TAKD
Türk Akciğer Kanseri Derneği - 2003

Önleyebiliriz... doğrular için birşeyler yap

Dernek | Kurullar | Toplantılar | Yayınlar | Linkler | İletişim

Üyeler

Toplantılar

Yayınlar

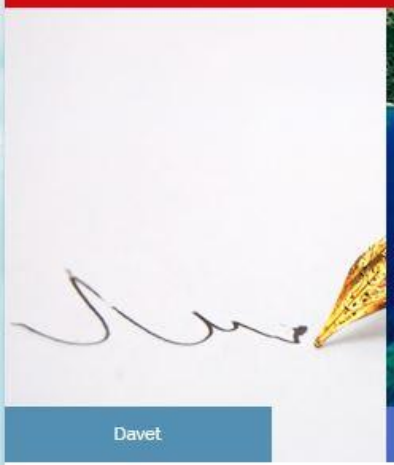
İletişim

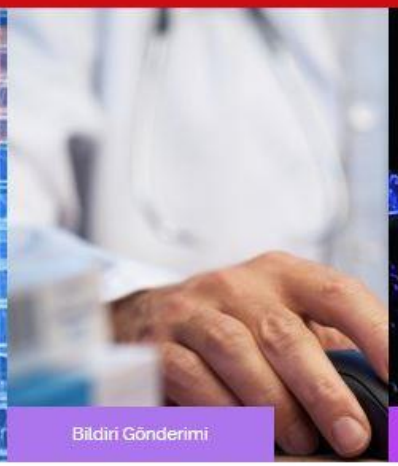
VIII. Ulusal Akciğer Kanseri Kongresi

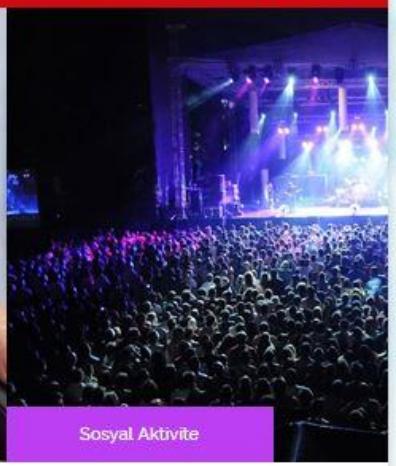
4 - 7 Ekim 2018 Hilton Bodrum, Türkbükü

TAKD
TÜRK AKCİĞER KANSERİ DERNEĞİ 2003
www.takd.org.tr

Türk Göğüs Cerrahisi Derneği
1998







ANASAYFA DAVET KURULLAR BİLDİRİ GÖNDERİM KAYIT KONAKLAMA BİLİMSEL PROGRAM SOSYAL PROGRAM GENEL BİLGİLER İLETİŞİM

Educational

Surgical Skills

The strategy for surgical treatment of IIIA –N2 non-small cell lung cancer

International Association for the Study of Lung Cancer

October 17, 2017

Joe B. Putnam, Jr., MD, FACS
Medical Director
Baptist MD Anderson Cancer Center
Jacksonville, Florida

BAPTIST MD Anderson Cancer Center
Making Cancer History®

MD Anderson Cancer Center
Making Cancer History®

Stage IIIA is heterogeneous

Subset classification:

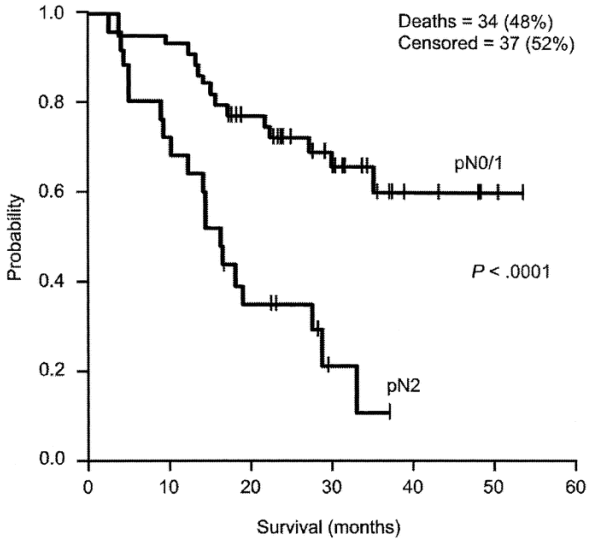
- $IIIA_1$ “Surprise” N2 found after resection (microscopic)
- $IIIA_2$ Single station N2 found at thoracotomy
- $IIIA_3$ N2 found during preoperative staging
  - » Single station
  - » Multiple (ipsilateral)
- $IIIA_4$ Bulky/fixed N2 disease

Robinson LA, et al. Chest 2003; 123:202S-220S

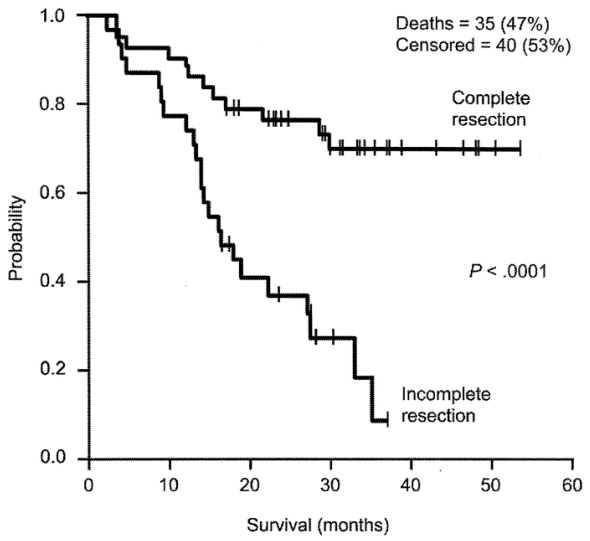
BAPTIST MD Anderson Cancer Center
Making Cancer History®

Mediastinal down-staging & complete resection (R0) needed for best survival

Betticher DC et al. J Clin Oncol. 2003: 21:1752-9; Brit J Cancer 2006: 94:1099-1106



Mediastinal downstaging (N0–1 v N2)



Complete vs incomplete resection

86 pts; 3 cycles cisplatin+docetaxel; CME (+) N2; mediastinal LN downstaging provided 61% 3 year survival vs. 11% for persistent N2.

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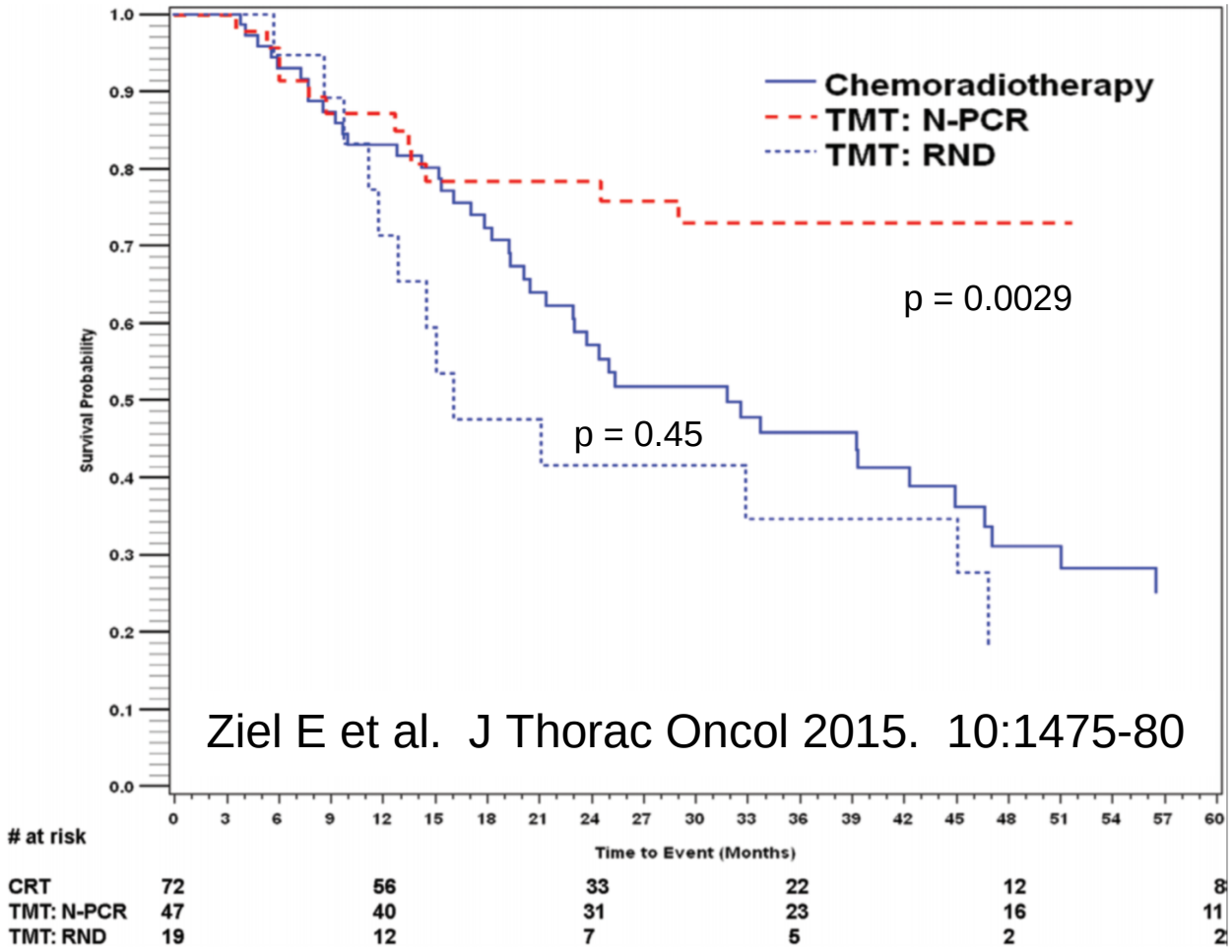
Nodal pathological complete response has best survival after C+RT→S



Ziel E et al. J Thorac Oncol 2015. 10:1475-80

FIGURE 1. Overall survival as a function of treatment and nodal response. TMT, trimodality therapy; N-PCR, nodal pathologic complete response; RND, residual nodal disease.

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Multiple treatment options for IIIA-N2 NSCLC

- C→S
- C→acc RT → S
- C + RT
- C → RT
- C+RT →S
- C → C+RT → S

From Eberhardt WE Lancet 2015. 386: 1018-1019; https://www.nccn.org/professionals/physician_gls/pdf/nscl.pdf

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Multiple treatment options for IIIA-N2 NSCLC

- C → S
- C → acc RT → S
- C+RT
- C → RT
- C + RT →S
- C → C+RT → S

} - Better pCR rates: 25 – 30% in some series
- More likely to achieve R0 resection
- Optimizes each treatment modality

From Eberhardt WE Lancet 2015. 386: 1018-1019; https://www.nccn.org/professionals/physician_gls/pdf/nscl.pdf

Conclusions

- Stage IIIA - N2 NSCLC is complex and heterogeneous
- Selected cIIIA-N2 patient likely to benefit from resection
- Multidisciplinary *treatment planning* is required
- Accurate staging – pretreatment, after induction, and intraoperative – is necessary
- Benefits of resection + induction therapy must exceed the benefits expected of induction therapy alone.

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Potential future clinical trials for surgically resectable stage IIIA N2 NSCLC

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Making Cancer History®

1. Phase II: Surgery for single station N2 followed by chemotherapy

- FDG PET avidity uptake in at least one mediastinal nodal station
- Single station N2 by surgical staging

EXCLUSION

- Multi-station (≥ 2) mediastinal lymph node involvement
- Bulky mediastinal disease

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2. Phase III: C+RT vs. C+RT -> lobectomy

- Prospective randomized trial comparing definitive C+RT vs. C+RT →S (lobectomy) for cStage IIIA (N2) resectable by lobectomy.
  - "Cross-over" to resection after progression with C+RT

- EXCLUSION: Patients who require or are likely to require pneumonectomy

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3. Phase II: Induction with biologicals

- cStage IIIA – N2 / Resectable

Induction for patient with PDL1 expression; or genetic ‘targets’

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Superior Sulcus Non Small Cell Lung Cancers
"Pancoast tumors"

Valerie W. Rusch, M.D.
Attending Thoracic Surgeon and Member
Miner Family Chair in Intrathoracic Cancers
Vice Chair for Clinical Research, Dept. of Surgery
Memorial Sloan-Kettering Cancer Center

SWOG 9416 (INT 0160) Schema

T3-4, N0-1, M0 NSCLC of the superior sulcus

(n = 110)

↓

2 cycles cisplatin + etoposide

RT (45 Gy,5 weeks)

↓

Repeat Extent of Disease Evaluation

N = 102 (92%)

↓

CR, PR or Stable

↓

Surgical Resection

N=83 (75%)

Rusch et al. *JCO* 2007;25:313-318.

SWOG 9416 (INT 0160):
Surgical Resection Data

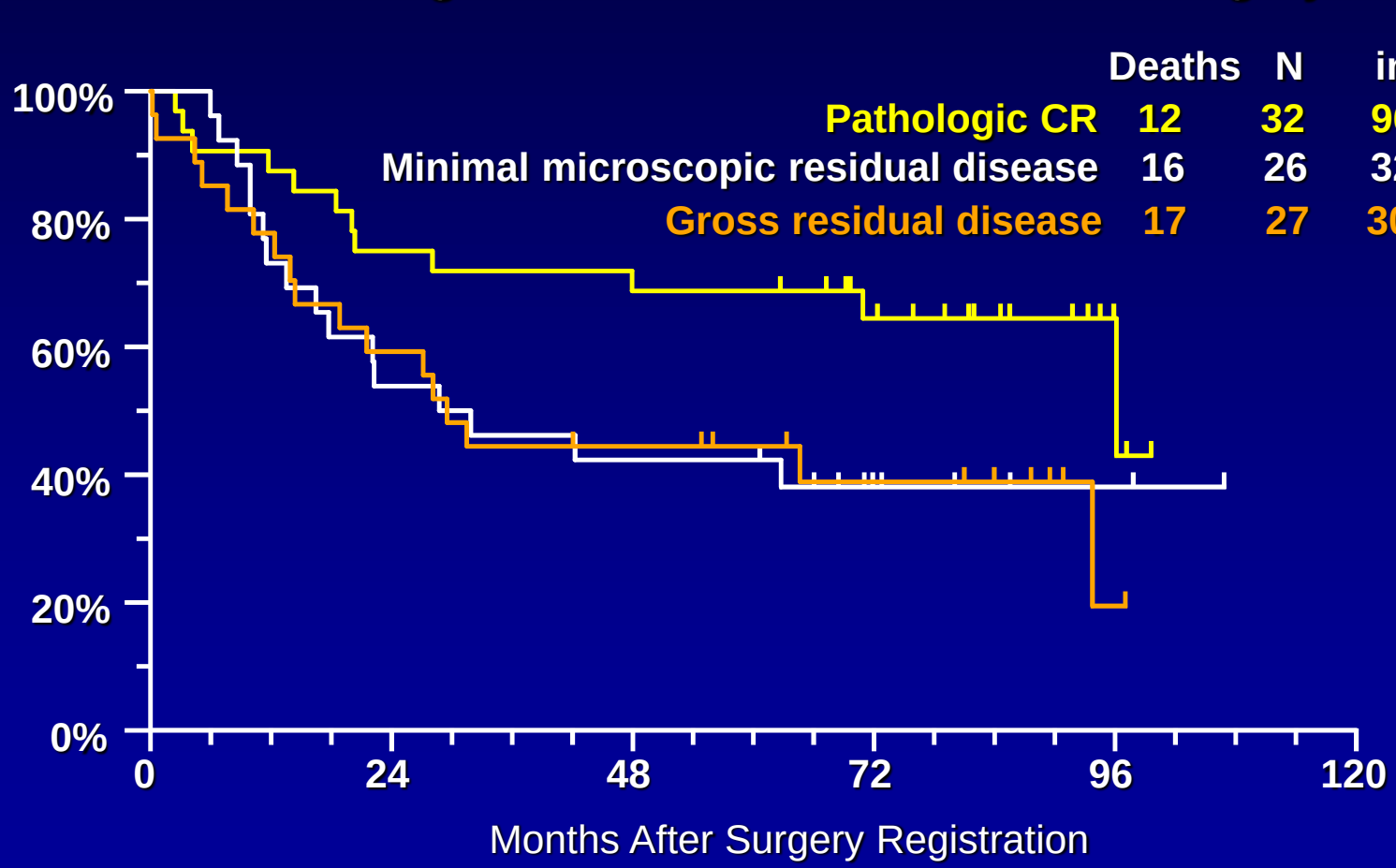
Completeness of Resection	*No. Pts.*	*% All Pts*
Surgically complete (R0, R1)	76	91.6
T3	55/60	92.0
T4	21/23	91.0
Pathologically complete (R0)	75	90.4
T3	55/60	91.3
T4	20/23	87.0

Rusch et al. *JCO* 2007;25:313-318.

Southwest Oncology Group Study S9416

Overall Survival by Pathologic Response

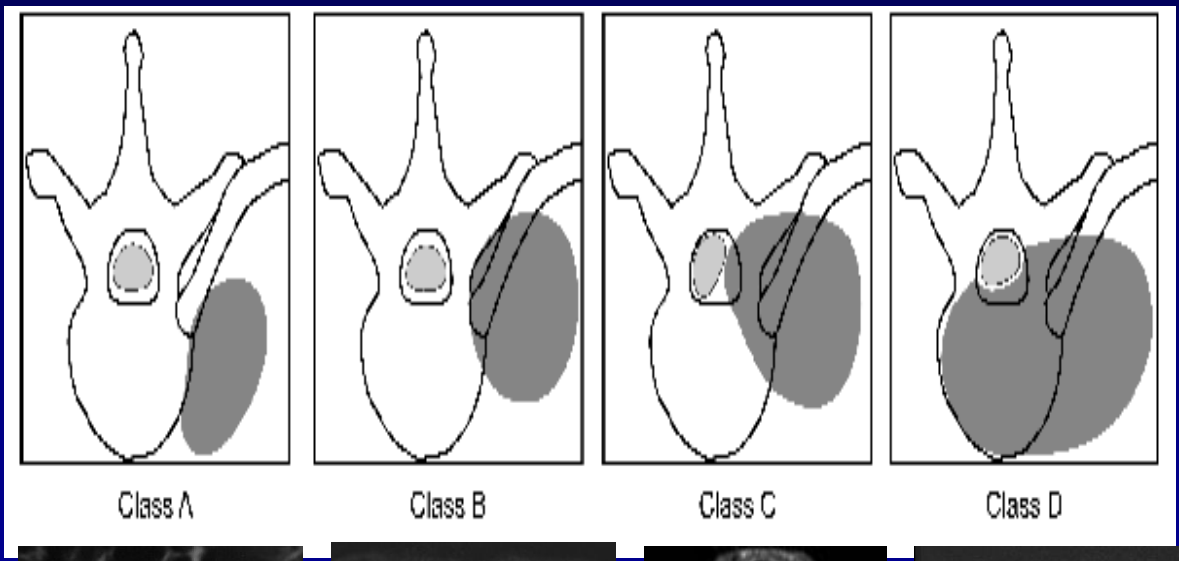
Eligible Patients Who Underwent Surgery



Rusch et al. *JCO* 2007;25:313-318.

MRI
Classification Scheme

A: Periosteum B: Neural Foramen C: Spinal Canal D: Vertebral Body



Pancoast Tumors

Important advances in past 30 years

- **Improvements in resection technique and patient selection**
- **Improvements in multimodality therapy**

WCLC 2017

Management of Early Stage Lung Cancer

Norihiko Ikeda

Department of Surgey
Tokyo Medical University

Lung Cancer Surgery in Japan (2014)

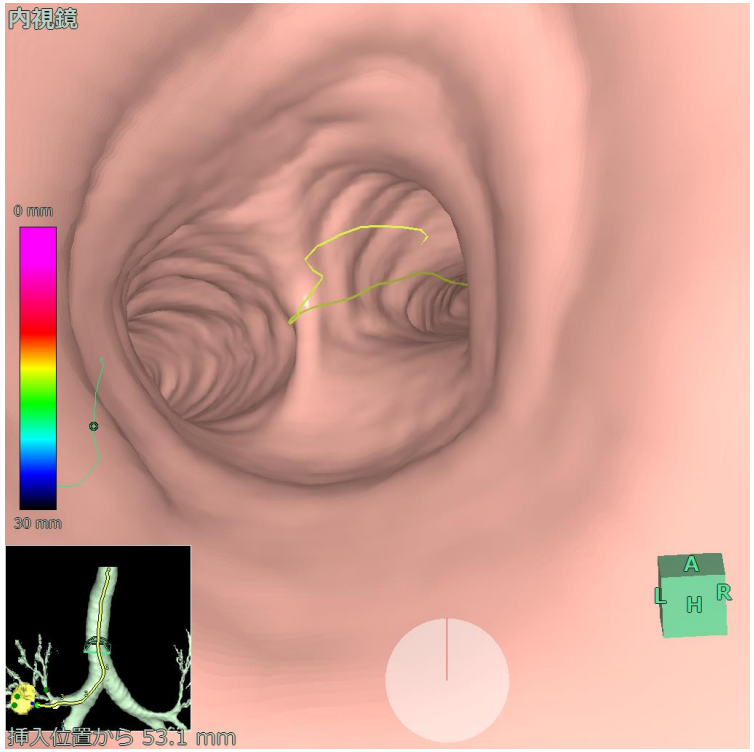
- **No. of operations: 38085 cases ↑**
- **Lobectomy: 72.5%,**
- **Sublobar: 25.2% ↑**
- **VATS:70%↑**
- **Stage IA: 51.6% ↑**
- **Age ≧80: 12% ↑**

Gen Thorac Cardionasc Surg 2016

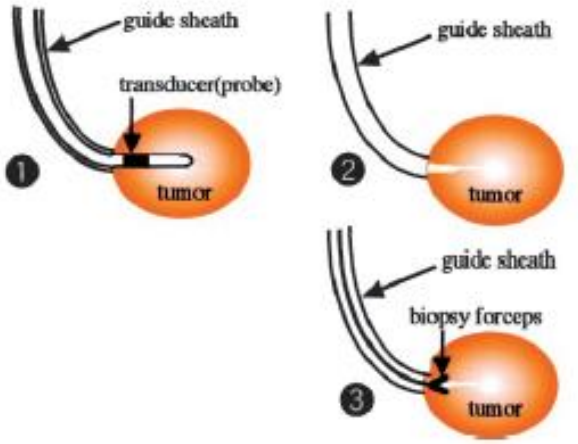
Management of early cancer

- Diagnosis, Localization
- Minimal Invasive Surgery
- Biological Malignancy

Navigation

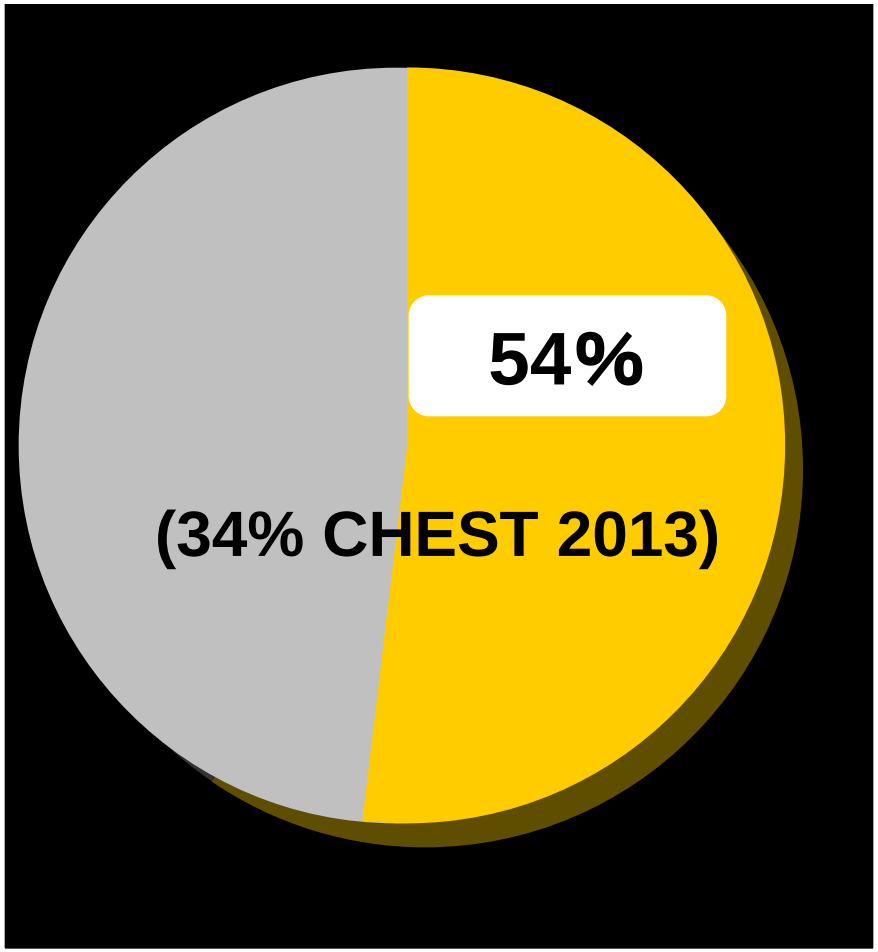


EBUS-GS

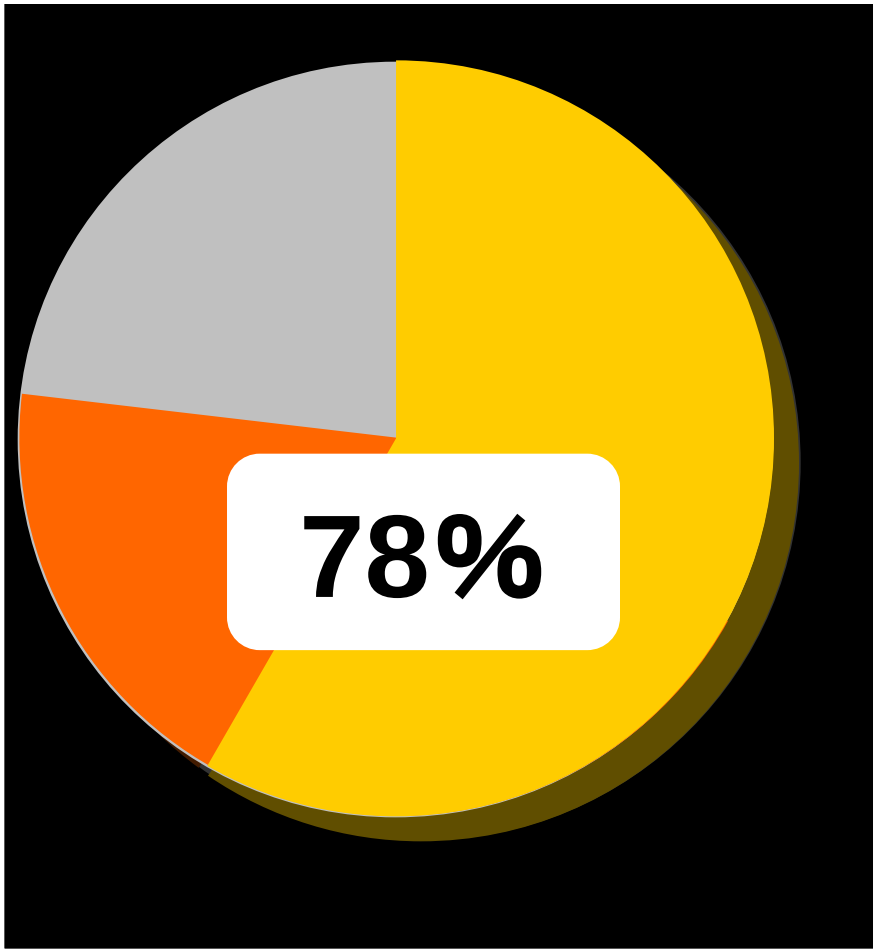


Diagnosic sensitivity of lung ca≦ 2cm

Conventional TBLB



Navigation + EBUS-GS



Minimal Invasive Surgery

- VATS
- Sublobar resection

Safety

Surgical simulation using 3D-CT

Ann Thorac Cardiovasc Surg 2013; 19: 1–5 doi: 10.5761/atcs.ra.12.02174

Review Article

Three Dimensional Computed Tomography Lung Modeling is Useful in Simulation and Navigation of Lung Cancer Surgery

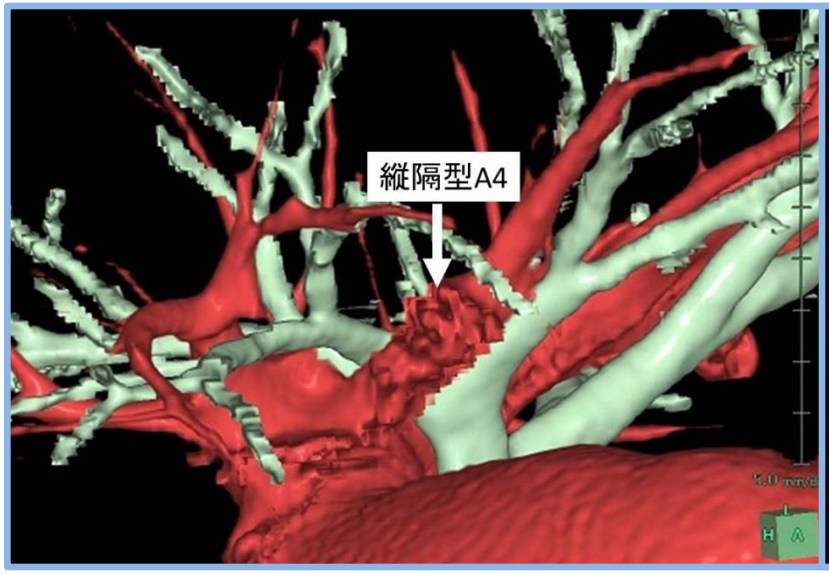
Norihiko Ikeda, MD, PhD,[1] Akinobu Yoshimura, MD, PhD,[2] Masaru Hagiwara, MD,[1] Soichi Akata, MD, PhD,[3] and Hisashi Saji, MD, PhD[1]

European Journal of Cardio-Thoracic Surgery 46 (2014) e120–e126
doi:10.1093/ejcts/ezu375 Advance Access publication 23 October 2014

ORIGINAL ARTICLE

High-quality 3-dimensional image simulation for pulmonary lobectomy and segmentectomy: results of preoperative assessment of pulmonary vessels and short-term surgical outcomes in consecutive patients undergoing video-assisted thoracic surgery†

Masaru Hagiwara[a], Yoshihisa Shimada[a,*], Yasufumi Kato[a], Kimitoshi Nawa[a], Yojiro Makino[a], Hideyuki Furumoto[a], Soichi Akata[b], Masatoshi Kakihana[a], Naohiro Kajiwara[a], Tatsuo Ohira[a], Hisashi Saji[c] and Norihiko Ikeda[a]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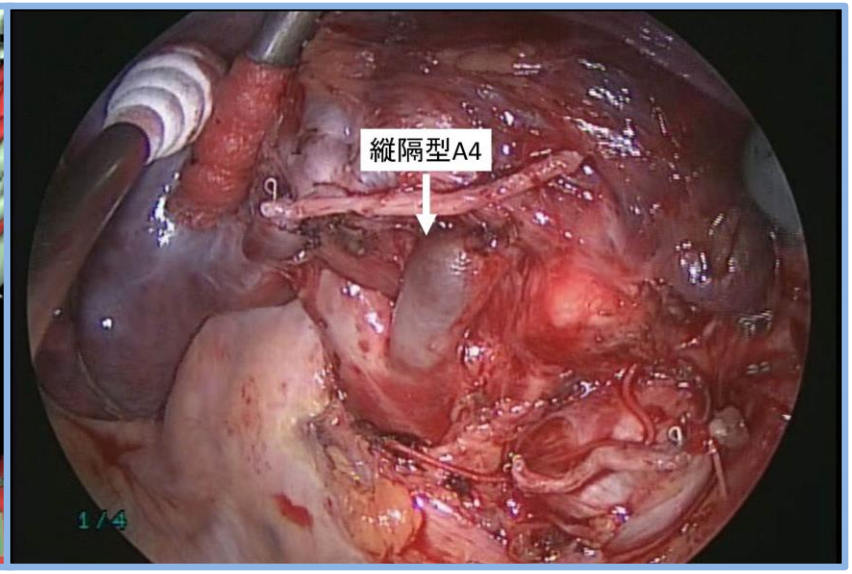
縦隔型A4
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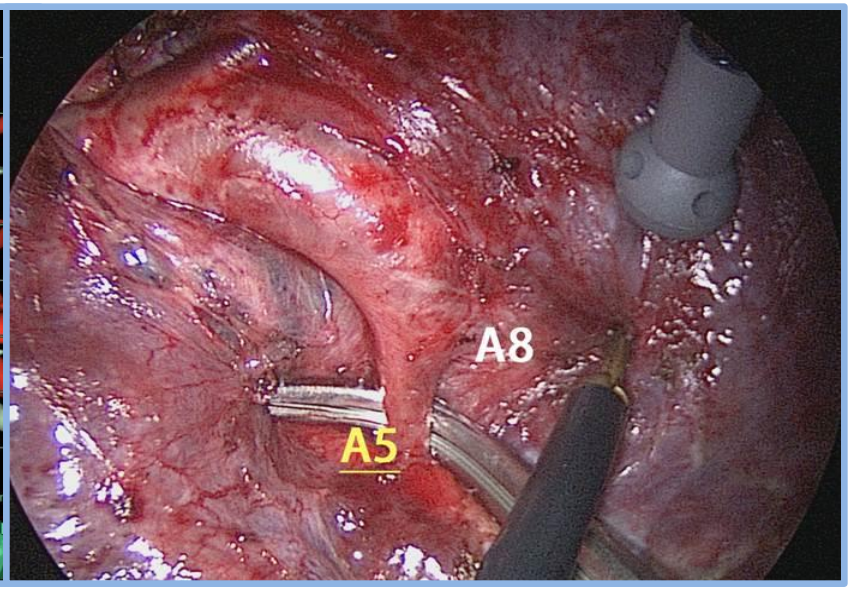
A5
A8


A8
A5

Nodal Upstaging During Lung Cancer Resection Is Associated With Surgical Approach

Quality

Nodal Upstaging

Thoracotomy > VATS

Insufficient nodal dissection in VATS?

Reference and Approach	Number	cN0–pN1 (%)	cN0–pN2 (%)	Overall (%)
Boffa 2012 [9]				
Thoracotomy	7,137	9.3	5.0	14.3
VATS	4,494	6.7	4.9	11.6
Licht 2013 [10]				
Thoracotomy	796	13.1	11.5	24.6
VATS	717	8.1	3.8	11.9
Merritt 2013 [15]				
Thoracotomy	69	17.4	7.2	24.6
VATS	60	8.3	1.8	10.1
Wilson 2014 [16]				
Robotic	302	6.6	4.3	10.9
Present study				
Thoracotomy	797	8.2	5.8	13.9
VATS	187	5.9	3.2	9.1
Robotic	130	6.9	6.2	13.1

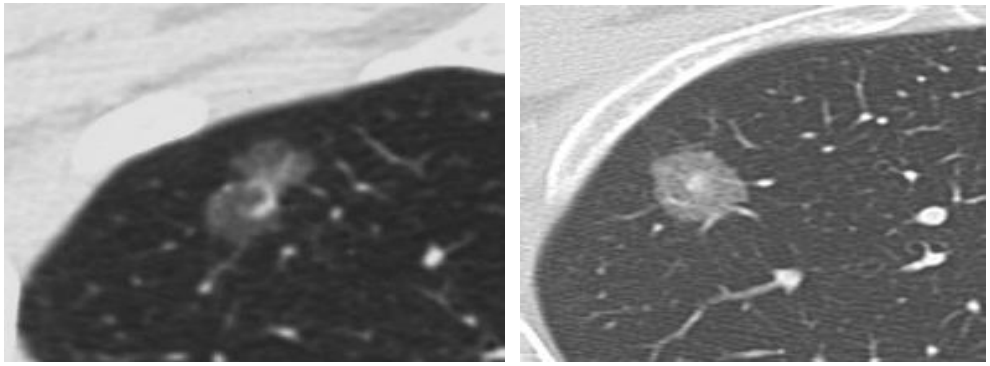
Martin JT ATS 2016

Minimal Invasive Surgery

- **VATS**
- **Sublobar resection**
  - ✓ **Clinical trial**
  - ✓ **Biological malignancy**

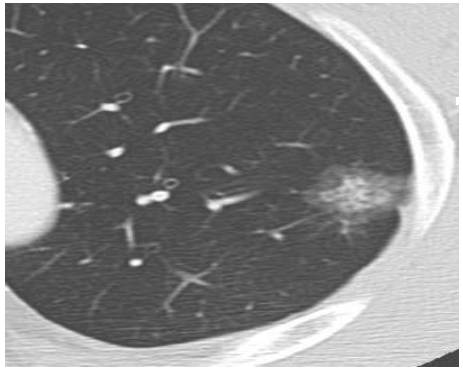
JCOG/WJOG trials for small-sized (≤2 cm) NSCLC

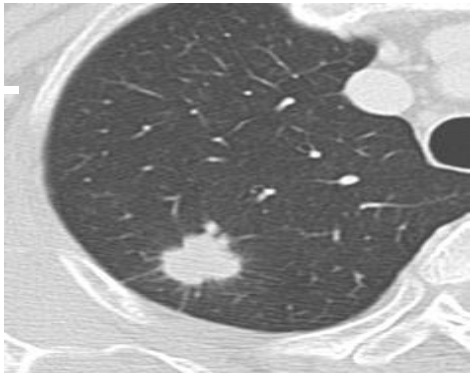
JCOG0804: **0%<Solid<25%**



→ One-arm, wide wedge resection (phase II)

JCOG0802: **25%<Solid<100%**





→ Lobectomy vs. Segmentectomy (phase III)

Biological malignancy

SUVmax and Pathology

		Sq (n=140)			Adeno (n=870)		
		n	SUVmax	T-test P value	n	SUVmax	T-test P value
p stage	IA	54	7.14±4.66		526	2.03±2.71	
	IB	44	11.20±6.21		182	5.42±5.72	
	IIA	20	14.82±5.55		62	6.88±4.97	
	IIB	7	15.58±8.47	<0.001	27	7.40±4.26	<0.001
	IIIA	13	16.18±7.46		67	8.91±6.53	
	IIIB	1	20.32		-	-	
	IV	1	6.36		6	4.00±2.11	
LN meta	N0	107	9.53±6.27	<0.001	752	3.18±4.20	
	N1	23	14.78±5.06		60	7.42±5.90	<0.001
	N2	10	16.09±8.46	<0.01	58	8.03±5.86	
Relapse	(-)	120	10.32±6.45	0.018	782	3.29±4.26	<0.001
	(+)	20	14.11±7.24		88	8.25±6.13	

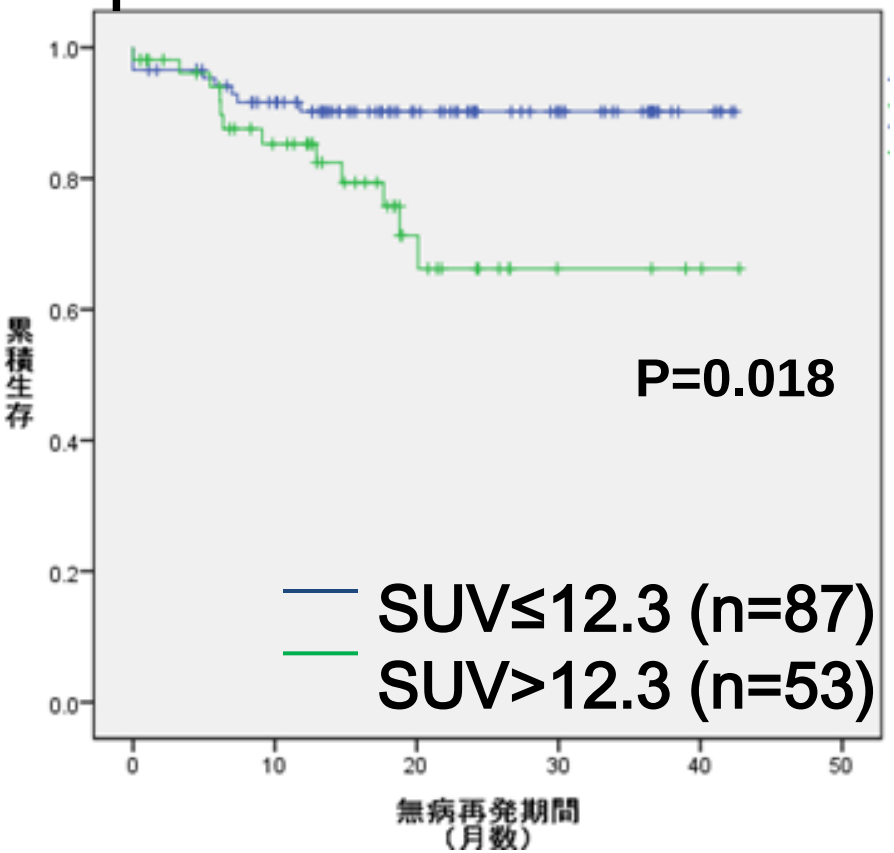
SUVmax of Adenocarcinoma

Classification	No. of cases	SUVmax	P value
AIS+MIA	76	0.51±0.58	<0.001
Lepidic	206	1.46±1.51	
Papillary	317	4.37±4.70	
Acinar	163	4.49±4.22	
Solid	76	8.71±6.81	
Micropapillary	8	6.65±5.19	
Others	24	5.34±7.39	

unpublished

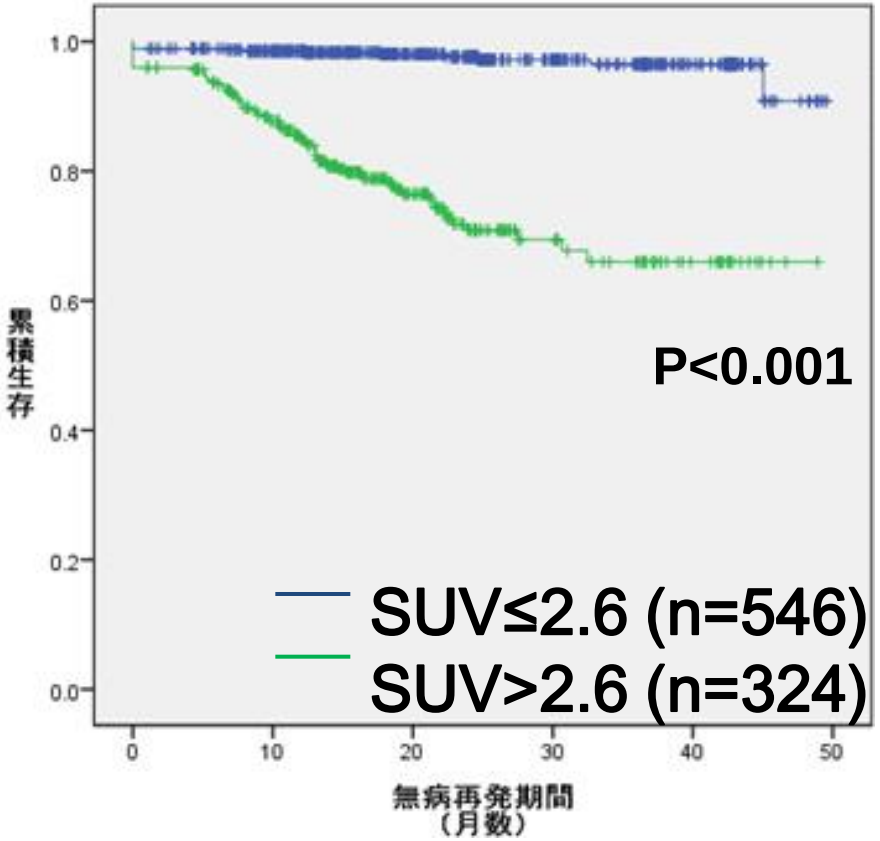
RFS according to revised SUVmax on Squamous and Adeno

Squamous



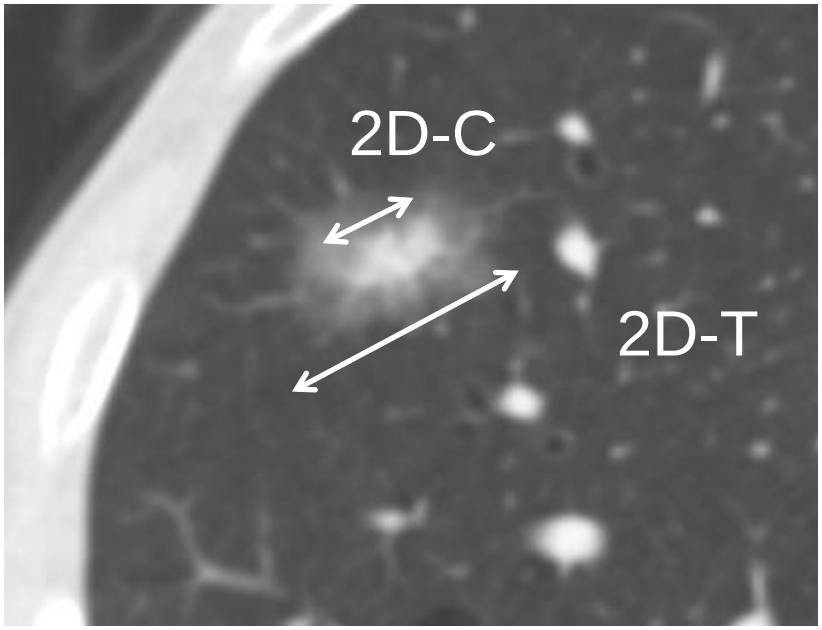
3-year survival
SUV≦12.3: 90%
SUV>12.3: 66%

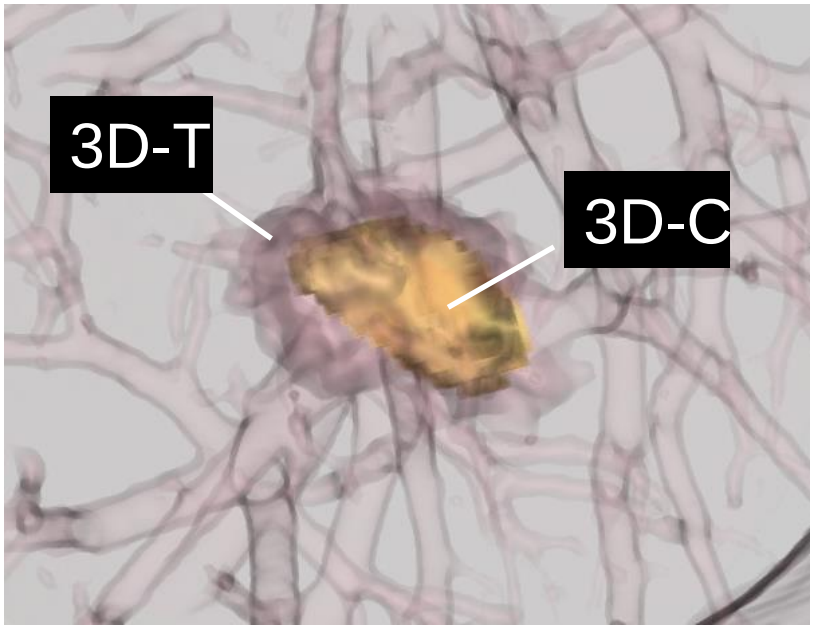
Adeno



3-year survival
SUV≦2.6: 97%
SUV>2.6: 66%

Volumetic analysis of CTR

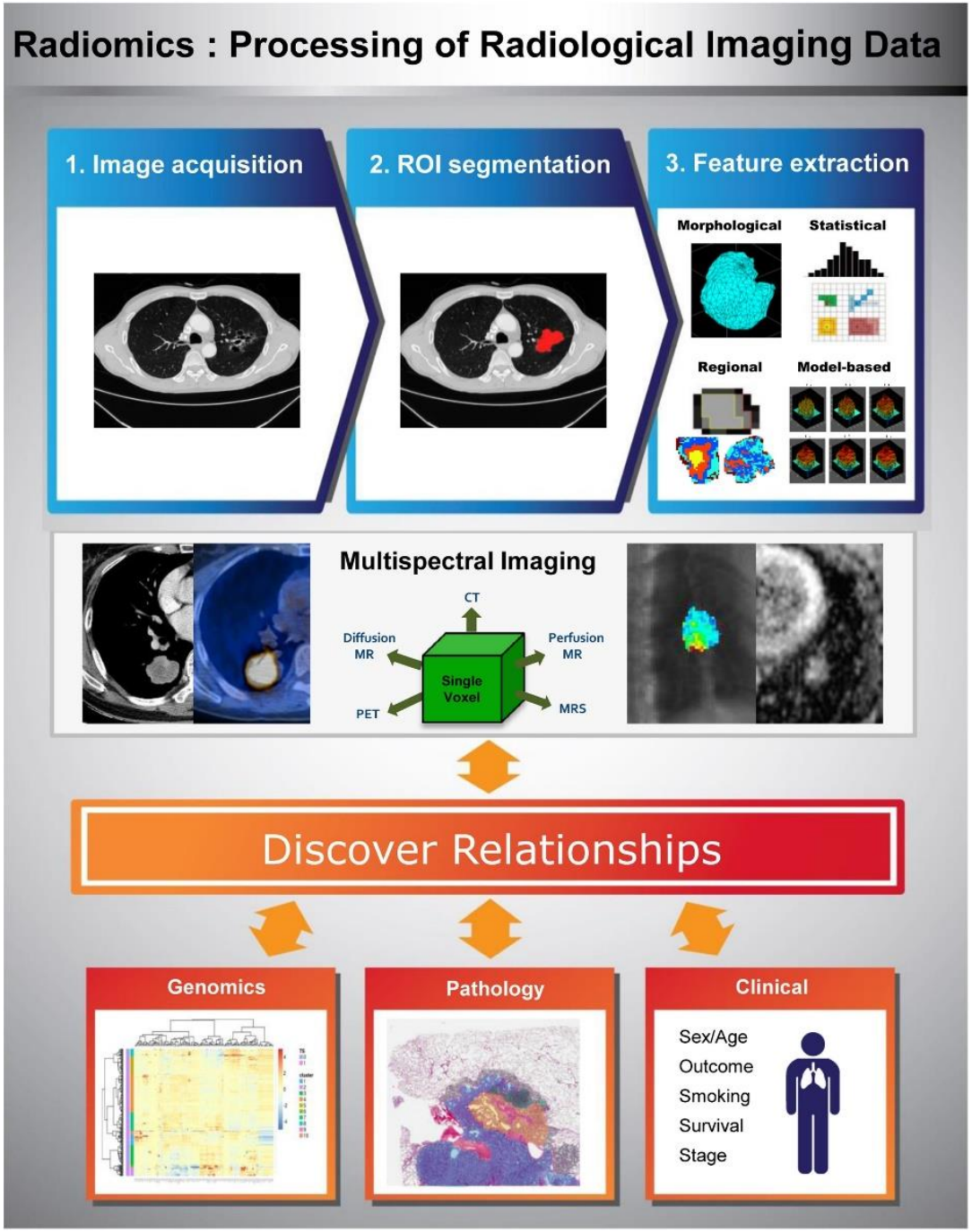




Adenocarcinoma 170 cases
Stage IA 128
Stage IB 18

“Radiomics”

- ✓ **Clinical information**
  - **Stage**
  - **Prognosis**
- ✓ **Image**
  - **CT**
  - **PET**
- ✓ **Pathology**
- ✓ **Translational Oncology**



Lee G Eur J Radiol 2017

MINIMALLY INVASIVE SURGERY FOR LUNG CANCER INCLUDING ROBOTIC

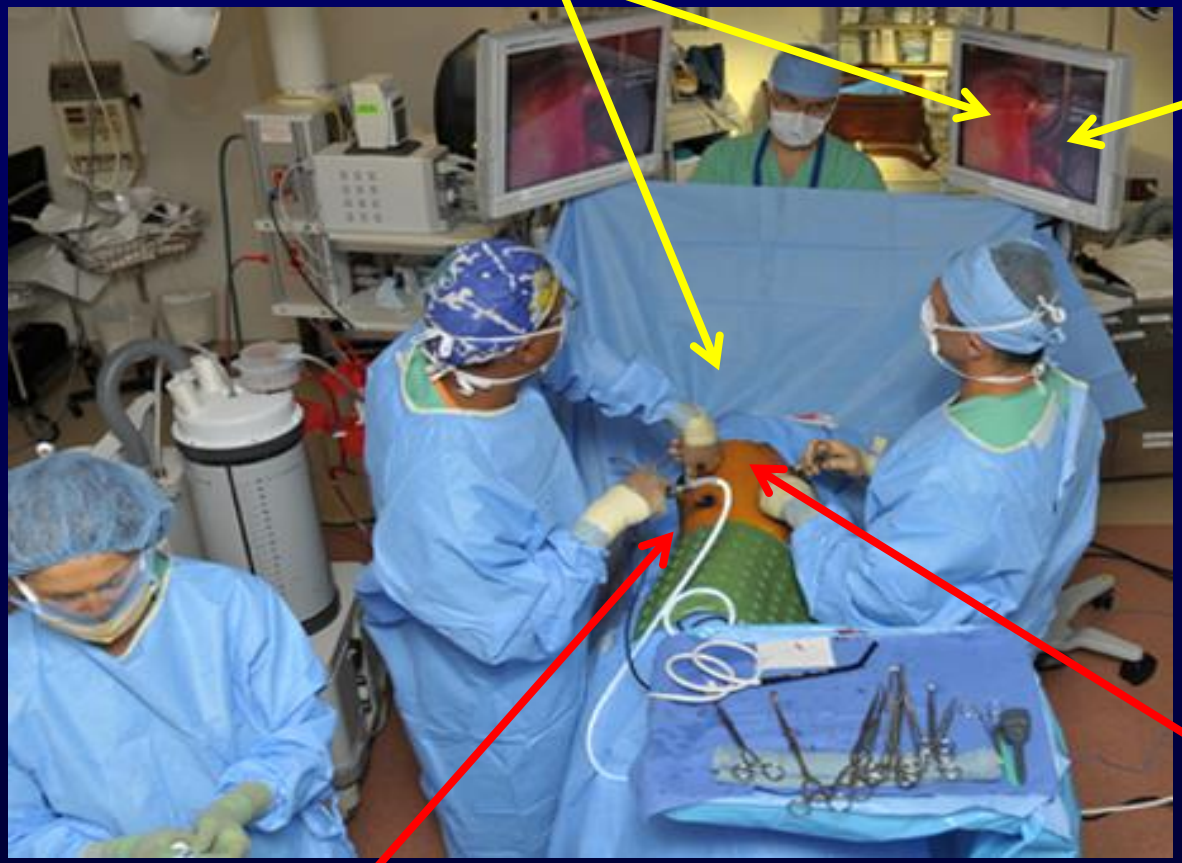
Giulia Veronesi

HUMANITAS
CANCER CENTER

IASLC 2017

Diversion of true and virtual operating field

Lack of 3D vision



Bad ergonomics

Tremors amplification

Fulcrum effect

Instable surg field (camera assistant)

Counteractive movements

ADVANTAGES ROBOTIC APPROACH

Technical improvements:
Intuitive movements
Tremor filtration
Increased degrees of freedom
Motion scaling
Stereoscopic vision
Stable camera platform
Equivalence between the
dominant and non-dominant hands
Eye-hand-target alignment

Clinical improvements

NODAL UPSTAGING
SEGMENTS
OCCULT N2
LOCALLY ADVANCED

Table 6. Outcomes of Patients Undergoing Open, VATS, or Robotic Pulmonary Resections Performed Only By Robotic Surgeons

Outcome	Open (n = 466)	VATS (n = 555)	Robotic (n = 391)	*p* Value[a]	*p* Value[b]
Mortality	12 (2.6%)	7 (1.2%)	1 (0.3%)	0.062	0.003
LOS (mean)	8.0	6.4	6.0	0.454	0.001
Routine discharge	301 (64.6%)	343 (61.8%)	250 (63.9%)	0.502	0.843
Prolonged LOS	46 (9.9%)	42 (7.6%)	18 (4.6%)	0.055	0.003
Any complication	236 (50.6%)	275 (49.5%)	170 (43.4%)	0.065	0.036
Bleeding complication	12 (2.6%)	8 (1.4%)	7 (1.8%)	0.678	0.430

[a] Between robot and VATS resections. [b] Between robot and open resections.

- **KENT M. 2014**

Surgical robot device market
$3.2 billion in 2014
$20 billion by 2021

WinterGreen Research new study: Market Shares, Strategy, and Forecasts, Worldwide, 2015 to 2021

TAKE HOME MESSAGE

VATS is the standard treatment for stage I and selected II disease

Rats introduced indusputable technical advantages

No clear benefit of RATs is demonstrated compared to expect a trend in mortality reduction and better lymph node dissection

Higher cost is the main limitation to wide diffusion and adoption of RATS, costs are expected to be reduced when competitors will enter the market

Most advantages of RATS are expected in more complex procedures (pretreated N1 or N2 diseases or anatomical segmentectomies)

More studies and longer fup are required to define the role of

VATS and RATS

IASLC 2017

There is diffuse awareness that robotic surgery will become the minimally invasive approach of the future

Lung Cancer Surgery for High Risk Patients

Claudio Suárez Cruzat
Head Thoracic Surgery
Clinica Santa Maria, Santiago de Chile

Challenge in thoracic oncology

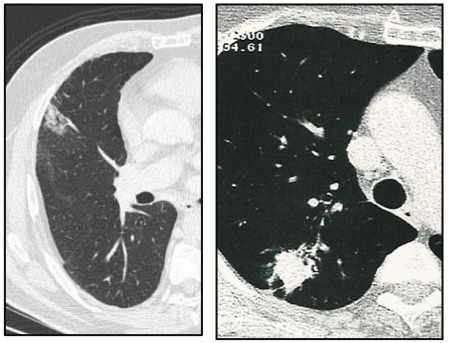
-heavy smokers
-cardiovascular and/or respiratory diseases
-prevents for getting optimal results in lung cancer treatment

3.- If the patient persists in the high or moderate-risk group (VO2 10-15ml/kg/min with VE/VCO2 <35) we prefer sublobar resections

3.1

- If the tumor is:
  - a pure GGO or predominantly GGO (<50% solid)
  - less than 2 cms
- VATS wide wedge resection + lymph node sampling.
- Frozen section must confirm:
  - <50% is invasive or invasion area is smaller than 5mm and Margins >1cm
  - To persevere with wedge resection.

3.- If the patient persists in the high or moderate-risk group (VO2 10-15ml/kg/min with VE/VCO2 <35), we prefer sublobar resections.



3.2

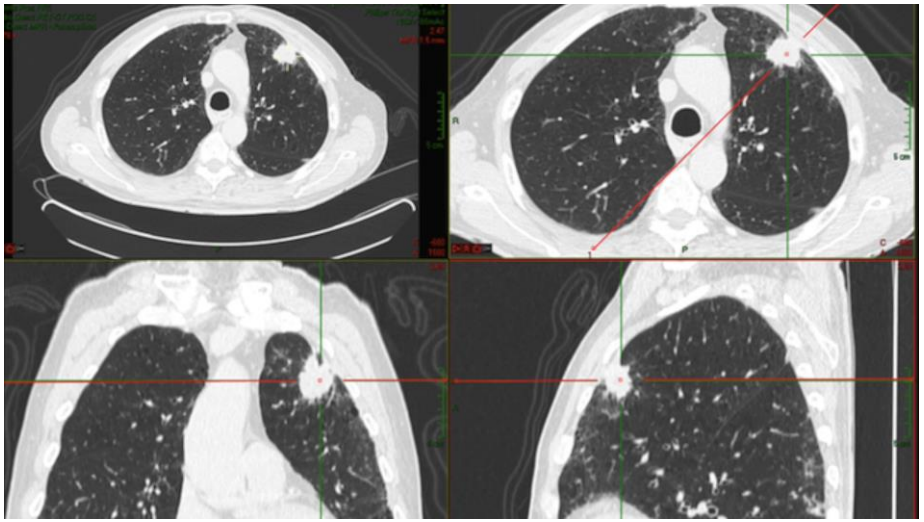
- If these pathological requirements are not met: (or for)
  - Solid tumors >10 mm or mostly solid/GGO tumors or
  - GGO tumors >20 mm with >25-50% solid, or
  - Invasive component >5 mm
- Perform an anatomic segmental resection, VATS/ thoracotomy, associated with hilar and mediastinal lymphadenectomy.

*Asamura H et al. Oncology Group 0201. J Thorac Cardiovasc Surg 2013;146:24-30
*Hattori A et al. JTO 2017;12(6):954-962
*Aokage K et al. Jpn J Clin Oncol,2017,47(1):7-11

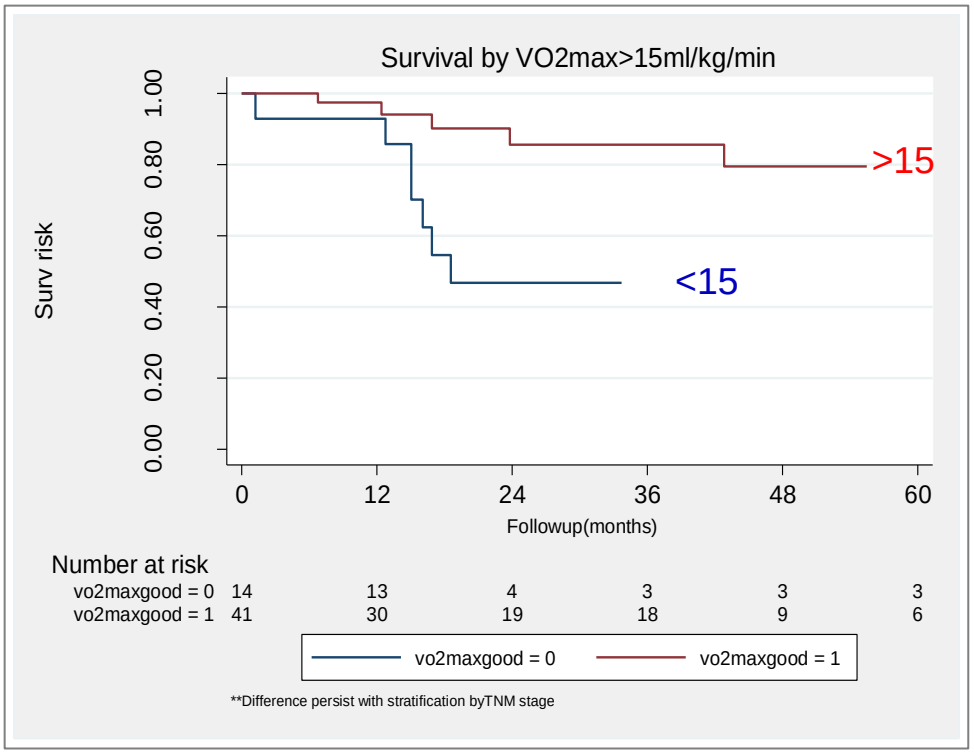
Even in larger tumors, we will attempt sublobar resection in high-risk patients. We consider that although the risk of local recurrence is high, the lower morbidity and mortality rate of sublobar resections justifies this approach in this patients.

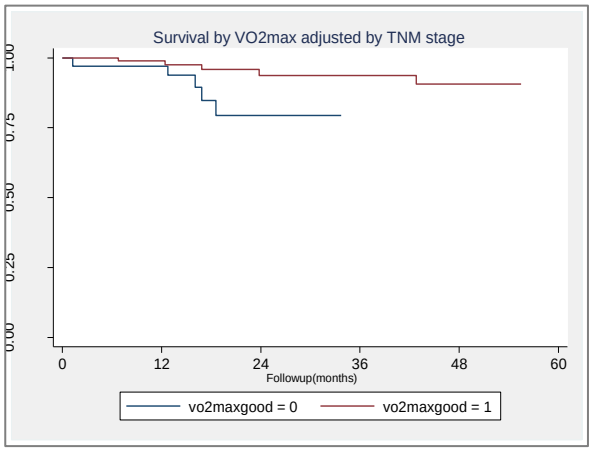
We believe that a sublobar resection with margins >1 cm, grant better quality of life than a patient who becomes oxygen dependent, dies in the postoperative period or has not been resected due to the impossibility of lobectomy.

Male, 77yo,heavy smoker, COP, SUV 11,7, EBUS(-)
DLCO-VEF1>60%, CPETVO2 9 slope 46 After Training 13-42



Pathology: squamous cell ca 35mm, PL1. Fibrous adherence, margin 12 mm. Lymphovascular invasion (+), CPL(-)





Stratified log-rank test for equality of survivor functions

vo2maxgood	Events observed	Events expected(*)
0	6	2.47
1	6	9.53
Total	12	12.00

(*) sum over calculations within stage

chi2(1) = 7.14
Pr>chi2 = 0.0075

Survival in Resected NSCLC Lung Cancer by VO2 max, adjusted by TNM

Patiens with VO2 peak <15 ml/kg/min present a worse survival (obtained in series of 55 patients in the last preoperative evaluation, after training) 2017, Clinica Santa María, Santiago, Chile

Surgical Skills:

Salvage Surgery

Hans Hoffmann

Dept. of Thoracic Surgery, Thoraxklinik, University of Heidelberg, Germany

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Salvage Thoracic Surgery...

…is defined as surgical resection of persistent or recurrent primary lung cancer after previous *local treatment without surgery*

Indications for Salvage Surgery

Persistent or recurring primary lung tumor *or* specific complications

- after *stereotactic radiotherapy (SBRT)* or other ablative therapies

"Salvage surgery after SBRT may be rather straightforward and in many cases even feasible by a minimally invasive approach."

- after *definitive* chemoradiation therapy for Stage III non-small cell lung cancer

"Surgery after a full dose of chemoradiation can be quite challenging and the dissection of the anatomical structures is technically demanding."

Indications for Salvage Surgery

Persistent or recurring primary lung tumor *or* specific complications

- after *stereotactic radiotherapy (SBRT)* or other ablative therapies
- after *definitive* chemoradiation therapy for Stage III non-small cell lung cancer

- Common to all indications is that they are always individual case decisions.
- The published series are all retrospective, comprise only a small number of patients and refer to a long period at a single institution.

Indications for Salvage Surgery

Persistent or recurring primary lung tumor *or* specific complications

- after *stereotactic radiotherapy (SBRT)* or other ablative therapies

- *Whereas in the past SBRT was typically considered an alternative to surgery for patients unfit or at high risk for surgery, the modality is now being **used more often also for** healthier, potentially **operable patients**.*

Indications for Salvage Surgery

Persistent or recurring primary lung tumor *or* specific complications

- after *stereotactic radiotherapy (SBRT)* or other ablative therapies

- after *definitive* chemoradiation therapy for Stage III non-small cell lung cancer

Table 1. Patients' Clinical and Pathologic Characteristics According to Completeness of Surgery

	Total N	R0 N (%)	R1/2 N (%)
Interval RT—Surgery			
0-3 mo	12	8 (66.7)	4 (33.3)
≥3 mo	23	19 (82.6)	4 (17.4)
Resection			
Explorative thoracotomy	6	0 (0.0)	6 (100.0)
Lobectomy	9	9 (100.0)	0 (0.0)
Extended* lobectomy	3	3 (100.0)	0 (0.0)
Pneumonectomy	7	7 (100.0)	0 (0.0)
Extended* pneumonectomy	10	8 (80.0)	2 (20.0)
30-day mortality			
No	33	25 (75.6)	8 (24.2)
Yes	2	2 (100.0)	0 (0.0)
90-day mortality			
No	31	24 (77.4)	7 (22.6)
Yes	4	3 (75.0)	1 (25.0)

*Single Institution series of **35 cases** that underwent salvage surgery after definitive chemoradiation therapy for locally advanced non–small cell lung cancer over a period of 10 years, representing **1.2% of all lung resections** for lung cancer performed at their institution.*

OS

2yr: 38%

3yr: 32%

Take Home Message: Salvage Thoracic Surgery...

- …after local failure of SBRT in highly select individuals is feasible and safe, and has an overall acceptable morbidity and mortality.

- …after a full dose of chemoradiation in advanced stages can be quite challenging and surgically demanding. Retrospective data show acceptable morbidity, mortality and promising outcome.

- Each individual case should be reviewed in a multidisciplinary tumor board (MTB) and the surgery should be performed by an experienced team.

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Meet the Expert

do extended resections improve T4 lung cancer outcomes?

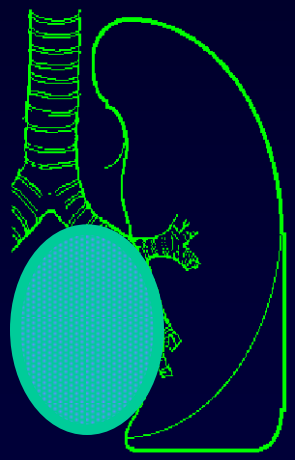
Dominique H. Grunenwald, MD

Professor Emeritus

Thoracic and Cardiovascular Surgery

Pierre&Marie Curie University, Paris. F

technical resectability



SVC / great vessels
left atrium
trachea / carina
satellite nodules
vertebral bodies

yes

heart / ventricle
pleural effusion
esophagus

no

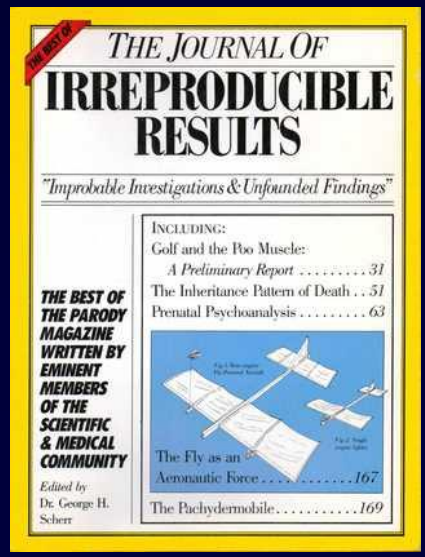
is there a role for surgical resection in T4 lung tumors?
(" surgical " stage IIIA when N0-1)

- T4 nsclc is an heterogeneous group of patients
- decision making needs a case by case discussion
- surgery must perform an en bloc excision of invaded structures
- it needs a particular expertise of the surgical team
- serious perioperative complications can occur
- long-term outcome depends on nodal status
- adequate surgery has demonstrated ability to achieve long term survivals
-

critical point of view

a surgical procedure which would not be reproducible in other centers would never be recognized as an option for practice

it is important to distinguish the real progress that could be applied throughout the world, from the simple reports of individual performances or exploits



take home messages (2)

encouraging long-term survival rates can be expected, despite non negligible postoperative mortality rates

the 8th edition of TNM staging system confirmed its adaptation to these progress, by classifying T4N0-1 tumors in a "surgical" category, the stage IIIA

given the negative prognostical influence of N2 nodal status observed in any T4 situation, a thorough mediastinal evaluation is highly recommended to preclude these patients from surgery

Doctors of Thoracic Surgery

Technical Issues after Neoadjuvant Chemoradiation For Stage IIIA N2 NSCLC

A Surgeon's Perspective

Gail Darling MD FRCSC FACS
Professor Thoracic Surgery
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Toronto General Hospital
University Health Network

Contraindications to surgery for Stage IIIA NSCLC

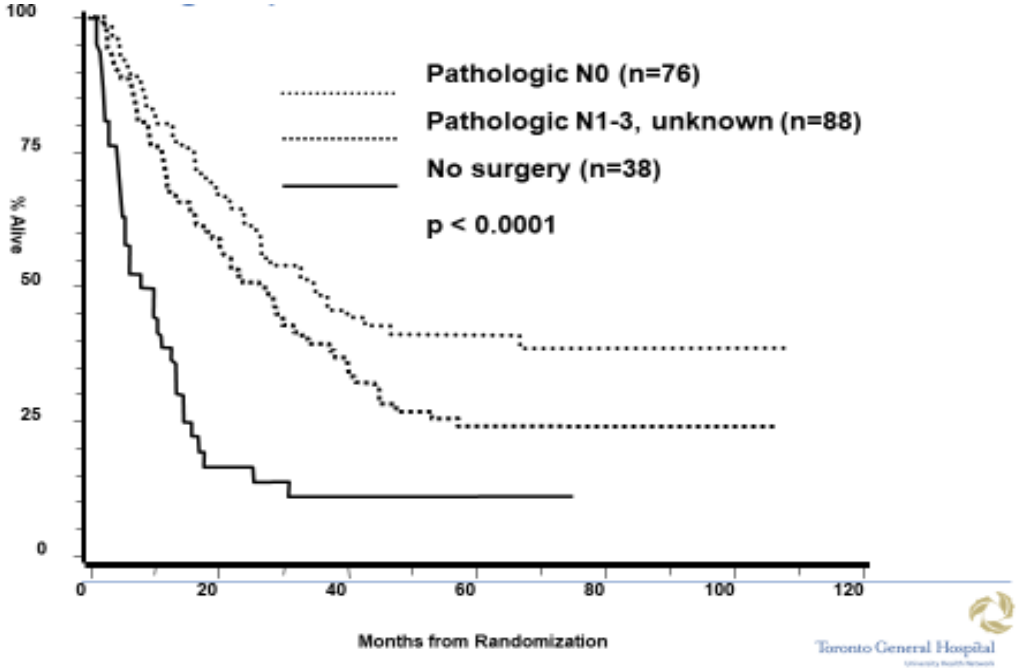
- Extracapsular N2
- Fixed bulky nodes
- Inability to achieve an R0 resection
- T4N2
- Patient not fit for planned resection (right pneumonectomy required?)

Restaging after Induction therapy

- CT scan: to assess response but primarily to confirm resectability and exclude progression
- PET: to rule out progression; assess response to determine if surgery is required?

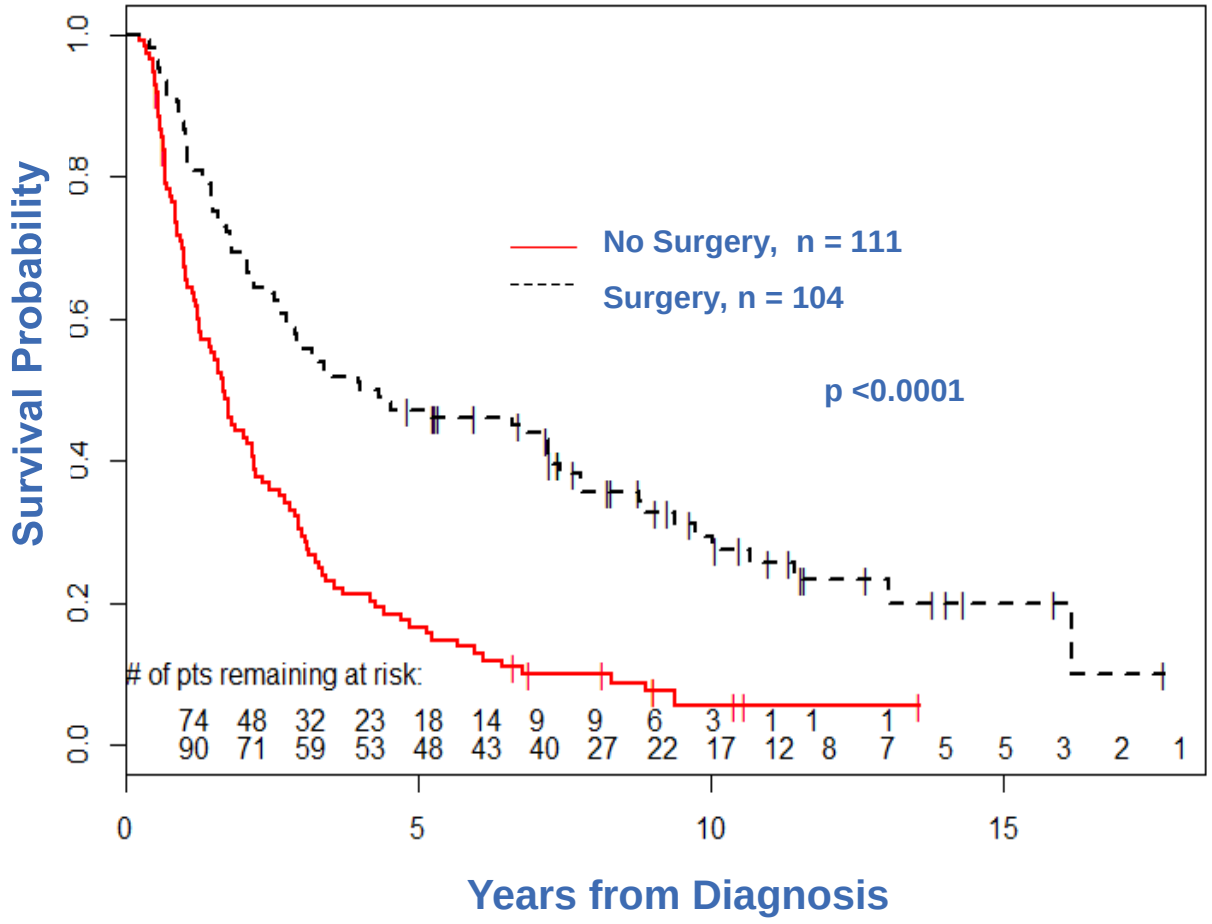
Restaging after Induction therapy

Int0139 best survival for pN0 but pN1-3 still better than no surgery!



Doctors of Thoracic Surgery

Overall Survival for IIIA N2 NSCLC Patients



Surgery has a role in Select Stage IIIA N2

Toronto General Hospital
University Health Network

What type of surgery should be selected for GGO-containing tumors?

P. De Leyn, H. Decaluwé and W. Dewever
Department of Thoracic Surgery and Radiology
University Hospitals Leuven

IASLC 2017

Pure GGO lesions

- Etiology : Non-specific inflammation
  Fibrosis
  Neoplasm

- Recent guidelines (2017) : pure GGO ≥ 6 mm CT scan at 6-12 months and then every 2 years

Fleischner Society; Radiology 2017;153:462-9

A nomogram for predicting the risk of invasive pulmonary adenocarcinoma for patients with solitary subsolid nodules

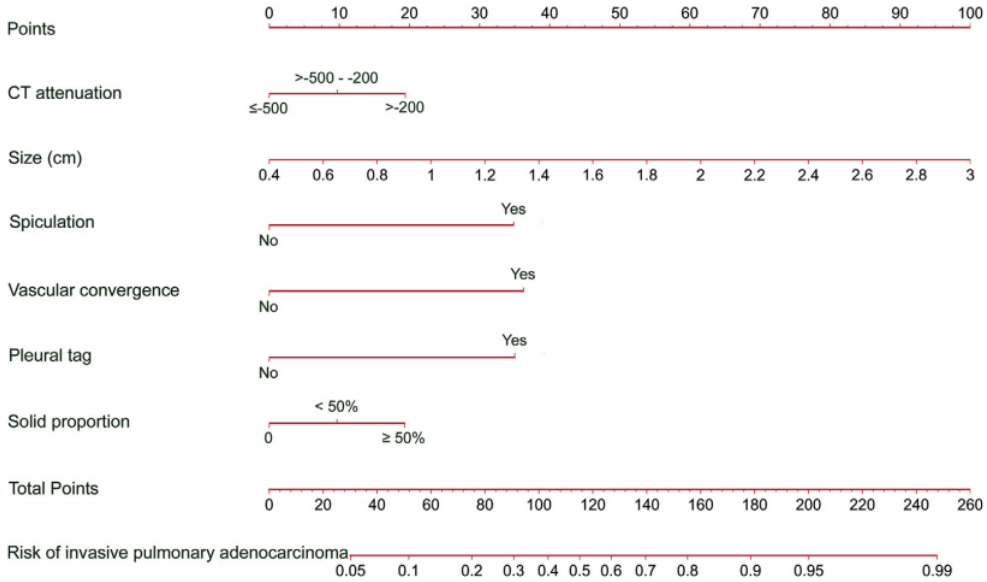


FIGURE 2. A nomogram predicting the risk of IPA for patients with solitary peripheral sub-solid nodules. The value of each of variable was given a score on the point scale axis. A total score could be easily calculated by adding each single score and, by projecting the total score to the lower total point scale, we were able to estimate the probability of IPA.

Jin et al., J Thoracic Cardiovasc Surg 2017;153:462-9

TAKE HOME MESSAGE

- **Pure GGO lesions** are often a challenge for the surgeon.
- Repairing techniques are essential
- Size and pleural retraction are predictive factors for invasive adenocarcinoma. Growing lesions > 10 mm, or appearance of solid component should be resected
- If peripheral and small, wedge resection is enough. When lesion is deep, segmentectomy is indicated

TAKE HOME MESSAGE

- **Mixed nodules** : C/T ratio is important to predict aggressiveness of adenocarcinoma (both local and lymphatic spread)

- Lesion ≤ 2 cm with C/T ratio ≤0.25 : very good prognosis with limited resection (segmentectomy) with LN dissection (margin = tumor size). Whether wedge could be sufficient will depend on results of prospective randomized trials

TAKE HOME MESSAGE

- **For Mixed nodules** ≤ 2 cm with C/T ratio > 0.5 results of prospective randomized studies need to be awaited. So far lobectomy with nodal resection is recommended.

- Limited role of TTP and frozen selection in subtyping aggressive types of adenocarcinoma (micropapilarry and solid patterns) which necessitate lobectomy. High specificity, low sensitivity

Resection of GGOs: How, When and Why?

David H. Harpole, M.D.
Professor of Surgery
Associate Professor of Pathology
Duke University
Durham, NC, USA
Co-chair NCI Thoracic Malignancy Steering Committee
Bethesda, MD, USA

Summary

- GGO-containing CT lesions require a multi-modality team including Thoracic Imaging to select most appropriate surgical candidates
- Localization techniques are often useful for minimizing resection size for diagnosis
- Minimally-invasive approaches to resection predominate in 2017
- Resections with node dissection required for TNM:
  - >3.0 cm size: Lobectomy
  - 1.0-3.0 cm size: Consider segmentectomy or lobectomy
  - <1.0 cm size with significant solid component: Wedge resection may be adequate (small pure GGOs should be followed)
- Resection margins should be > 1.0 cm from CT-sized mass

  (Do not use palpation to estimate margin of resection)