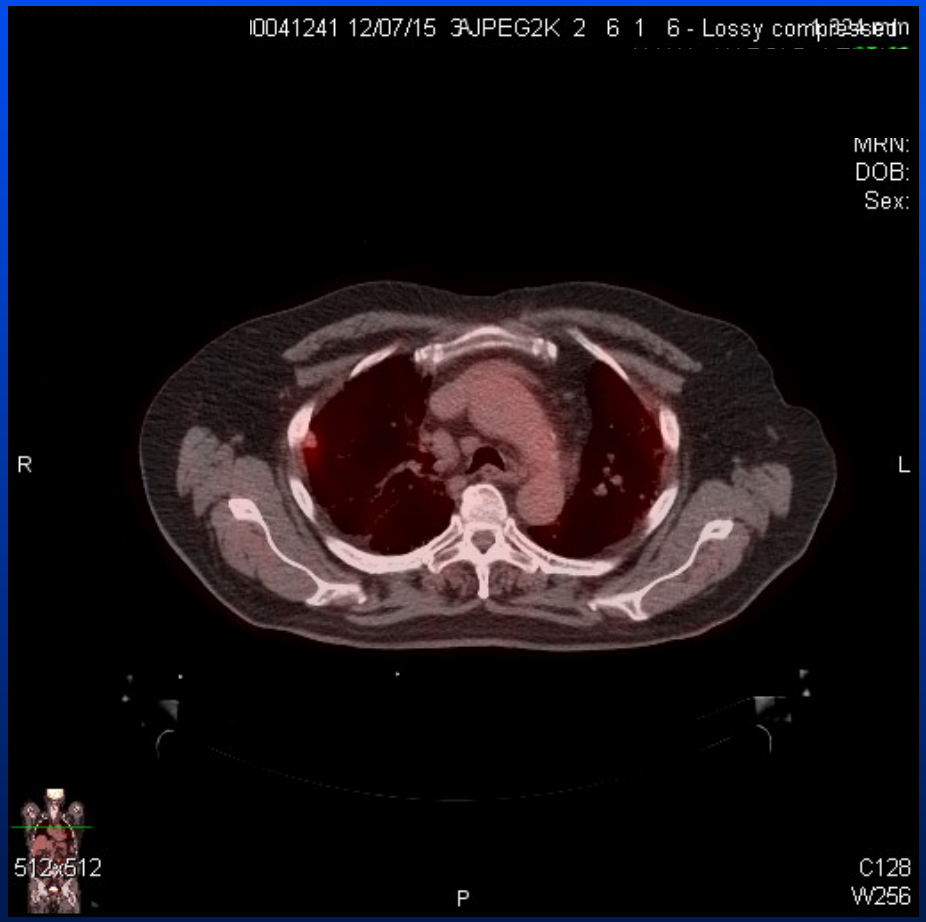
[L]
120 KV
ST: 2.0mm
512x512
[P]
C-800
W1500


MRN:
DOB:
Sex:
R
L
512x512
P
C128
W256

- CT guided bx suspects adenoca
- cT1aN0M0, 14 mm, max SUV 3.5
- Offered him SABR…

- Wire-localized VATS wedge resection
- pT1aNxM0R0 mixed adeno-SCLC (50%)
- 11 mm, G4, PL2, LVI+

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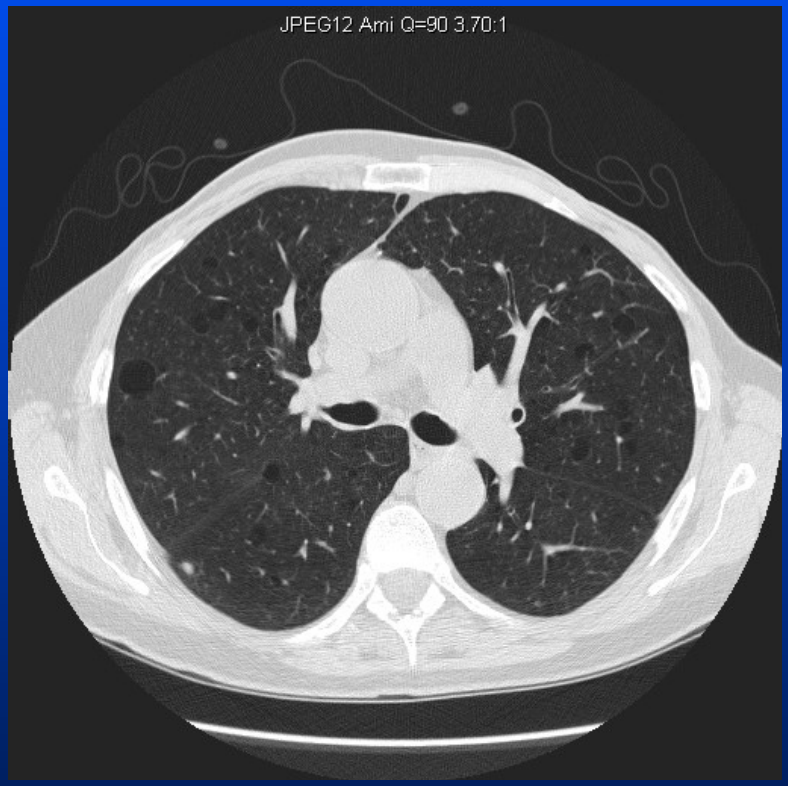
Controversies in the surgical management of lung cancer

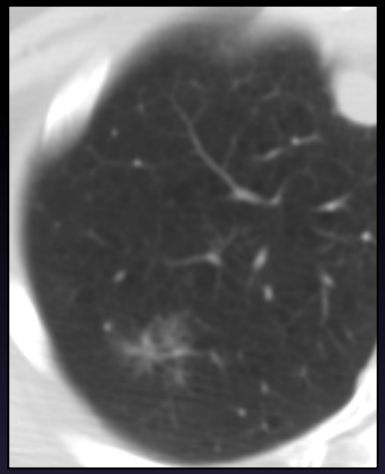
- Lobes or less for peripheral T1aN0 tumors
- Surgery vs SABR for stage I disease
- Open vs VATS vs Robot

Lobes or less for peripheral T1aN0 tumors

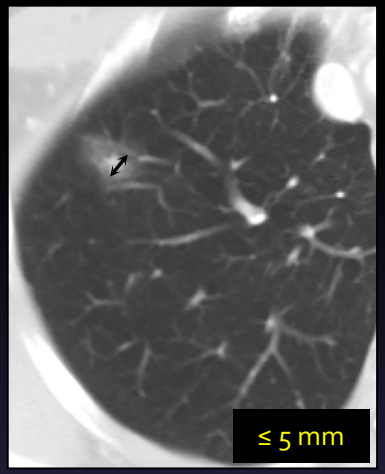


The peripheral adenocarcinoma spectrum

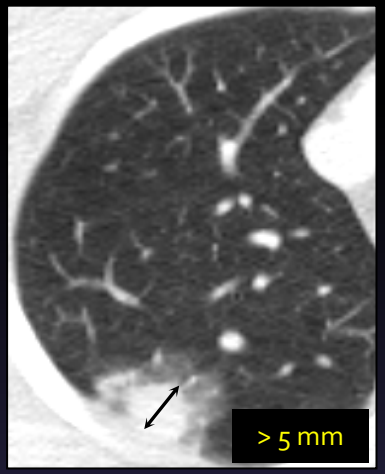
RADIOLOGIC IASLC/ATS/ERS CLASSIFICATION



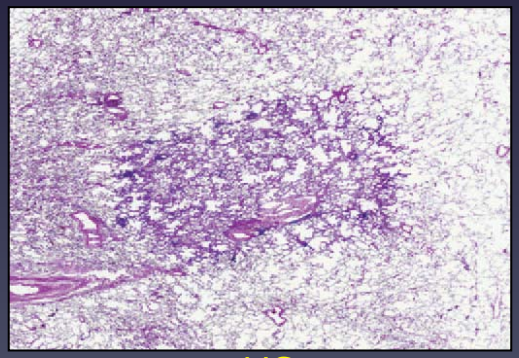
rAIS



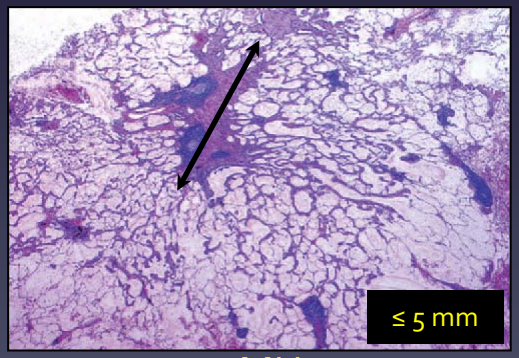
rMIA



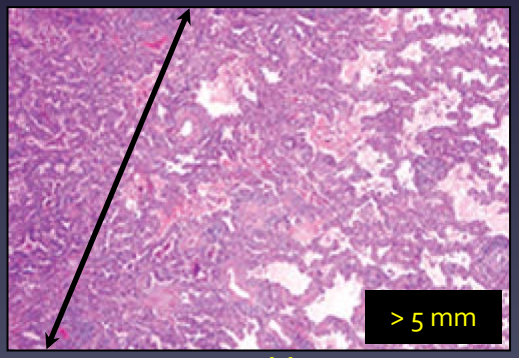
rIA



pAIS



pMIA



pIA

Tumor Shadow Disappearance Ratio

Size 0-20 mm (n=135)

TDR (%)	N	Ly(+)	V(+)	N(+)	5 y (%)
0-25	24	7	6	8	41
26-50	37	7	19	6	88
51-75	31	4	7	0	100
76-100	43	1	2	0	100

Okada M et al: Ann Thorac Surg 76: 1828-32, 2003

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76-100	43	1	2	0	100

Okada M et al: Ann Thorac Surg 76: 1828-32, 2003

Radiologic Evaluation of Small Lepidic Adenocarcinomas to Guide Decision Making in Surgical Resection

Candice L. Wilshire, MD, Brian E. Louie, MD, Kristin A. Manning, MD, Matthew P. Horton, MD, Massimo Castiglioni, MD, Jed A. Gorden, MD, Ralph W. Aye, MD, Alexander S. Farivar, MD, and Eric Vallières, MD

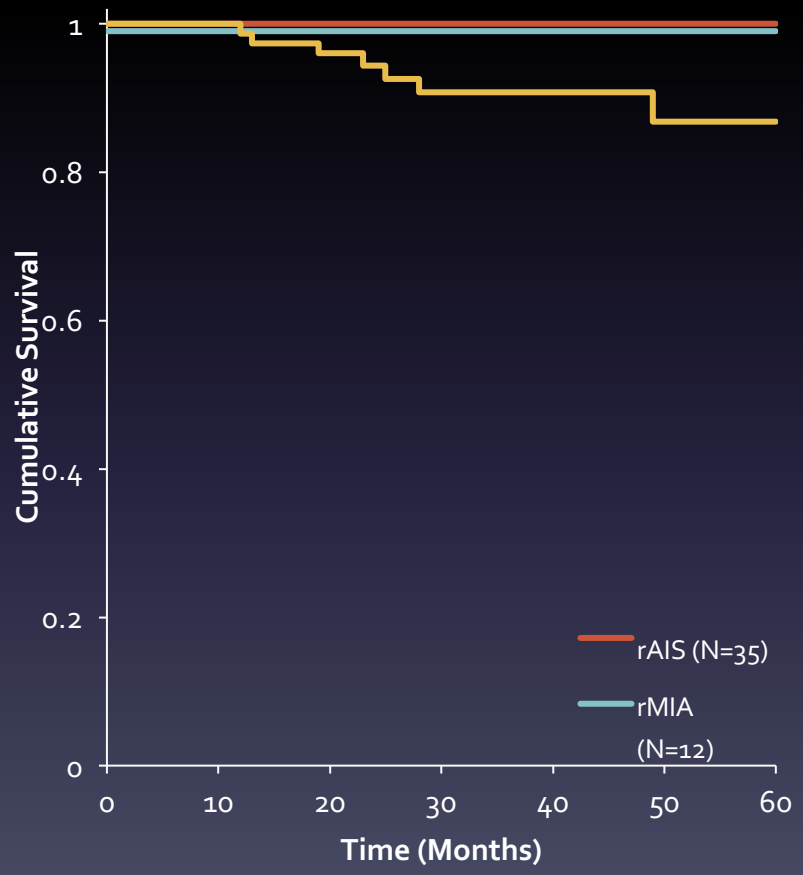
Division of Thoracic Surgery, Swedish Cancer Institute, Seattle; Seattle Radiologists, Seattle; and CellNetix Pathology and Laboratories, Seattle, Washington

(Ann Thorac Surg 2015;100:979–88)

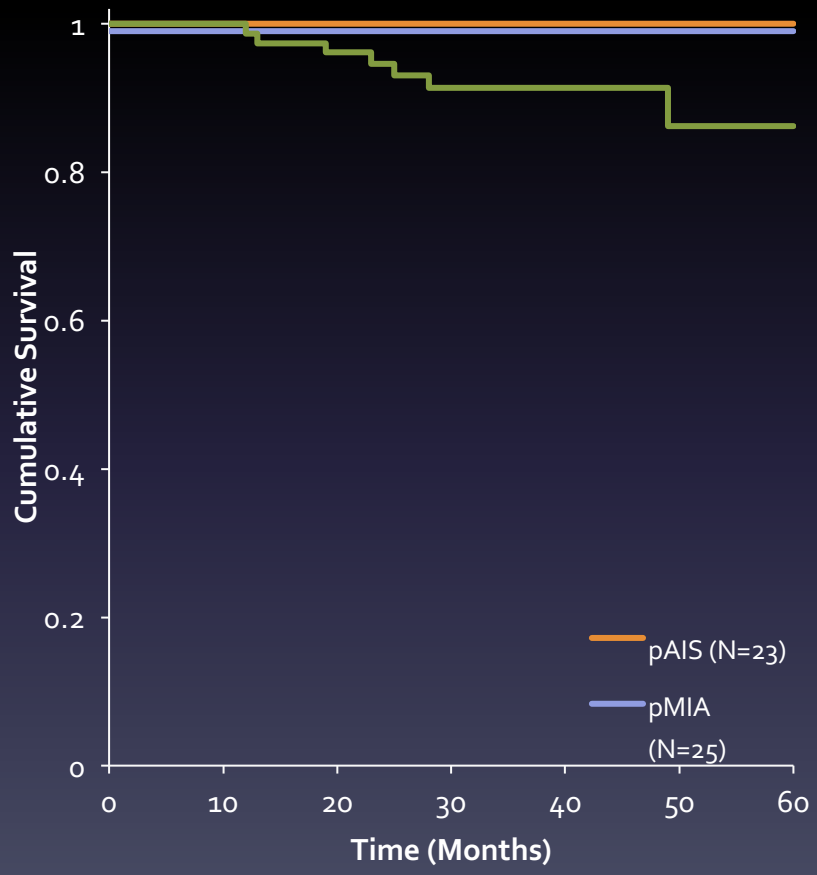
Conclusions. The radiologic classification of patients with lepidic adenocarcinomas is associated with similar oncologic and survival outcomes compared with the pathologic classification and may guide decision making in the approach to surgical resection.

5-YEAR OVERALL SURVIVAL

RADIOLOGIC IASLC/ATS/ERS CLASSIFICATION



PATHOLOGIC IASLC/ATS/ERS CLASSIFICATION

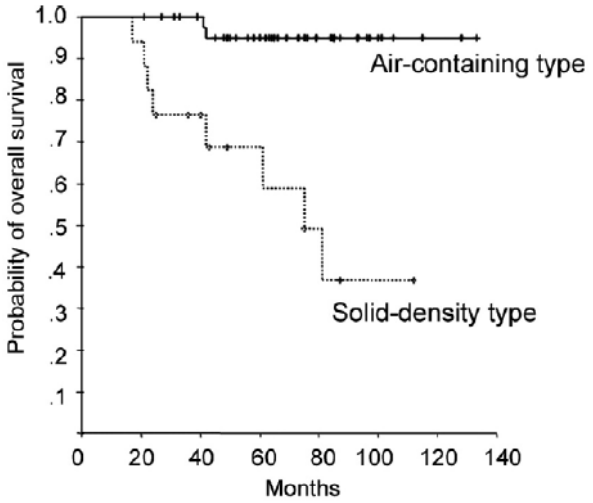


Sublobar Resection for Patients With Peripheral Small Adenocarcinomas of the Lung: Surgical Outcome is Associated With Features on Computed Tomographic Imaging

Haruhiko Nakayama, MD, Kouzo Yamada, MD, Haruhiro Saito, MD, Fumihiro Oshita, MD, Hiroyuki Ito, MD, Yoichi Kameda, MD, and Kazumasa Noda, MD

Divisions of Thoracic Surgery, Thoracic Oncology, and Pathology, Kanagawa Cancer Center, Yokohama, Japan

(Ann Thorac Surg 2007;84:1675–9)

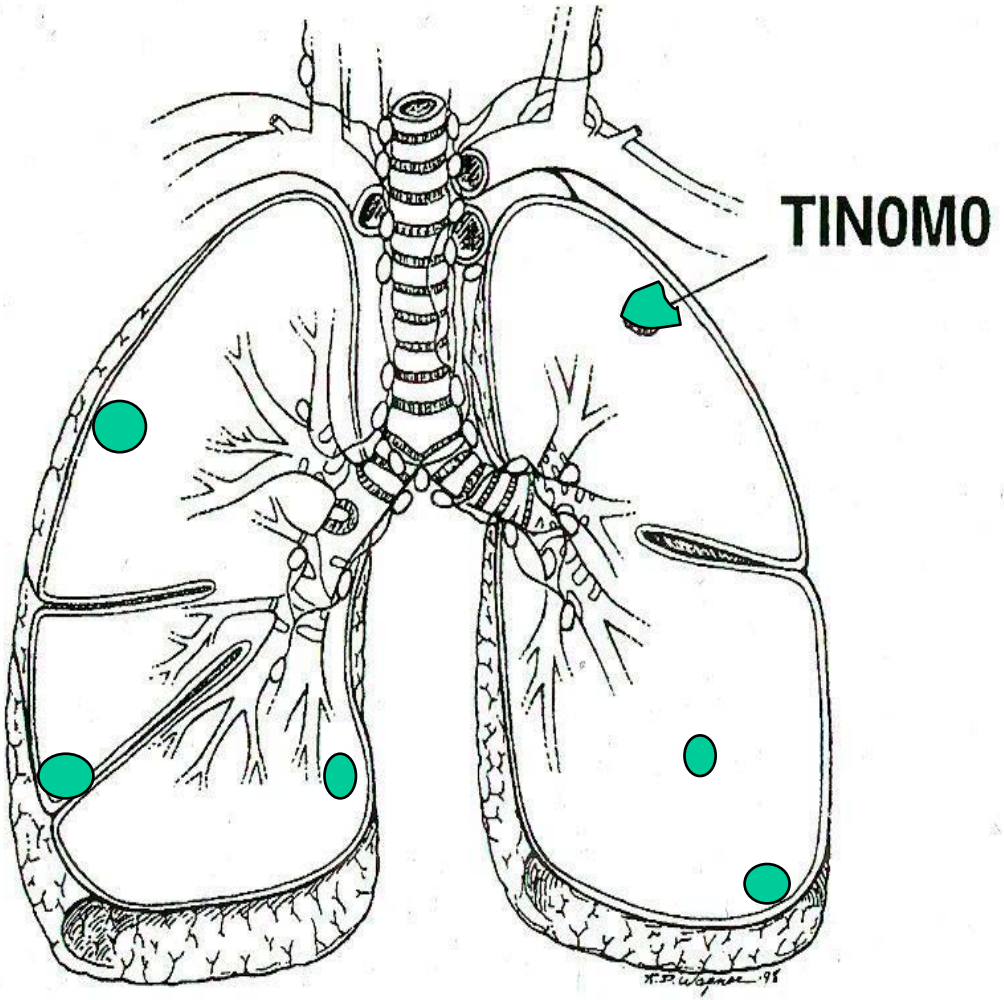


Patients at risk

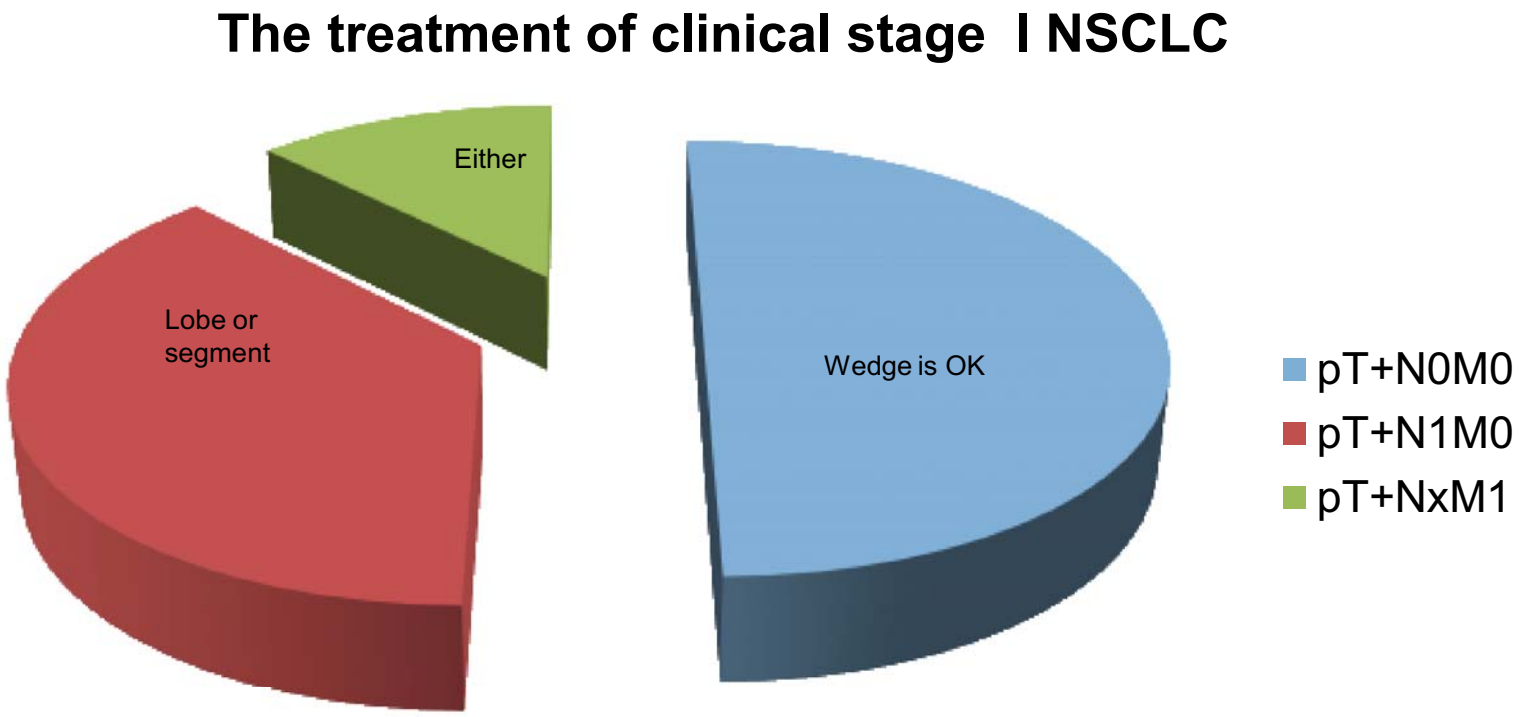
Months	0	12	24	36	48	60
Air-containing type	46	46	45	42	36	30
Solid-density type	17	17	14	12	8	7

Fig 3. Overall survival curve for patients with air-containing type (solid line; n = 46) and solid-density type (dotted line; n = 17) tumors.

Not all wedges are equal… location and size do matter



Wedge resection vs. anatomical resection



Sublobar resections for pT1N0M0

Awaiting the results of completed randomized trials (US and Japan)

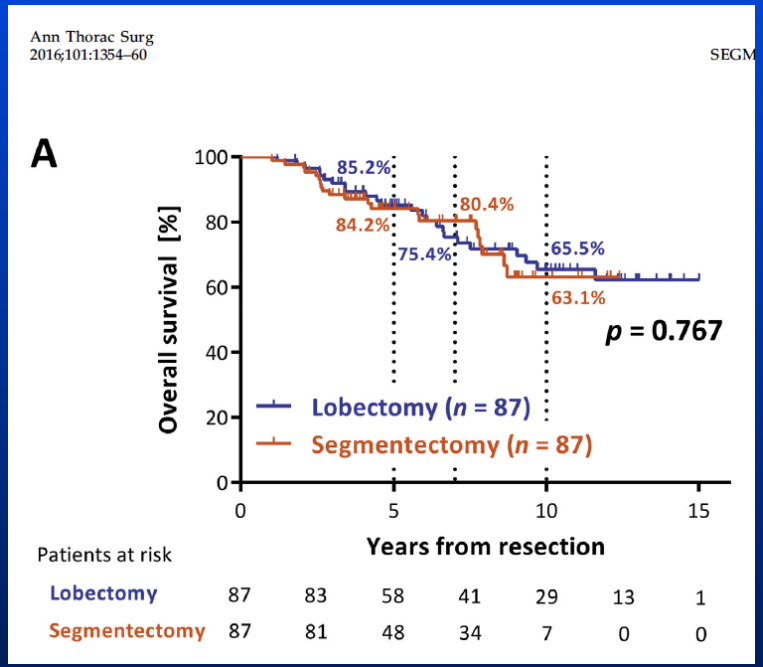
Lobectomy Versus Segmentectomy in Radiologically Pure Solid Small-Sized Non-Small Cell Lung Cancer

Terumoto Koike, MD, PhD, Akihiko Kitahara, MD, Seijiro Sato, MD, PhD, Takehisa Hashimoto, MD, PhD, Tadashi Aoki, MD, PhD, Teruaki Koike, MD, PhD, Katsuo Yoshiya, MD, PhD, Shin-ichi Toyabe, MD, PhD, and Masanori Tsuchida, MD, PhD

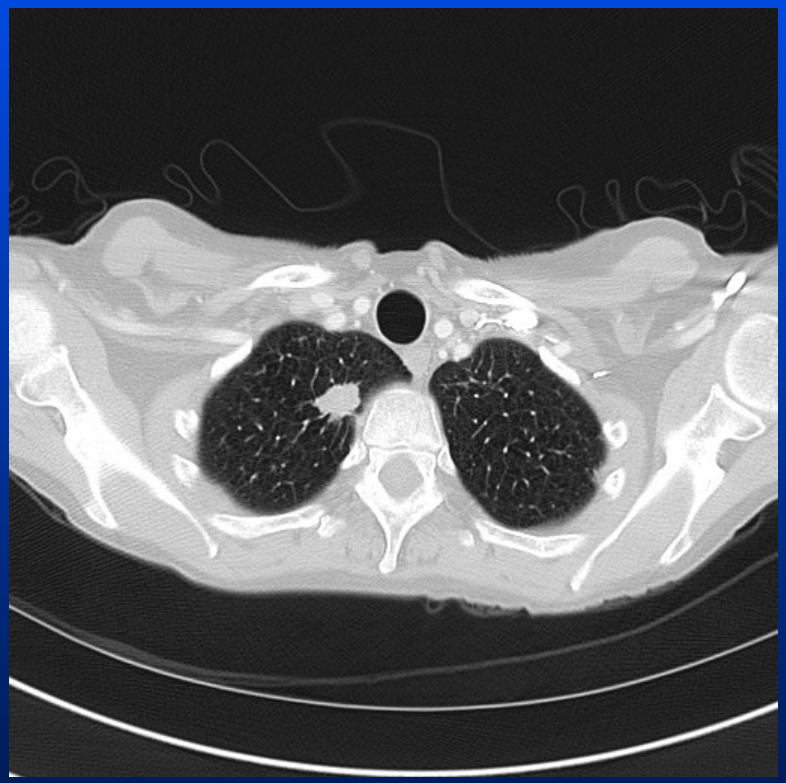
All clinical cT1aN0M0 NSCLC (less than 2 cm in size)

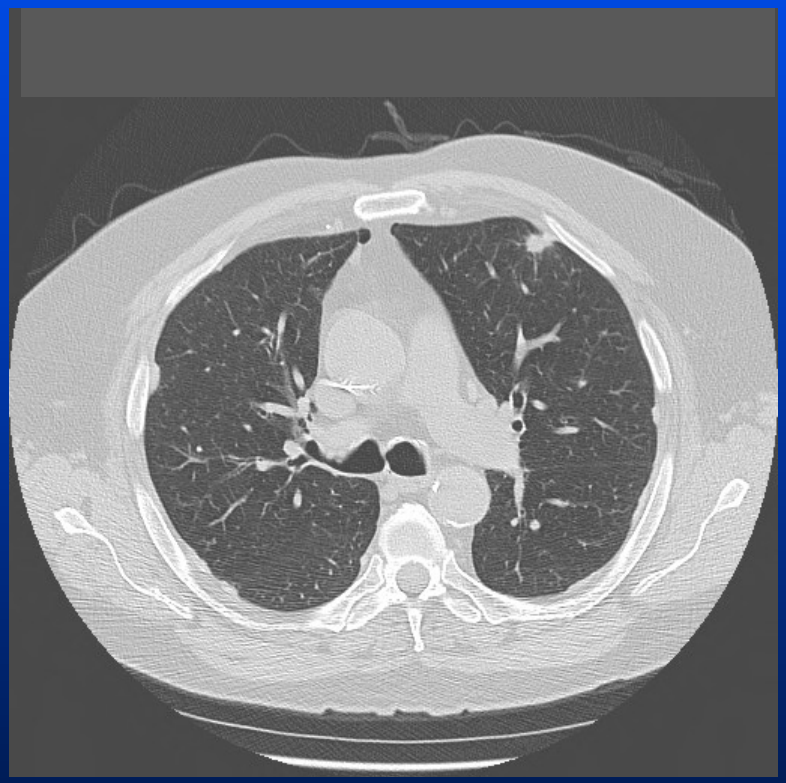
Conclusions. Similar oncologic outcomes after lobectomy and segmentectomy were indicated among patients with radiologically pure solid small-sized NSCLC.

(Ann Thorac Surg 2016;101:1354–60)



Surgery vs SABR for stage I disease



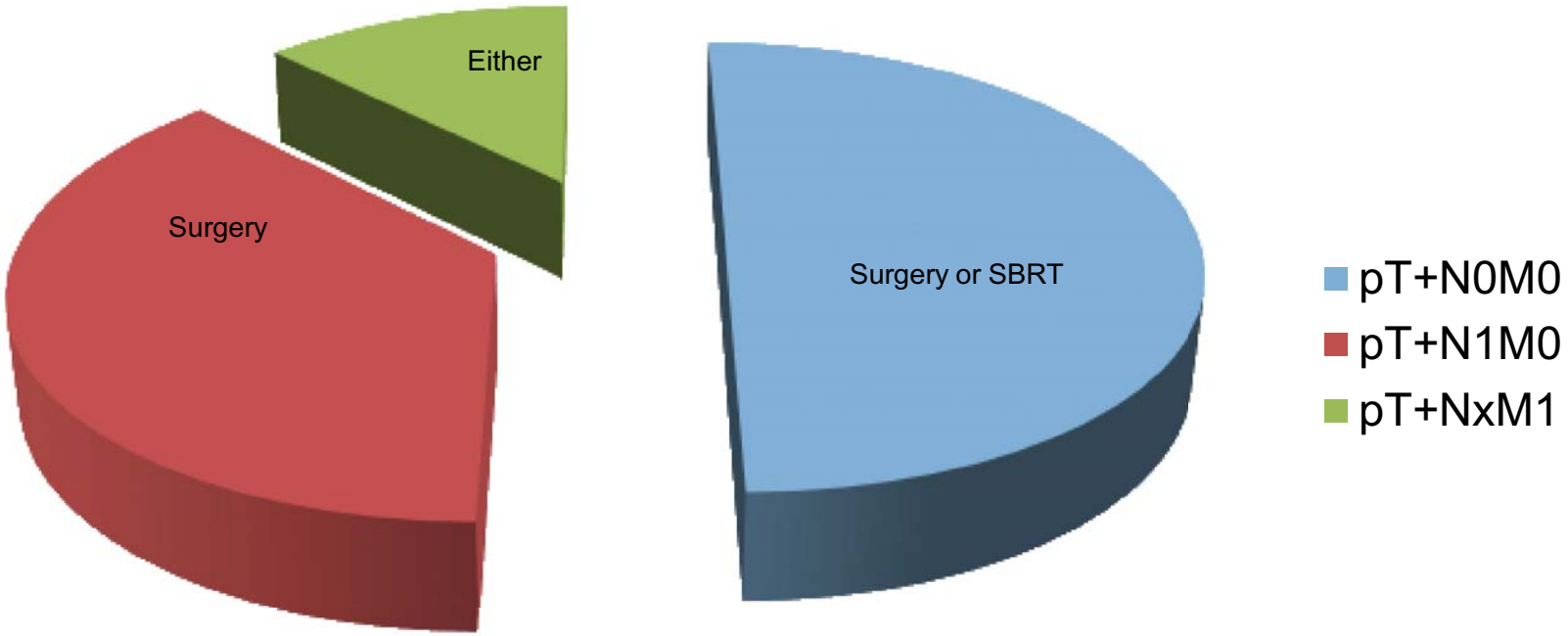


Surgery vs SABR for stage I disease

- Not all wedges are the same… not all SABRs are the same
- Ongoing Stablemate Trial for high risk patients
- Abscopal effect… or simply not enough follow up yet (most published SABR series have only 3 yrs follow up)?
- The argument that surgery allows tissue analysis may not matter down the road…

Surgery vs. SABR

The treatment of clinical stage I NSCLC



Open vs VATS/Uniportal vs Robot

- MIS platforms as is are probably equivalent for the patient
- As long as you replicate exactly the **same** operation you would offer open, MIS is OK!

Comparison of Video-Assisted Thoracoscopic Surgery and Robotic Approaches for Clinical Stage I and Stage II Non-Small Cell Lung Cancer Using The Society of Thoracic Surgeons Database

Brian E. Louie, MD, Jennifer L. Wilson, MD, Sunghee Kim, PhD, Robert J. Cerfolio, MD, Bernard J. Park, MD, Alexander S. Farivar, MD, Eric Vallières, MD, Ralph W. Aye, MD, William R. Burfeind, Jr, MD, and Mark I. Block, MD

Ann Thorac Surg 2016;102:917–24

New Technology and Health Care Costs — The Case of Robot-Assisted Surgery

Gabriel I. Barbash, M.D., M.P.H., and Sherry A. Glied, Ph.D.

Procedures Performed by Robot-Assisted Surgery, Current Cost per Procedure, and Estimates of Change in Cost, as Compared with Standard Procedure.*

Procedure	Mean Cost per Procedure in 2007	Change in Cost		Procedures Performed in the United States in 2007
		Excluding Robot	Including Robot	
		dollars		*no.*
Mainly laparoscopic procedures				
Pyeloplasty	10,065	1,400	3,400	4,823
Nephrectomy	14,943	10,600	NA	45,879
Nissen fundoplication	13,060	600 to 2,100	1,200 to 22,300	17,283
Cholecystectomy	10,366	500	1,700	326,350
Unilateral adrenalectomy	14,707	1,400	2,900	5,387
Rectopexy	9,040	NA	700	1,603
Splenectomy	28,205	3,000	3,200	14,530
Gastric bypass	21,275	NA	2,900	13,782
Thymectomy	17,983	NA	2,400	362
Laparoscopic hysterectomy	8,951	2,500	NA	14,101
Mainly open surgical procedures				
Radical prostatectomy	11,352	2,200	400 to 4,800	79,875
Radical cystectomy	32,388	0	1,600	8,570
Myomectomy	6,721	NA	3,200	32,616
Sacrocolpopexy	7,328	5,500	NA	4,557
Non-laparoscopic hysterectomy	7,328	NA	NA	279,871
Salpingostomy	5,607	1,400	NA	2,370
Nissen fundoplication	31,333	−1,200	0	6,128
Low colon–rectum anterior resection	16,688	1,600	NA	17,942
Esophagectomy	39,622	NA	2,700	119
Lung lobectomy	23,021	3,900	NA	6,642
Mitral-valve repair	45,914	600	3,700	14,191
Atrial septal defect closure	36,767	1,000	4,000	2,284

N ENGL J MED 363;8 NEJM.ORG AUGUST 19, 2010

The costs of what we do matters…

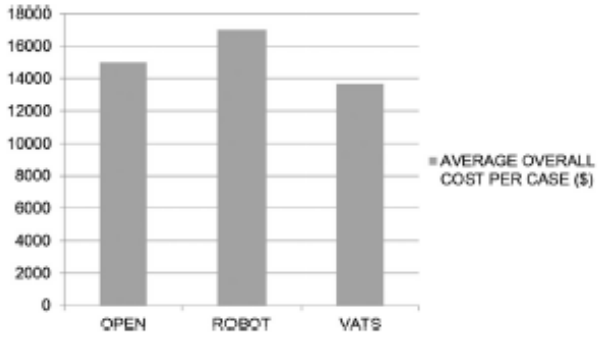


Fig 2. Overall cost per case comparison: open versus robot ($p = 0.058$), open versus video-assisted thoracoscopic (VATS [$p = 0.227$]), and robot versus VATS ($p < 0.001$).

Defining the Cost of Care for Lobectomy and Segmentectomy: A Comparison of Open, Video-Assisted Thoracoscopic, and Robotic Approaches

Shaun A. Deen, MD, Jennifer L. Wilson, MD, Candice L. Wilshire, MD, Eric Vallières, MD, Alexander S. Farivar, MD, Ralph W. Aye, MD, Robson E. Ely, MBA, and Brian E. Louie, MD

Division of Thoracic Surgery and Clinical Transformation Department, Swedish Medical Center and Cancer Institute, Seattle, Washington

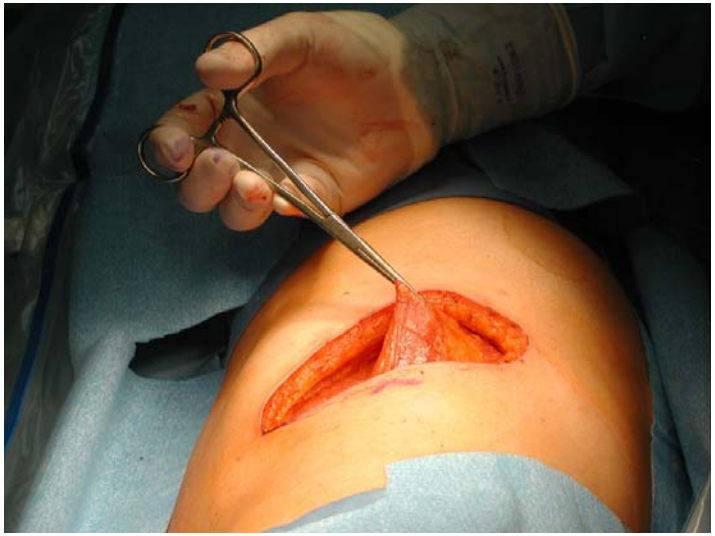
(Ann Thorac Surg 2014;97:1000–7

Table 3. Comparison of Key Clinical Outcomes

Clinical Outcome	Open	Robot	VATS	Open vs Robot *p* Value	Open vs VATS *p* Value	Robot vs VATS *p* Value
Inpatient stay, days	5.47	4.62	4.75	0.054	0.11	0.777
Complication rate, %	30	32	31	0.890	0.942	0.950
OR time, minutes	180	223	202	<0.001	0.02	0.045
Additional procedures, %	41	42	28	0.863	0.125	0.102

OR = operating room; VATS = video-assisted thoracoscopic.

Open surgery in 2017 is not what I was taught…



Conclusions:

Personalized surgical decision making

Lobes or less for peripheral T1aN0 tumors

Surgery vs SABR for stage I disease

Open vs VATS vs Robot

- In my opinion, all of these options have their indications … and limitation.

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Cases for Winter Lung 2017

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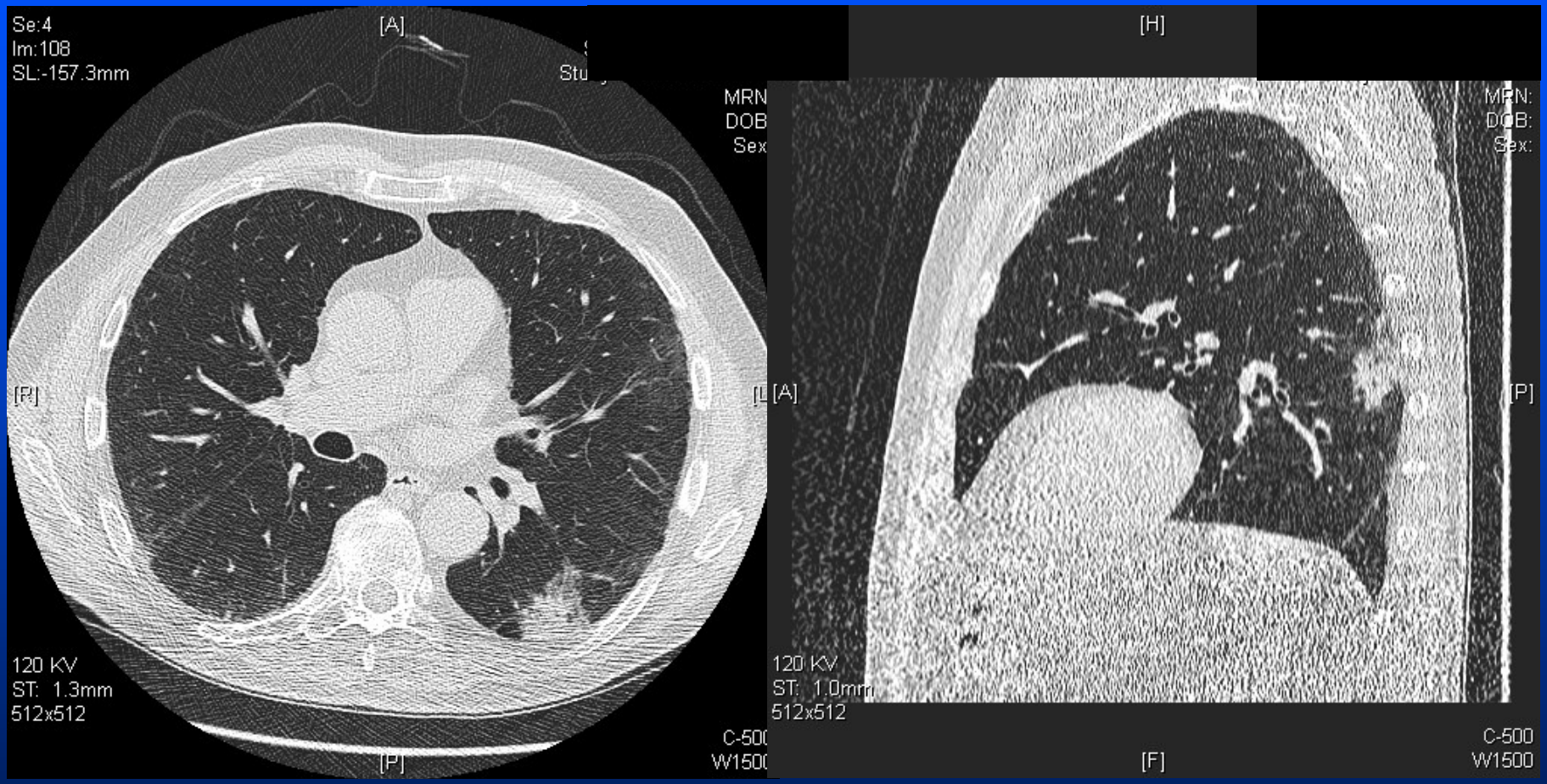
Medical Director
Division of Thoracic Surgery
Swedish Cancer Institute
Seattle, WA

CASE I: AC OR NOT

- 73-year-old M former smoker
- Screening CT chest
- Excellent CP reserves (FEV1 90%/84 DCO 84%)
- No significant co-morbidities


Se:4
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SL:-157.3mm
[A]
MRN
DOB
Sex
[R]
[L
120 KV
ST: 1.3mm
512x512
[P]
C-500
W150
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MRN:
DOB:
Sex:
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120 KV
ST: 1.0mm
512x512
C-500
W1500
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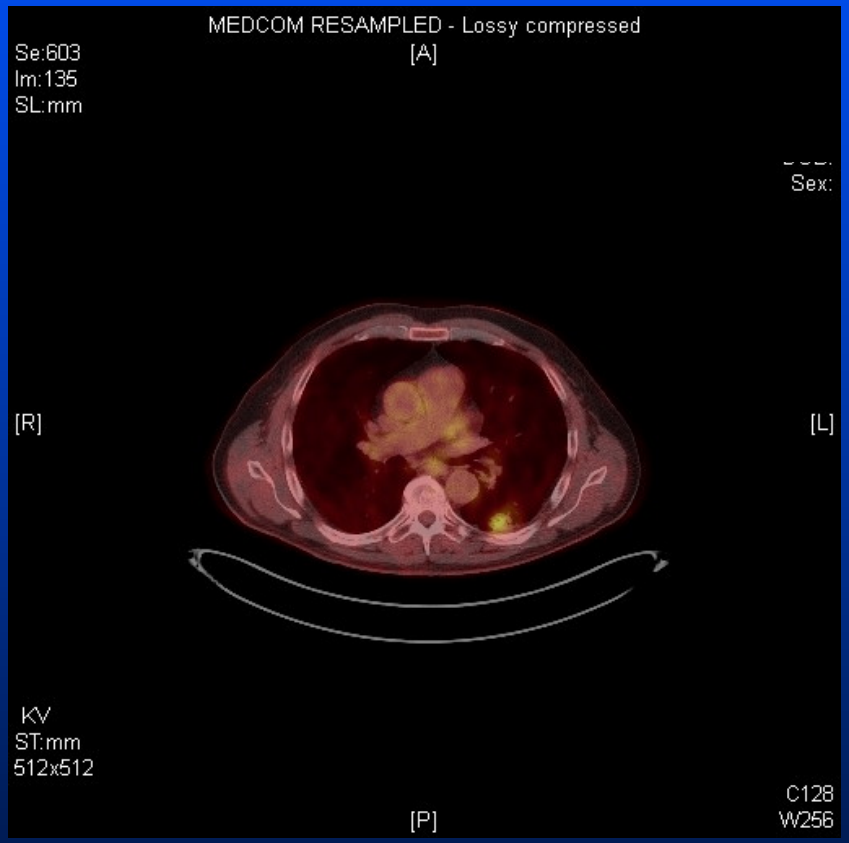


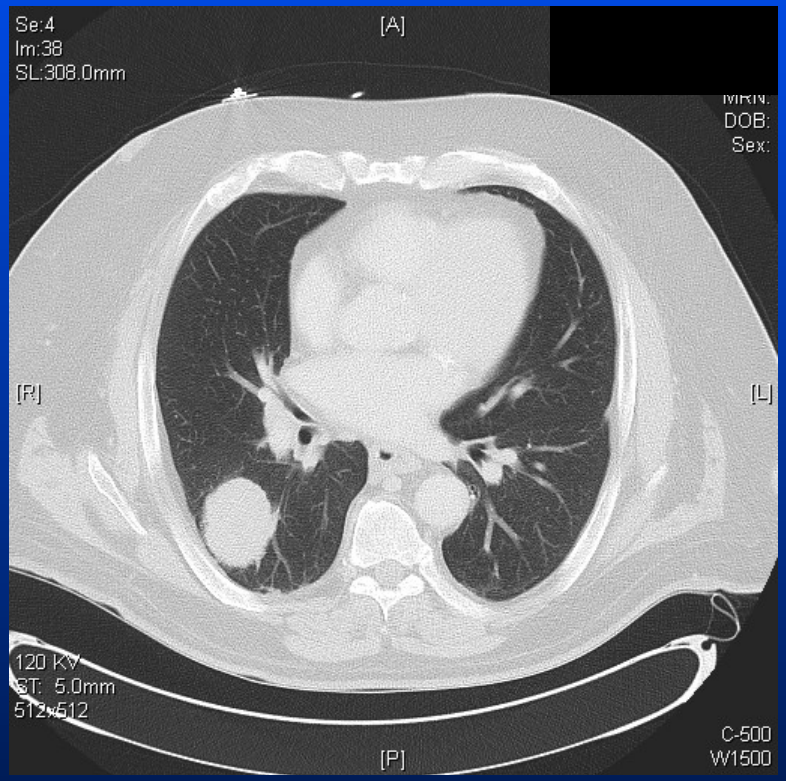
cT2aN0M0 adenocarcinoma
37 mm
Max SUV 3.8

Uneventful med/VATS LLL, HD 3
pT2aN0M0R0 adenocarcinoma
37 mm, G2, LVI+

AC or not?

CASE 2: adjuvant TKIs?

- 65-year-old M never smoker
- Abdominal pain > imaging = RLL mass
- Significant comorbidities: CAD, a fib, IDDM, related CKD 3, DM related neuropathy, sedentary
- New onset clubbing
- FEV1 79%, DCO 60%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DOB:
Sex:
[R]
[L]
120 KV
ST: 5.0mm
512x512
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C-500
W1500


MEDCOM RESAMPLED
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SL:mm
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Sex:
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ST: 3.0mm
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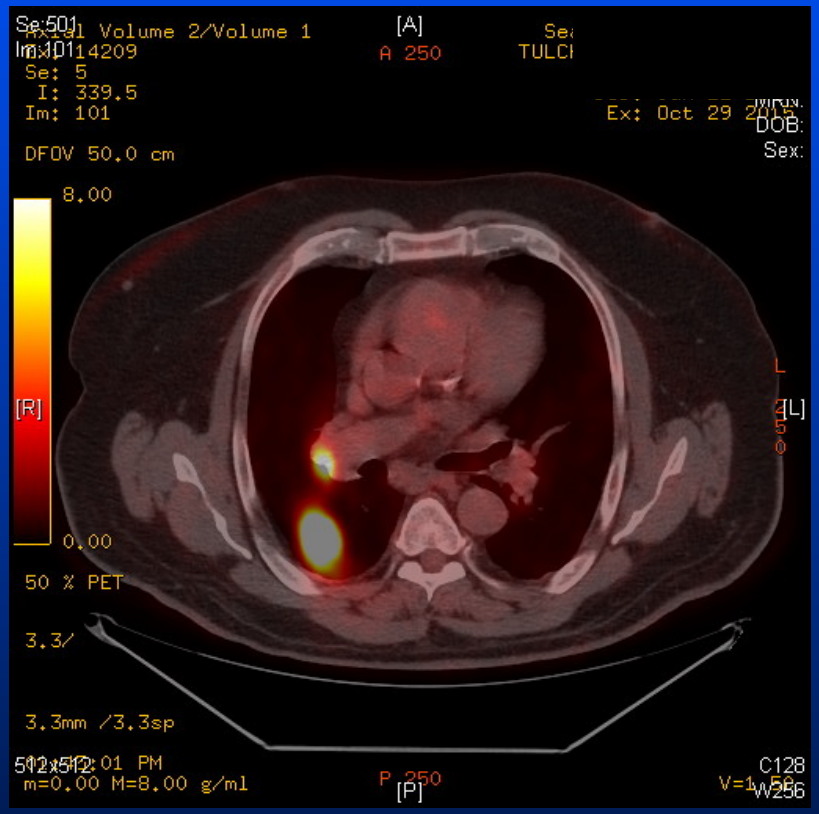
W1465

Adjuvant EGFR TKIs?

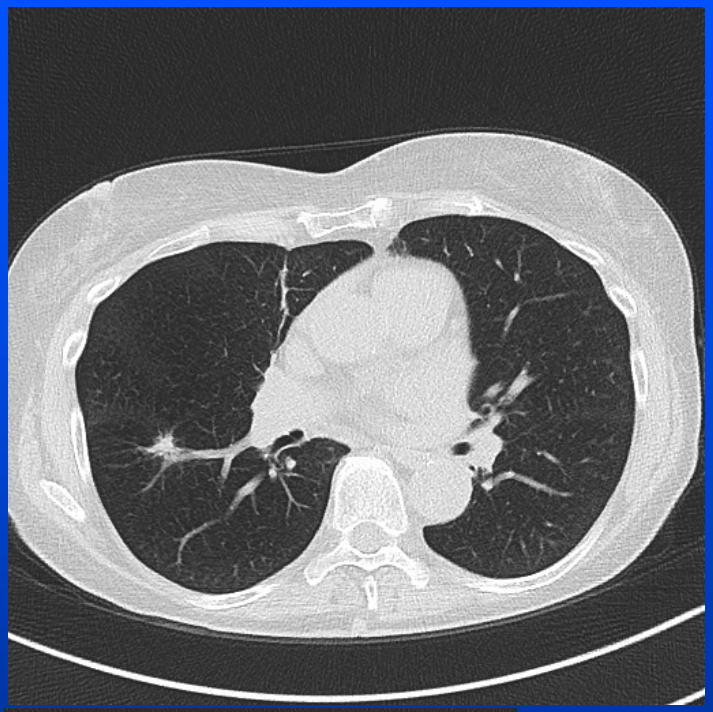


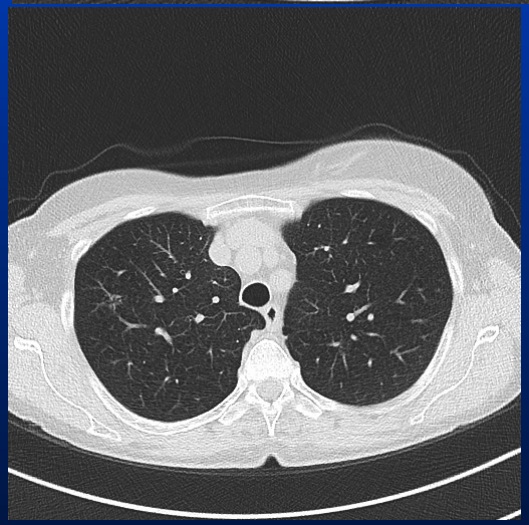
cT2aN1M0 adenocarcinoma
50 mm
Max SUV T 50 N1 9.4

Radical med/ open RLL, HD 5
pT2aN1M0R0 adenocarcinoma
50 mm, G3, 6/21 N1 LN +
Favorable EGFR mutation…

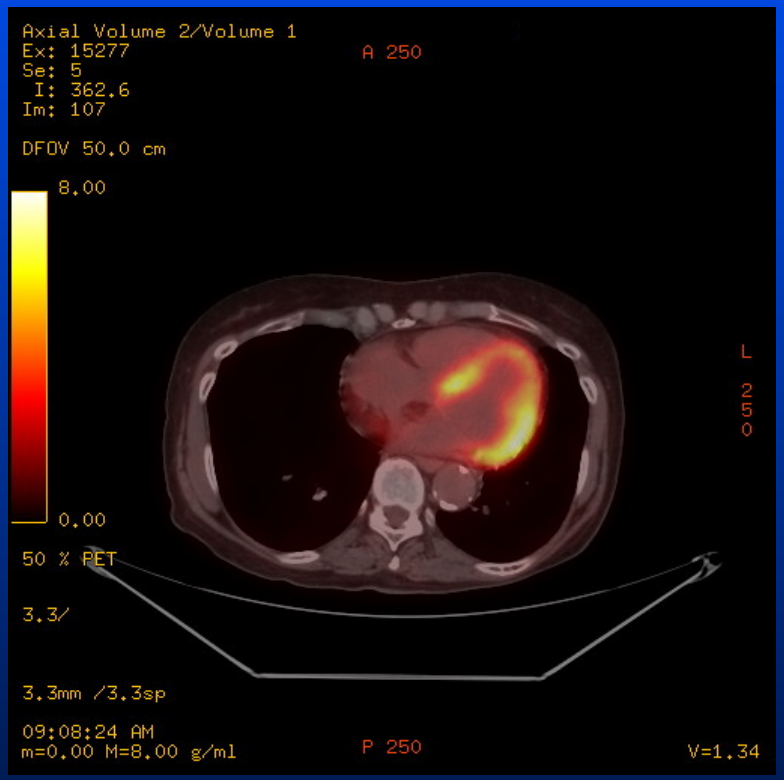
CASE 3: peripheral adenoca

- 69-year-old F former smoker
- Screening CT chest
- Still working, COPD, no additional major comorbidities,
- FEV1 58%, DCO 65%





Resection for T1 peripheral lesions

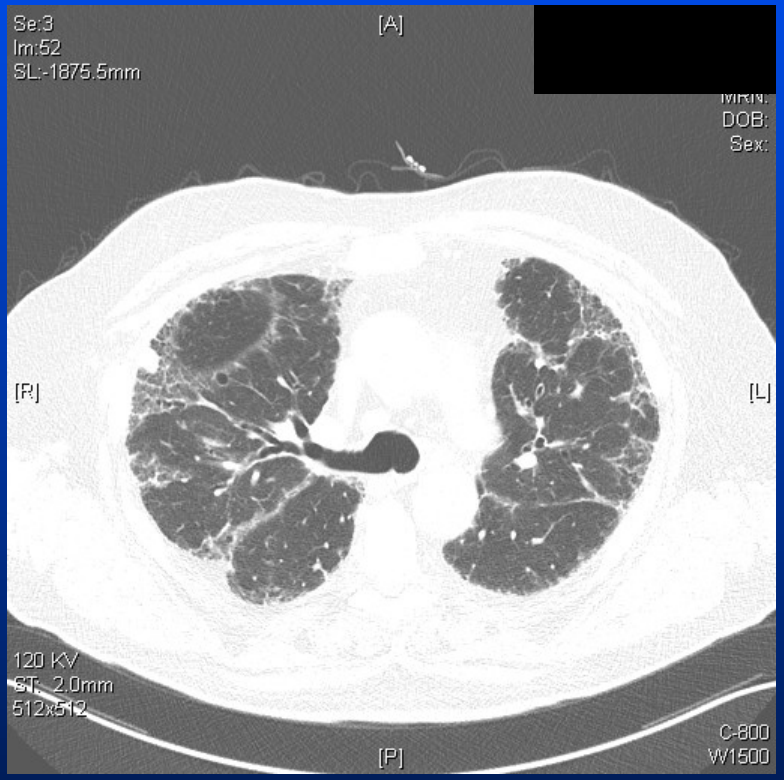


cT1aN0M0 not biopsied
15 mm
Max SUV 0.6
Additional pGGO 15mm RUL

VATS wedge > completion SS RLL, HD 4
pT1aN0M0R0 adenocarcinoma 10mm, acinar predominant invasive adenoca, G2, PL0

CASE 4: resect or SABR

- 78-year-old M former smoker
- New onset progressive RA, fine crepitants on auscultation
- Chest imaging = pulmonary fibrotic changes and RUL nodule
- Remains active, no limitation
- FEV1 3.14 liters, DCO 60%, RV 50%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DOB:
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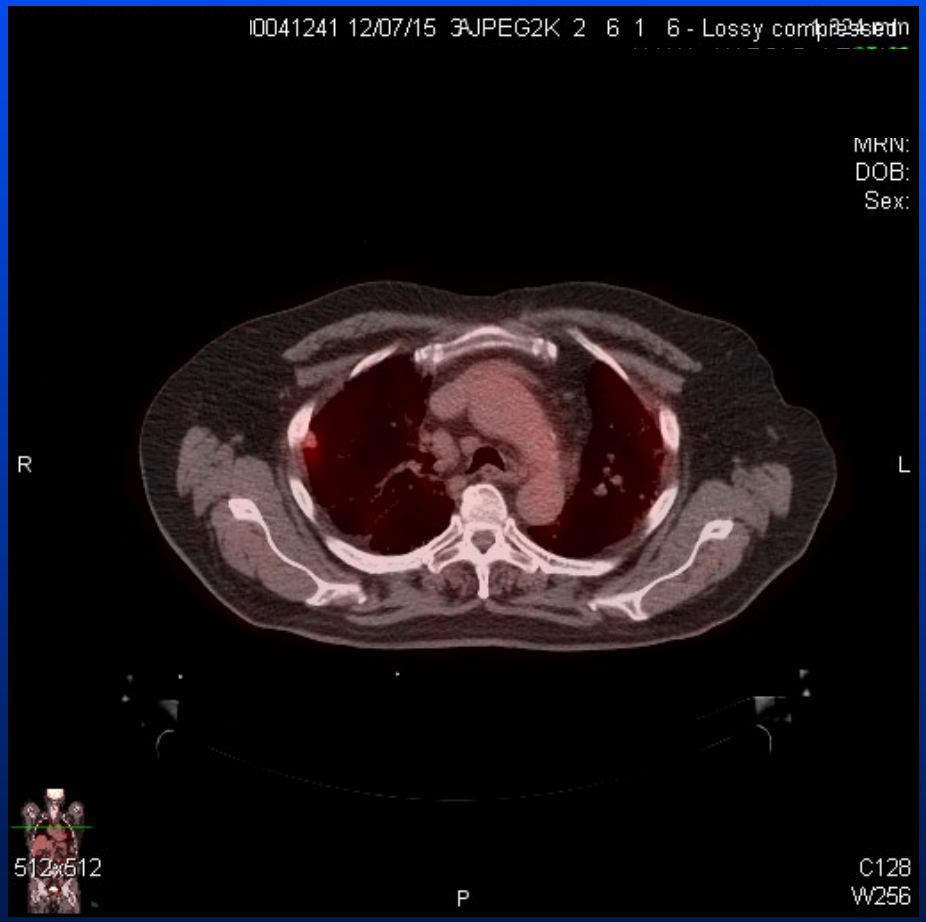
[L]
120 KV
ST: 2.0mm
512x512
[P]
C-800
W1500


MRN:
DOB:
Sex:
R
L
512x512
P
C128
W256

- CT guided bx suspects adenoca
- cT1aN0M0, 14 mm, max SUV 3.5
- Offered him SABR…

- Wire-localized VATS wedge resection
- pT1aNxM0R0 mixed adeno-SCLC (50%)
- 11 mm, G4, PL2, LVI+