The Role of Surgery in Lung Neoplasms

"Great news, Mr. Hopwood. We got it all!"
The Role of Surgery in Lung Neoplasms

- Carcinoid
- Non-Small cell lung cancer
  - Adenocarcinoma,
  - Squamous
  - Large cell/Neurendocrine
- Small Cell Lung Cancer
The Role of Surgery in Lung Neoplasms: Carcinoid

• Carcinoid
  – Primary Parenchymal
  – Endobronchial

Lung Preserving Techniques:

Sleeve Resection/ Bronchial only resection/
?Endobronchial
Atypical vs Typical/ lobectomy vs sublobar

Therapeutic Lymph Node Dissection
Advances in the Treatment of NSCLC Lung Cancer

- Staging systems and staging technology
- Minimally invasive lung cancer surgery
- Adjuvant chemotherapy
- Alternate local therapies
- Lung Cancer Screening
LUNG CANCER TREATMENT STRATEGIES

EARLY DETECTION

BETTER STAGING

CHEMO-RADIO THERAPY ADVANCES

BIOLOGIC AGENTS

Minimally Invasive Resection
# The Role of Surgery in Lung Neoplasms

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<th>Occult Carcinoma</th>
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International Association for the Study of Lung Cancer/American Thoracic Society/European Respiratory Society International Multidisciplinary Classification of Lung Adenocarcinoma

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**TABLE 1. IASLC/ATS/ERS Classification of Lung Adenocarcinoma in Resection Specimens**

- **Preinvasive lesions**
  - Atypical adenomatous hyperplasia
  - Adenocarcinoma in situ (≤3 cm formerly BAC)
    - Nonmucinous
    - Mucinous
    - Mixed mucinous/nonmucinous
  - Minimally invasive adenocarcinoma (≤3 cm lepidic predominant tumor with ≤5 mm invasion)
    - Nonmucinous
    - Mucinous
    - Mixed mucinous/nonmucinous
- **Invasive adenocarcinoma**
  - Lepidic predominant (formerly nonmucinous BAC pattern, with >5 mm invasion)
  - Acinar predominant
Stage Specific Treatment of Non-Small Cell Lung Cancer

• Non Small Cell Lung Cancer: Stage 1 and 2
  – Lobectomy/and TLND is the primary treatment for non-small lung cancer
  – Sublobar resection..?
SURGICAL TREATMENT

• STAGE I, II
  – LOBECTOMY + MEDIASTINAL LYMPH NODE DISSECTION
  – Minimally Invasive VATS or RATS RESECTION
    • LOBECTOMY + MLND
VATS LOBECTOMY
TRANSITION FROM OPEN

SAME ONCOLOGIC OPERATION

SAME ANATOMIC OPERATION

DO NOT COMPROMISE
Incisions

Two Incision

Three Incision

Shari L. Meyerson, MD
University of Arizona
Arizona Cancer Center
VATS Lobectomy for Early Stage Lung Cancer

Movie
Minimally Invasive Lobectomy is now the Standard of Care For Early Stage Lung Cancer

Proven
Identical to Improved Survival
Improved LOS/Decreased Pain/Faster Recovery
Ability to Operate on High Risk PFT and Elderly
Reproducible/Easily Taught
Decreased Cost

A MAJOR ADVANCE IN THE CARE OF THORACIC PATIENTS
Minimally Invasive Pulmonary Resection for Lung Cancer

- Wedge
- Segmentectomy
- Lobectomy
- Chest wall resection
- Sleeve resection
Controversies in NSCLC
Is less More?
Lobar vs Sublobar Resection

Curiosity killed the cat.
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)

- Multiinstituional Prospective-Randomized
- Segmental, lobar, mediastinal node path No
- Anatomic Segment and wedge with min 2 cm margin
- 75% Increase in local Recurrence.
- Loco regional recurrence rate tripled for subloabor:
  - No significant difference in overall PFT

Ann Thorac Surg 1995;60:615-623
BIOLOGY MATTERS: OCCULT N2 SUBCARINAL DISEASE
Invasive size is an independent predictor of survival in pulmonary adenocarcinoma

Alain C. Borczuk, MD, Fang Qian, MD, Angeliki Kazeros, MD, Jennifer Eleazar, MD, Adel Assaad, MD, Joshua R Sonett, MD, Mark Ginsburg, MD, Lyall Gorenstein, MD, and Charles A Powell, MD

Invasion of >6mm is independent predictor of lymph nodes
And survival vs. of overall size

<5mm invasion

>6mm invasion
Survival after lobectomy versus segmentectomy for stage I non-small cell lung cancer: a population-based analysis
Whitson B, Groth S, Andrade R, Maddaus M, Habermann E, D’Cunha J.


Retrospective Review of Real World SEER Data Base (1998-2007)
Lobectomy vs. Anatomic Sementectomy
14, 473 patients (13,892 lobe vs. 581 Seg)
Survival after lobectomy versus segmentectomy for stage I non-small cell lung cancer: a population-based analysis

Whitson B, Groth S, Andrade R, Maddaus M, Habermann E, D’Cunha J
Technical Issues in the sublobar debate and the real world
Lobar vs Sublobar Resection
“Lets get Personal”

Risk of Patient
Risk / Benefit of Procedure
Risk of Tumor Biology
  Size
  Location/location/location
  Invasiveness
  Nodes
  ?SUV
  ?Molecular Signiture
Lung Cancer Treatment
PARADIGM SHIFT

Stage IB (≤ 70), IIA, IIB
3-4 cm
N1 nodes

ADJUVANT CHEMOTHERAPY
Surgical Treatment of Locally Advanced NSCLC

- Stage IIIA
  - N2 Nodes
  - Local Invasion T3(N1) or T4 (spine, aorta, pancoast)
SURGICAL TREATMENT
STAGE IIIA (N2)

? BENEFIT OF NEOADJUVANT THERAPY

• CHEMOTHERAPY
• RADIATION THERAPY
• SURGICAL RESECTION
  – RESECTION FOLLOWING 60GY INDUCTION
STAGE IIIA NEOADJUVANT INDUCTION OPTIONS IN EVOLUTION

• ? OPTIMIZING INDUCTION
  – RESECTION AFTER CURATIVE INTENT MEDICAL THERAPY

• ? NEO-NEOADJUVANT THERAPY

• ? CONSOLIDATION

• ? BIOLOGIC THERAPY
Concurrent vs. Sequential Chemoradiotherapy

Survival rate (%)

No. of Patients Alive
Concurrent 156 100 54 34 25 11
Sequential 158 86 43 23 16 7

P = .03998
SURGICAL TREATMENT
STAGE IIIA (N2)

Surgical therapy after Induction Therapy
– Nodal Sterilization best prognosticator of surv.
– Optimize nodal sterilization
  • Sonett et al. 87% nodal sterilization with concurrent chemo/xry >60gy
Induction Chemo/Radiotherapy
Full dose Radiation (>60GY): Sonett et al
Conclusions: Stage III Disease

- Concurrent chemoradiotherapy is superior to sequential treatment.
- Optimal Neoadjuvant Protocol Unclear.
- ?CONSOLIDATION
- ?BIOLOGIC THERAPY
- The role of surgery in Stage III Remains to be clearly defined.
ADVANCED SURGICAL TECHNIQUES

- HIGH RISK PATIENTS
  - LESSONS FROM LUNG VOLUME REDUCTION
  - WEDGE RESECTION
    - Lobectomy versus Wedge
    - LCSG: Ginsburg et al.
A Randomized Trial Comparing Lung-Volume–Reduction Surgery with Medical Therapy for Severe Emphysema

National Emphysema Treatment Trial Research Group

ABSTRACT

BACKGROUND
Lung-volume–reduction surgery has been proposed as a palliative treatment for severe emphysema. Effects on mortality, the magnitude and durability of benefits, and criteria for the selection of patients have not been established.
THORACOSCOPIC LUNG VOLUME REDUCTION SURGERY
SURGICAL TREATMENT

• STAGE IIIB / IV

• PALLIATIVE THERAPY
  – ENDOBRONCHIAL STENTS
  – ENDOBRONCHIAL BRACHYTHERAPY
  – ENDOBRONCHIAL PHOTODYNAMIC TX
  – MANAGEMENT OF PLEURAL EFFUSIONS
    • PLEURX CATHETER
ADVANCED SURGICAL TREATMENT

• STAGE IV:

ISOLATED BRAIN METASTASIS
  • CURATIVE RESECTION OR GAMMA KNIFE FOLLOWED BY WHOLE BRAIN RADIATION.
  • STAGE SPECIFIC TREATMENT OF LUNG CARCINOMA
  • 20-30 % LONG TERM SURVIVAL

ISOLATED ADRENAL METASTASES
  • ADRENALECTOMY
Surgery In NSCLC

Summary

• Surgical Resection for Early Stage by Minimally Invasive Lobectomy
• Consider Adjuvant/Oncology consult
• Locally Advance Disease
  • Induction Therapy then consider resection
Thanks