Lobectomy x Subsegmental Resection

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Conflict of Interest

• Speaker of Johnson & Johnson since 2010
Lung cancer has the highest incidence and mortality rates of any major cancer worldwide.

Adenocarcinoma is the most common histologic subtype of NSCLC.

Widely divergent clinical, radiological, molecular and pathologic spectrum.

Rapid evolving molecular advances.

BAC terminology is confusing.
Lobectomy x Subsegmental Resection

IASLC/ATS/ERS Adenocarcinoma Classification

- Preinvasive lesions
  - Atypical Adenomatous Hyperplasia (AAH)
  - Adenocarcinoma in situ (AIS, ≤3 cm)
    - Non-mucinous
    - Mucinous
- Minimally Invasive Adenocarcinoma (MIA, ≤3 cm)
  - Lepidic predominant tumor with ≤ 5 mm invasion
- Invasive adenocarcinoma
  - Lepidic pattern predominant
  - Acinar pattern predominant
  - Papillary pattern predominant
  - Micropapillary pattern predominant
  - Solid pattern predominant
Survival according to cell type: Histology Matters
Recurrence-Free Survival by IASLC Histologic Type in Stage I Adenocarcinoma

<table>
<thead>
<tr>
<th>Histologic Type (n)</th>
<th>5-Yr RFS (%)</th>
</tr>
</thead>
<tbody>
<tr>
<td>AIS (1) and MIA (8)</td>
<td>100</td>
</tr>
<tr>
<td>Lepidic NM (29)</td>
<td>90</td>
</tr>
<tr>
<td>Papillary (143)</td>
<td>83</td>
</tr>
<tr>
<td>Acinar (232)</td>
<td>85</td>
</tr>
<tr>
<td>Mucinous ADC (13)</td>
<td>76</td>
</tr>
<tr>
<td>Colloid (9)</td>
<td>71</td>
</tr>
<tr>
<td>Solid (67)</td>
<td>71</td>
</tr>
<tr>
<td>Micropapillary (12)</td>
<td>64</td>
</tr>
</tbody>
</table>

\[ P = 0.003 \]
New IASLC/ATS/ERS Classification and Invasive Tumor Size are Predictive of Disease Recurrence in Stage I Lung Adenocarcinoma

Naoki Yanagawa, MD, PhD,* Satoshi Shiono, MD, PhD,† Masami Abiko, MD, PhD,† Shin-ya Ogata, MD, PhD,* Toru Sato, MD, PhD,† and Gen Tamura, MD, PhD*

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FIGURE 4. DFS of all the patients. The 5-year DFS of AIS and MIA was 100%; lepidic-predominant, 94.9%; papillary predominant, 85.4%; acinar-predominant, 89.7%; solid-predominant, 54%. The predominant growth pattern was significantly correlated with DFS ($p < 0.001$, overall).
Lobectomy x Subsegmental Resection

So, histology matters to define surgical approach and predicts prognosis!!
Lobectomy x Subsegmental Resection

- Pathology ✓
- So what about clinical staging?
  - Clinical Staging defines surgical management
  - Lobectomy standard of treatment for early stage NSCLC
Lobectomy x Subsegmental Resection

- Inferior disease-free survival of limited resection vs lobectomy (LCSG, 1995)

- Indications
  - High surgical risk pts
  - Advanced COPD with lower lobe tumor
  - Previous resections
Lobectomy x Subsegmental Resection

• Potential advantages of segmentectomy
  o Preservation of pulmonary function compared to lobectomy
  o Improved oncologic outcomes compared to wedge resection

• Can it be the standard of care for early stage adenocarcinoma?
T1a Peripheral Lung Lesions

Prosppective, single-center study
Goal: to establish an algorithm for the type of resection of small peripheral lesions using new indicators

N=179 (10/97-09/02)
- T1a ≤ 2 cm on HRCT
- Hilar, mediastinal LN≤1 cm (cN0)
- No organ dysfunction (cardiopulmonary or other)
- No active malignant lesions in other organs

<table>
<thead>
<tr>
<th>CLASSIFICATION</th>
<th>Observation</th>
<th>WWR, segmentectomy, VATS lobectomy</th>
</tr>
</thead>
<tbody>
<tr>
<td>≤10 mm, any opacity type</td>
<td>Observation</td>
<td>WWR, segmentectomy, VATS lobectomy</td>
</tr>
<tr>
<td>Any size, pure GGO</td>
<td>WWR, segmentectomy, VATS lobectomy</td>
<td>Segmentectomy and LN sampling</td>
</tr>
<tr>
<td>11-15 mm, GGO type</td>
<td>Segmentectomy and LN sampling</td>
<td>Segmentectomy and LN dissection</td>
</tr>
<tr>
<td>11-15 mm, solid type</td>
<td>Segmentectomy and LN dissection</td>
<td>Lobectomy and LN dissection</td>
</tr>
<tr>
<td>16-20 mm, GGO type</td>
<td>Lobectomy and LN dissection</td>
<td>Lobectomy and LN dissection</td>
</tr>
<tr>
<td>16-20 mm, solid type</td>
<td>Lobectomy and LN dissection</td>
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</tr>
</tbody>
</table>

VATS=video-assisted thoracic surgery; WWR: wide angle resection.
T1a Peripheral Lung Lesions

Disease-Free Survival

Overall Survival

5-year limited resection
Lobectomy

98%
74%

5-year limited resection
Lobectomy

97%
80%

Selection Criteria for Sublobar Resection: Prospective Trials Ongoing

**JCOG 0804**
- Ph II, single-arm trial (N = 334)
- Adenocarcinoma ≤ 2 cm
- GGO with < 25% solid component

Endpoint: Wedge resection

- Endpoint: RFS

**JCOG 0802**
- Ph III, randomized trial (N = 1,100)
- Adenocarcinoma ≤ 2 cm
- GGO with 25-100% solid component

Endpoint: Lobectomy

- Endpoint: OS
- Pulmonary function

- Limited, sublobar resection + LN drop out → lobectomy

**CALGB 140503**
- Ph III, non-inferiority trial (N = 1,300)
- Peripheral carcinoma ≤ 2 cm with negative hilar nodes
- Stratification: smoking, histology, tumor size

Endpoint: Lobectomy

- Endpoint: Primary: OS
- Secondary: DFS, pulmonary function

Sublobar resection (segmentectomy/wedge)

GGO=Ground-Glass Opacity
Lobectomy x Subsegmental Resection

- Pathology ✓
- So what about staging? ✓
  - Clinical Staging defines surgical management
  - Lobectomy standard of treatment
- Surgical technique
  - What have we done to improve results?
Lobectomy x Subsegmental Resection

- May be applied to a spectrum of conditions
- Requires training
- All common segmental resections are feasible
- Similar outcomes: OR time, blood loss, mediastinal LN
- Oncologically comparable
Lobectomy x Subsegmental Resection

• NCCN guidelines:
  • Lobectomy is preferred over limited resection, and segmentectomy is preferred over wedge resection

• Segmentectomy may be considered in selected patients with tumors <2cm
  o Tumor type (AIS, MIA)
  o Age/Performance status
  o Pulmonary function
Lobectomy x Subsegmental Resection

• Conclusions:
  o cT1aN0 – NOT Homogeneous disease
  o Good candidates for limited resection
    • AIS and MIA
    • >50% GGO
    • Peripheral tumors
    • No LN involvement
Lobectomy x Subsegmental Resection

- Improvements in screening, pathology, clinical staging and surgical technique have allowed a shift in the management of patients with early stage lung cancer.