

A Practical Guide to Advances in Staging and Treatment of NSCLC

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Objectives

- Revised staging system
- Advances in mediastinal staging
- Stage dependent nature of NSCLC treatment
- Advances in surgical management of resectable NSCLC

Staging revision

- AJCC and UICC: 7th edition published in 2009
- Resulted from IASLC International Database for Lung Cancer

Staging revision

Changes to T descriptor

6 th ed.	7 th ed.	N0	N1
T1 (<3 cm)	T1a (≤ 2 cm)	stage IA	stage IIA
	T1b (2-3 cm)	stage IA	stage IIA
T2 (≥ 3 cm)	T2a (3-5 cm)	stage IB	stage IIA
	T2b (5-7 cm)	stage IIA	stage IIB
T3 (local invasion)	T3 (local invasion or >7 cm)	stage IIB	stage IIIA

Staging revision

Changes to T descriptor

6 th ed.	7 th ed.	N0	N1	N2
T4 (multiple nodules same lobe)	T3	stage IIB	stage IIIA	stage IIIA
T4 (effusion)	TM1a	stage IV	stage IV	stage IV
T4 (extension)	T4	stage IIIA	stage IIIA	stage IIIB

Staging revision

Changes to M descriptor

6 th ed.	7 th ed.	N0	N1	N2
M1 (ipsilateral lung)	T4	stage IIIA	stage IIIA	stage IIIB

Staging revision

Summary in practical terms

- "Early" T descriptors broken down by size
 - >5 cm now stage II (implications for adjuvant chemotherapy)
- Multiple nodules becoming "more resectable"

Mediastinal staging

Endobronchial ultrasound



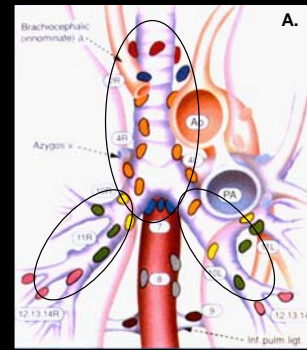
EBUS

Endobronchial ultrasound

- Allows "incisionless" biopsy of mediastinal lymph nodes and masses
 - Ultrasound guidance
 - Easy to correlate with CT and PET
 - Even subcentimeter nodes
 - "Core" biopsies
 - Biopsy of central lung masses
 - Opens the "black box" of the chest (pulmonary hilum)

EBUS

Mediastinal lymph node staging



EBUS

Mediastinal lymph node staging

Right Level 4

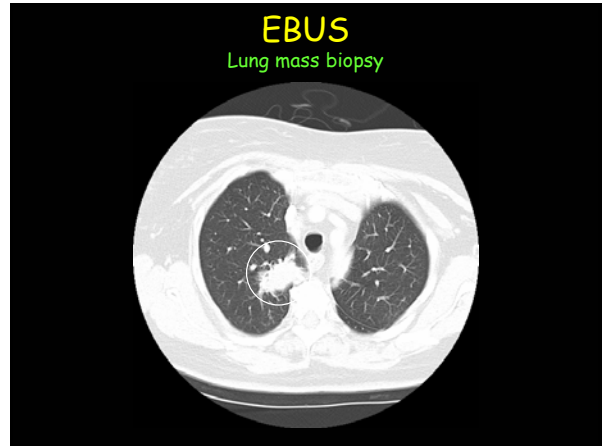
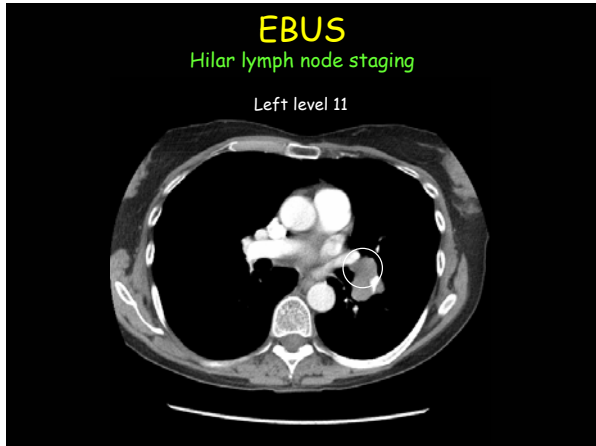
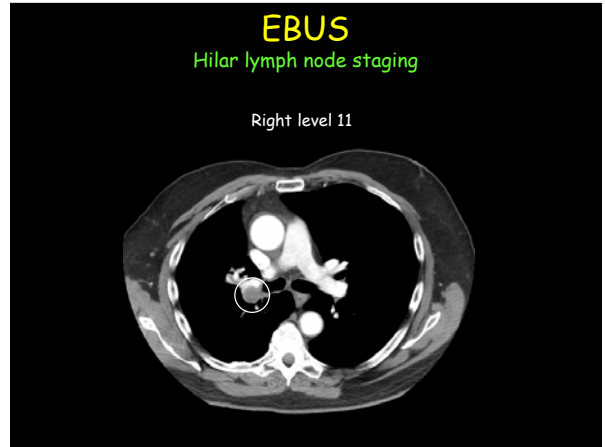
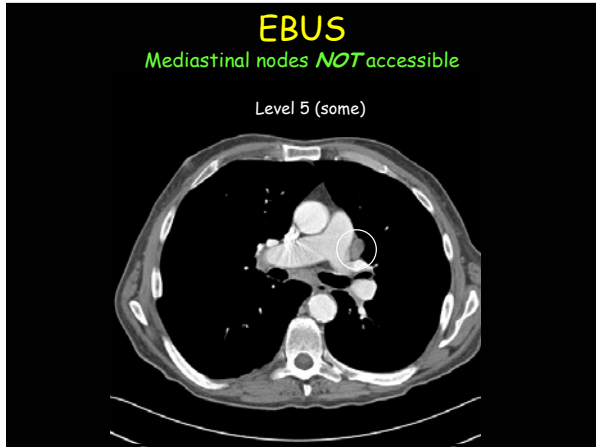
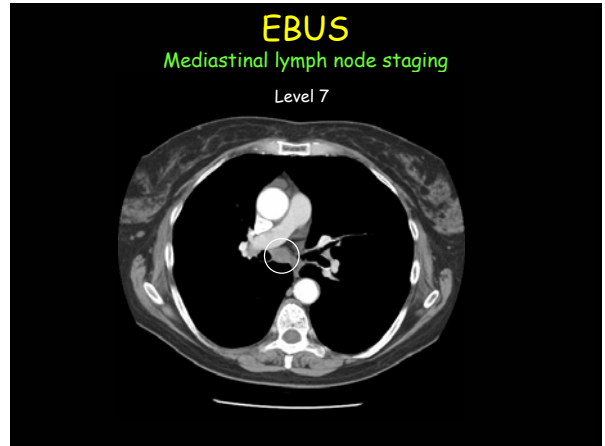
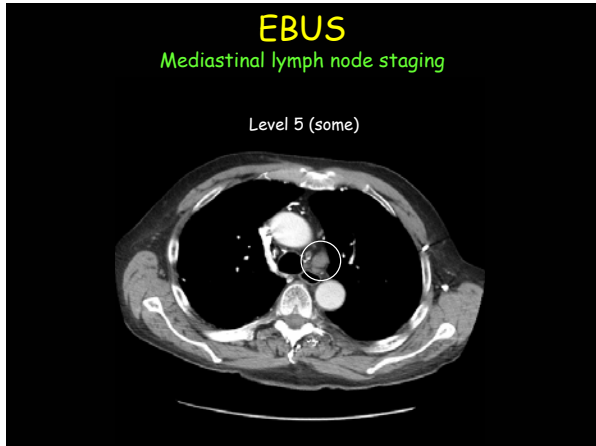


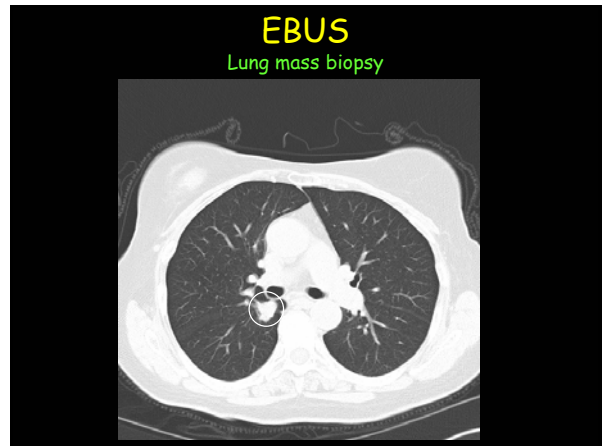
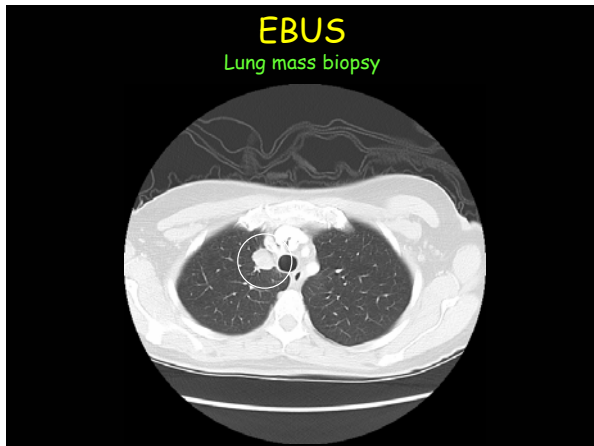
EBUS

Mediastinal lymph node staging

Left level 4

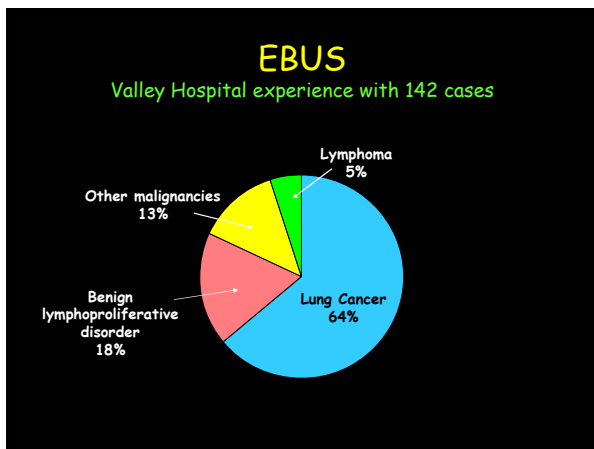






- ### EBUS
- Practical aspects
- Biopsy farthest nodes first
 - Need diagnostic tissue
 - pathology or normal lymphocytes
 - Very low complication rate
 - pneumothorax, bleeding

- ### EBUS
- Controversial aspects
- What is the false negative rate?
 - range: <10% to >30%
 - Who should be performing it?
 - Pulmonologists versus thoracic surgeons
 - General anesthesia or conscious sedation?
 - Is immediate pathologic assessment needed?



- ### NSC lung cancer treatment
- Stage dependent
- Stage 1: Resection only
 - Stage 2: Resection plus adjuvant chemotherapy
 - Stage 3: Multimodal approaches
 - Stage 4: Systemic therapies

Lung cancer resection

Role of anatomic lobectomy

- Standard of care remains lobectomy
 - Anatomically performed
 - Mediastinal lymph node sampling/dissection

Randomized Trial of Lobectomy Versus Limited Resection for T1 N0 Non-Small Cell Lung Cancer

Lung Cancer Study Group (Prepared by Robert J. Ginsberg, MD, and Lawrence V. Rubinstein, PhD)

Lung Cancer Study Group 821

- Clinical T1 N0 patients accrued
- Intraoperative randomization after confirming T1 N0 status:
 - Anatomic lobectomy
 - Segmentectomy or wedge resection
- 247 eligible patients

Lobectomy versus limited resection

Lung Cancer Study Group 821

- Minimum of 4.5 years of followup

Group	n	Loco-regional recurrence	Death with lung cancer	Death from any cause
Lobectomy	125	8 (6.4%)	21 (17%)	38 (30%)
Limited	122	21 (17%)	30 (25%)	48 (40%)

LCSG 821

Interesting caveats

- Before PET scan
- Before CT scan
- Before CT "screening"
- Study terminated due to loss of funding (death rates would be worse if followup was longer)

The evolution of VATS lobectomy

The early days: The problem

- Adaptation of thoracotomy techniques to VATS hampered by:
 - Inexperience of operators using video
 - Inadequate instrumentation for small ports

Currently, techniques for video-assisted thoracic surgery are being borrowed from the open conventional thoracotomy. However, these same techniques have made video-assisted lobectomy difficult, burdensome, and even dangerous.

The evolution of VATS lobectomy

One solution

Change the procedure to fit the incision

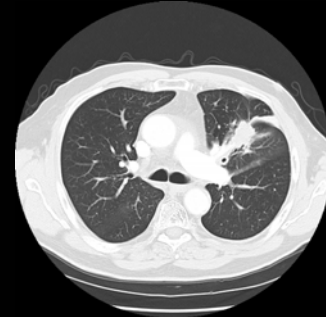
The evolution of VATS lobectomy

The early days

- Simultaneously stapled (SIST) lobectomy:
 - Modifying the operative technique to fit the incision
 - Non-anatomic stapling of pulmonary hilum
 - Is this merely a "large wedge resection"?

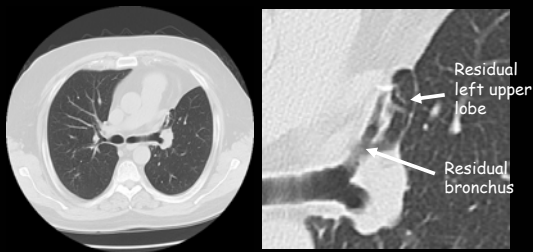
SIST lobectomy

A "large wedge resection"?



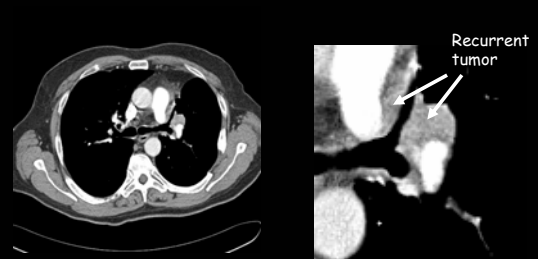
SIST lobectomy

A "large wedge resection"?



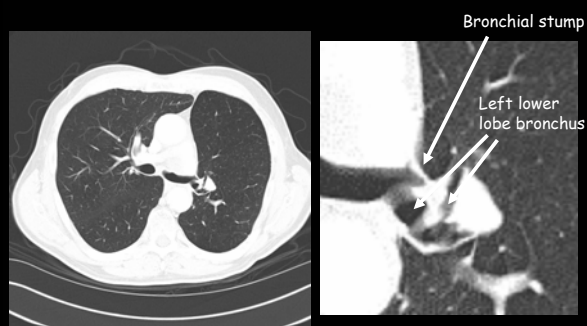
SIST lobectomy

A "large wedge resection"?



Anatomic lobectomy

A complete lobectomy

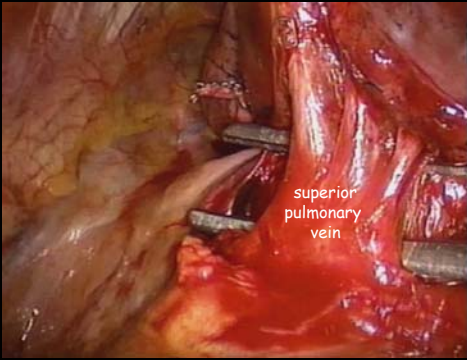


Anatomic VATS lobectomy

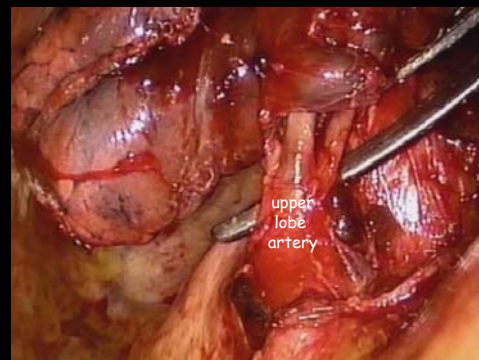
Development of instrumentation



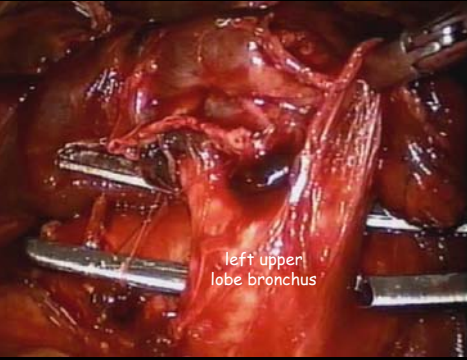
Anatomic VATS lobectomy



Anatomic VATS lobectomy

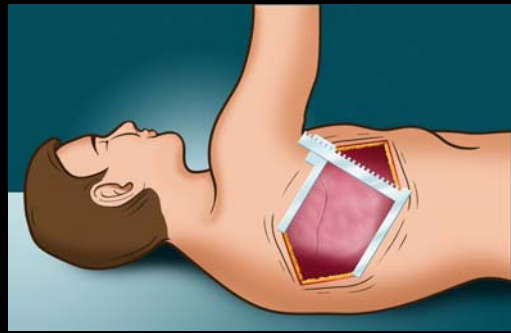


Anatomic VATS lobectomy



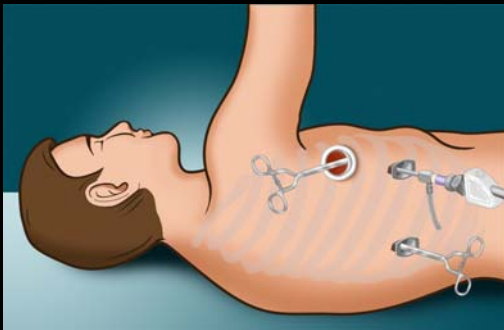
Anatomic lobectomy

1990



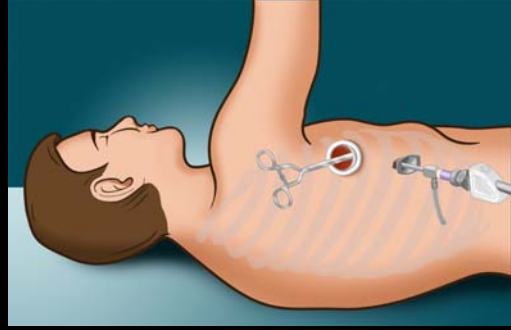
Anatomic lobectomy

2000



Anatomic lobectomy

2010



Anatomic lobectomy

2010



Anatomic lobectomy

2010



Anatomic lobectomy

2010



Anatomic lobectomy

2010



Anatomic VATS lobectomy

Advantages over thoracotomy

- Less postoperative pain
- Shorter length of stay
- Fewer complications
- Less cytokine response
- Faster back to work
- Easier to give adjuvant therapy
- Reduced cost

Anatomic VATS lobectomy

Underutilized?

Less than 25% of lobectomies in the U.S. for stage 1 disease are performed via VATS

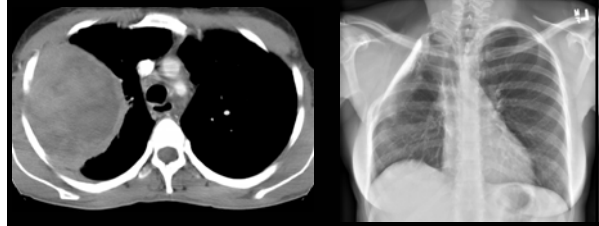
Beware of non-anatomic lobectomy (SIST lobectomy)

Anatomic VATS lobectomy

Which patients?

- All stage 1 tumors
- Decision to perform VATS for locally advanced disease is made on an individualized basis

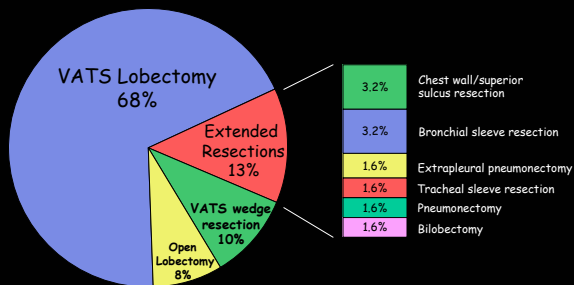
T3 chest wall



Not a good VATS candidate

The Valley Hospital

Primary malignancies of the lung, pleura and trachea undergoing resection in 2009



Anatomic VATS lobectomy

The future

- CALGB 140503: LCSG 821 revisited
 - Perhaps lobectomy is overkill for many small lung cancers detected today
- Robotics: Technology evolving
 - Presently unable to perform dissection through a single port