Pre-operative and Operative Choices for Elderly Lung Cancer Patients

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Lung Cancer in the Elderly is a Very Common Problem

- Life expectancy US: 77.8 years
- Median age of lung cancer: 71 years in US
- Preserved function of many elderly
- 2nd most common diagnosed, most lethal
- 2008: 215,020 Americans diagnosed
  161,840 Americans lung CA deaths
Surgical Decisions in The Elderly Are Not Straightforward

- Most lung nodules are cancer: 2 cm SPN in an 80-year old female smoker has > 70% probability of cancer in US and Europe.
- Untreated Lung CA short life expectancy
- Early stage is common, so surgery can cure
- **But:** Higher surgical morbidity and mortality (death in 1 month?)
- **First choice:** Should you even tell the patient?
Medical Paternalism

- Don’t tell
- No treatment possible
- Protect the (childlike?) elderly
- Family may request

**BUT:**
- Deprive choices
- Future plans / treatment
- No chance to avoid symptoms

Natural History of Lung Cancer is Dismal

- Short life expectancy: 9 to 18 months, with 1 to 3 months of suffering.
- Hemoptysis, malignant pleural effusion, malignant pericardial effusion, airway obstruction,
- Brain mets, painful boney mets
Competing Influences

- Life expectancy exceeds natural history of lung cancer.
- Everyone has a 50% probability of 5 to 15 years, with preserved function for most of that time.
- What is not known is average years of independence remaining.

### AVERAGE YEARS OF LIFE REMAINING

<table>
<thead>
<tr>
<th>Age (yr)</th>
<th>White</th>
<th>Black</th>
<th>White</th>
<th>Black</th>
</tr>
</thead>
<tbody>
<tr>
<td>65-70</td>
<td>15</td>
<td>13</td>
<td>19</td>
<td>17</td>
</tr>
<tr>
<td>70-75</td>
<td>12</td>
<td>11</td>
<td>15</td>
<td>14</td>
</tr>
<tr>
<td>75-80</td>
<td>9</td>
<td>9</td>
<td>12</td>
<td>11</td>
</tr>
<tr>
<td>80-85</td>
<td>7</td>
<td>7</td>
<td>9</td>
<td>8</td>
</tr>
<tr>
<td>≥ 85</td>
<td>5</td>
<td>6</td>
<td>6</td>
<td>7</td>
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</tbody>
</table>
Worst Case Scenario

• Patient is not told
• Lung cancer death rarely peaceful
• Symptoms develop – Emergency visit
• Another physician reveals it is likely lung cancer AND nodule was seen months ago!

• Now suffering, mistrust, and anger
Worst Case Avoided by Conversation with Patient

- There is an abnormality on your chest x-ray. Do you want to see it?

- I think there is a good chance this is a lung cancer.

- Do you have symptoms of...?
Elderly Patients WANT to know if Cancer is Diagnosis

- Survey of 270 patients ≥ 65 years old
- 88% want as much information as possible
- 1% undecided
- 11% preferred not to know information
- Limited ambulation: 28% preferred NOT to know

Ajaj, BMJ 2001
Let The Patient Decide

• Inform

• Offer choices of:
  – Do nothing
  – Work-up
  – Meet experts

• No loss of trust

• If no treatment now, early symptoms lead to early palliation*

*Surgery
Individualize Functional Status and Stage to Make Decisions

- History and Physical
- Geriatric Assessment
- CT / Head scan, possible PET scan
- Discuss wishes / bias of patient and family
- Possible pre-resection surgical staging
Radiographic Stage IV

- In general, prove it.

- Lifelong exposure to other causes of radiographic findings

- Biopsies can be tested for EGFR mutations, other maintenance strategies
Radiographic Stage III

- In general, prove it.
- Lifelong exposure to other causes of adenopathy
- Stage IIIA multi-modality treatment success may be age / functional status related.
- Harshness of treatment
Stage I and II NSCLC in Elderly Patients

- Offer choices:
  - Do nothing, but watch and wait
  - Full workup and possible resection
  - Diagnosis, and locally ablative therapies
  - Diagnosis and radiotherapy
  - Diagnosis alone

- Initial interview with family: altered expectations, recent history

- May require multiple interviews
Expectations

- Long incisions
- Painful
- Will never return home
Thoracoscopy Reduces Risk

- Overall mortality < 1%
- 2% mortality if FEV-1 < 1 liter
- 10% mortality if Karnofsky scale < 8 (unable to carry on normal activity)

Jaklitsch.. Chest 1996 (110):751-8
# Age Used to be a Risk Factor For Death After Thoracotomy

**Lung Cancer Study Group (LCSG)** 1983 data on open lobectomy or less:

<table>
<thead>
<tr>
<th>Age Group</th>
<th>Cases/Total</th>
<th>Rate (%)</th>
</tr>
</thead>
<tbody>
<tr>
<td>≥ 70 years</td>
<td>27/368</td>
<td>7.3%</td>
</tr>
<tr>
<td>≥ 80 years</td>
<td>3/27</td>
<td>11%</td>
</tr>
</tbody>
</table>

**Brigham VATS** 1993-96:

<table>
<thead>
<tr>
<th>Procedure</th>
<th>Cases/Total</th>
<th>Rate (%)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Lobectomy or segmentectomy</td>
<td>0/32</td>
<td>≥ 70 years</td>
</tr>
<tr>
<td>Lesser resections</td>
<td>1/156</td>
<td>≥ 70 years</td>
</tr>
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</table>

**ACOSOG Z0030** 1999-2004:

<table>
<thead>
<tr>
<th>Age Group</th>
<th>Cases/Total</th>
<th>Rate (%)</th>
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</thead>
<tbody>
<tr>
<td>70-79 years</td>
<td>8/361 (2.2%)</td>
<td></td>
</tr>
<tr>
<td>≥ 80 years</td>
<td>2/70 (2.9%)</td>
<td></td>
</tr>
</tbody>
</table>

Ginsberg, et al, JTCVS, 1983  
Risks Related to Magnitude of Muscle Divided and Lung Resected

- Pneumonectomy
- Lobectomy
- Segmentectomy
- Wedge
- Needle Bx and XRT
- RFA or cryoablation

Segmental Resections (N1)

Locally Ablative (No nodes)

Thoracotomy Versus VATS
Surgeon’s Choice of Resection

• Lobectomy:
  May have up to 10% mortality in elderly
  Higher morbidity
  Very low recurrence rate (6%)

• Thoracosscopic Wedge:
  Less than 1% mortality rate, even in elderly
  Less morbidity
  May have a 17% local recurrence rate
% Surviving

- Lobectomy
- Limited Resection

log rank p=0.088 (one-tailed)

Number at Risk

<table>
<thead>
<tr>
<th></th>
<th>Lobectomy:</th>
<th>Ltd. Resect.:</th>
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<tbody>
<tr>
<td></td>
<td>90</td>
<td>93</td>
</tr>
<tr>
<td>12</td>
<td>47</td>
<td>43</td>
</tr>
<tr>
<td>24</td>
<td>47</td>
<td>43</td>
</tr>
<tr>
<td>36</td>
<td>47</td>
<td>43</td>
</tr>
<tr>
<td>48</td>
<td>22</td>
<td>11</td>
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</tbody>
</table>

Time in Months

[Graph showing survival rates over time for Lobectomy and Limited Resection with number at risk at each time point]
Elderly Stage I NSCLC
Surgical Resections at BWH

- 1134 SPNs wedged at BWH (1989-98)
- 563 were proven NSCLC
- 98 were ≥ 75 yrs (elderly), 465 were <75 yrs
- Surgeon’s choice to proceed with anatomic lung resection or treat with wedge alone

Jaklitsch, Proc ASCO 1999:18;471a
Surgical Treatment by Wedge Resection Increases with Age

Percent

Age

% Wedge
% Lobectomy

< 65 65 - 69 70 - 74 75 - 79 > 79
14 17 26 36 63

P = 0.03 P = 0.0007 P = 0.0001
Survival for Elderly NSCLC Patients

Median follow-up 15 months
1) Elderly patients (>75 yrs) are more likely to receive a wedge resection as definitive surgical therapy for Stage I NSCLC than younger patients at BWH, irrespective of performance status or comorbid lung disease.

2) Long-term survival in the elderly patients selected for surgical treatment of Stage I NSCLC appears to not be affected by surgeon’s choice of wedge versus lobectomy.

Jaklitsch, Proc ASCO 1999:18;471a
## SEER Lung CA Stats

<table>
<thead>
<tr>
<th></th>
<th>&lt; 65 yrs</th>
<th>65 - 74 yrs</th>
<th>≥75 yrs</th>
<th>P</th>
</tr>
</thead>
<tbody>
<tr>
<td>(n=5057)</td>
<td>(n=6073)</td>
<td>(n=3425)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Males, %</td>
<td>55</td>
<td>57</td>
<td>54</td>
<td>0.0062</td>
</tr>
<tr>
<td>Stage I, %</td>
<td>79</td>
<td>83</td>
<td>87</td>
<td>&lt;0.0001</td>
</tr>
<tr>
<td>Histology, %</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Squamous</td>
<td>26</td>
<td>35</td>
<td>35</td>
<td>&lt;0.0001</td>
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<tr>
<td>AdenoCa</td>
<td>58</td>
<td>50</td>
<td>46</td>
<td></td>
</tr>
<tr>
<td>Large Cell</td>
<td>8</td>
<td>7</td>
<td>7</td>
<td></td>
</tr>
<tr>
<td>Adenosq</td>
<td>3</td>
<td>3</td>
<td>3</td>
<td></td>
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<tr>
<td>Others</td>
<td>0.6</td>
<td>0.2</td>
<td>0.3</td>
<td></td>
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<tr>
<td>Unknown</td>
<td>4</td>
<td>5</td>
<td>9</td>
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Curative surgery

<table>
<thead>
<tr>
<th>Age (yrs)</th>
<th>Curative surgery</th>
<th>No curative surgery</th>
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<tbody>
<tr>
<td>&lt;65</td>
<td>92%</td>
<td></td>
</tr>
<tr>
<td>65-74</td>
<td>86%</td>
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</tr>
<tr>
<td>&gt;75</td>
<td>70%</td>
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</tbody>
</table>

p<0.0001
Type of curative surgery

<table>
<thead>
<tr>
<th>Age (yrs)</th>
<th>Lobectomies</th>
<th>Pneumonectomies</th>
<th>Limited resections</th>
</tr>
</thead>
<tbody>
<tr>
<td>&lt;65</td>
<td>100%</td>
<td>81%</td>
<td>81%</td>
</tr>
<tr>
<td>65-74</td>
<td>100%</td>
<td>81%</td>
<td>100%</td>
</tr>
<tr>
<td>&gt;75</td>
<td>100%</td>
<td>78%</td>
<td>100%</td>
</tr>
</tbody>
</table>

p<0.0001

Mery, Chest 2001;120:176S
Overall mortality
No curative surgery

Survival (mos)

< 65 yrs
65 – 74 yrs
≥ 75 yrs

p=0.0025
Overall mortality
65 - 74 yrs

Survival (mos)
Overall mortality

≥ 75 yrs

Lobectomies

Limited rsct

Survival (mos) p = NS

0 10 20 30 40 50 60 70 80

0 .2 .4 .6 .8 1

0 1 2 3 4 5 6 7 8
Thoracoscopic Guided RFA or Cryo-therapy

• General anesthesia

• Thoracoscopic inspection of pleural space and sampling of N1 nodes

• Ablative therapy may be better with atelectatic lung
Intraoperative RFA / Cryotherapy

- N = 10
- Age median 60 yrs (range 40 – 85 years)
- Average size 3 cm

Locally Ablative Therapies: Cryo

• 6 Lung CA, 4 mets
• Combined wedge and Cryo = 4
• No morbidity
• LOS 2 days
• 4 no re-growth in 13.5 months
• 5 re-growth starting 12.8 months

HM, DOB 6/17/24, 79 yo male with NSCLC of left lower lobe, treated with CT-guided RFA. Disease-free 5 years later.
Traditional Outcome Measures Are Not Really Helpful

- Morbidity, mortality
- Disease-free Survival
- Recurrence

We Need Measures of:
- Loss of independence
- Time to return home
- Functional impairment
- Nursing home risk
Collaborations

• Risk Assessment for Invasive Procedures

• Competitive Outcomes: Longer impaired life or shorter quality life

• Working together, Can we turn lung cancer into a chronic disease?
Winter Sunset on Commonwealth Avenue