RT Patterns of Care in Early Stage Non-small-cell Lung Cancer in Sydney, NSW

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Introduction

- For inoperable patients with stage I and II NSCLC, guidelines recommend curative RT.
- Variation in treatment is seen between counties:
  - 56-75% use of curative treatment rate
  - 32-57% use of curative RT in inoperable stage I & II NSCLC
- Stereotactic ablative body radiotherapy (SABR) is a newer method of RT delivery:
  - Suitability depends on size and location.
Introduction

- To document RT patterns of care for early stage NSCLC across 3 institutions

- To evaluate reasons for palliative Rx rather than curative RT for early stage NSCLC

- To identify the proportion of patients who would be suitable for SABR
Methods

Retrospective audit of 3 Oncology Cancer Centres in 4 public hospitals in NSW

Inclusion criteria:
- Stage I or II NSCLC
- Were seen in a radiation oncology clinic from 2008 to 2014
- Did not receive surgery

Data collected:
- Patient demographics, medical history
- Tumour characteristics, treatment
- Reasons for non-curative treatment, outcomes
Methods

- **Suitability for SABR**
  - Based on RTOG 0915 criteria for non-central tumours
  - T1-2N0M0 NSCLC

- **Analysis performed:**
  - Univariate and multivariate logistic regression analyses - factors associated with curative RT
## Results: Study Population

<table>
<thead>
<tr>
<th>All n= 312</th>
<th>p</th>
</tr>
</thead>
<tbody>
<tr>
<td>Sex</td>
<td>0.477</td>
</tr>
<tr>
<td>Male</td>
<td>201 (64.4)</td>
</tr>
<tr>
<td>Female</td>
<td>111 (35.6)</td>
</tr>
<tr>
<td>Median Age (years)</td>
<td>77</td>
</tr>
<tr>
<td>Histology at diagnosis</td>
<td>&lt;0.0001</td>
</tr>
<tr>
<td>Adenocarcinoma</td>
<td>79 (25.3)</td>
</tr>
<tr>
<td>Squamous</td>
<td>116 (37.2)</td>
</tr>
<tr>
<td>Large cell</td>
<td>49 (15.7)</td>
</tr>
<tr>
<td>Other or NOS</td>
<td>18 (5.8)</td>
</tr>
<tr>
<td>Clinical diagnosis only</td>
<td>50 (16.0)</td>
</tr>
<tr>
<td>ECOG Performance Status</td>
<td>0.009</td>
</tr>
<tr>
<td>0-2</td>
<td>249 (79.8)</td>
</tr>
<tr>
<td>3-4</td>
<td>36 (11.5)</td>
</tr>
<tr>
<td>Unknown</td>
<td>27 (8.7)</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>All n= 312</th>
<th>p</th>
</tr>
</thead>
<tbody>
<tr>
<td>Stage</td>
<td>0.170</td>
</tr>
<tr>
<td>I</td>
<td>203 (65.1)</td>
</tr>
<tr>
<td>II</td>
<td>109 (34.9)</td>
</tr>
<tr>
<td>Simplified comorbidity score</td>
<td>0.041</td>
</tr>
<tr>
<td>≤ median(9)</td>
<td>182 (58.3)</td>
</tr>
<tr>
<td>&gt; median(9)</td>
<td>92 (29.5)</td>
</tr>
<tr>
<td>Unknown</td>
<td>38 (12.2)</td>
</tr>
<tr>
<td>Pulmonary comorbidity</td>
<td>&lt;0.0001</td>
</tr>
<tr>
<td>Yes</td>
<td>203 (67.2)</td>
</tr>
<tr>
<td>No</td>
<td>99 (32.8)</td>
</tr>
<tr>
<td>Unknown</td>
<td>10 (3.3)</td>
</tr>
</tbody>
</table>
Results: RT patterns of care in early stage NSCLC in Sydney
Results: Curative RT patterns of care

- St George (n=79)
- Prince of Wales (n=23)
- Liverpool/Macarthur (n=76)
- All (n=178)

Percentage

- Conventional
- Stereotactic
Results: Differences between two time periods

2008-2011:
- Curative RT: 24%
- Palliative RT: 25%
- No Treatment: 51%

2012-2014:
- Curative RT: 24%
- Palliative RT: 12%
- No Treatment: 64%

Legend:
- Curative RT
- Palliative RT
- No Treatment
Results: Reasons for palliative treatment

- Significant other disease: 21%
- Significant CVD: 12%
- Performance status: 10%
- Patient preference: 11%
- Other: 20%
- COPD/Poor Pulmonary Function: 26%
Results: Factors associated with curative radiotherapy use

Factors associated with curative RT:
- Type of diagnosis (p=0.031)
- SCS (p=0.003)
- ECOG performance status (p=0.016)
- FEV1% (p=0.040)
- Institution (p=0.000)
- Time period (p=0.016)
Results: Suitability for SABR

<table>
<thead>
<tr>
<th>Treatment Type</th>
<th>Yes</th>
<th>No</th>
<th>Unknown</th>
</tr>
</thead>
<tbody>
<tr>
<td>Conventional RT (n=79)</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Palliative RT (n=34)</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>No Treatment (n=61)</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Author, Year (Country)</td>
<td>Period</td>
<td>n</td>
<td>Stages (%Stage I-II)</td>
</tr>
<tr>
<td>-----------------------</td>
<td>--------</td>
<td>------</td>
<td>----------------------</td>
</tr>
<tr>
<td>Koshy, 2015 (USA)</td>
<td>2003-2011</td>
<td>39822</td>
<td>I (inoperable)</td>
</tr>
<tr>
<td>Smith, 2011 (Canada)</td>
<td>1996-2005</td>
<td>1043</td>
<td>I-II (inoperable)</td>
</tr>
<tr>
<td>Duggan, 2011 (AUS)</td>
<td>2006-2008</td>
<td>815</td>
<td>I-IV (13%)</td>
</tr>
<tr>
<td>Vinod, 2010 (AUS)</td>
<td>2001-2002</td>
<td>1812</td>
<td>I-IV (9%)</td>
</tr>
<tr>
<td>Stevens, 2007 (NZ)</td>
<td>2004</td>
<td>565</td>
<td>I-IV (25%)</td>
</tr>
<tr>
<td>Wisnivesky, 2005 (USA)</td>
<td>1988-2001</td>
<td>4357</td>
<td>I-II (inoperable)</td>
</tr>
<tr>
<td>Potosky, 2004 (USA)</td>
<td>1996</td>
<td>898</td>
<td>I-IV (27%)</td>
</tr>
<tr>
<td>De Rijke, 2004 (Netherlands)</td>
<td>1997-1998</td>
<td>803</td>
<td>I-IV (27%)</td>
</tr>
<tr>
<td>Valle, 2015 (USA)</td>
<td>2007-2011</td>
<td>1506</td>
<td>I (NR)</td>
</tr>
<tr>
<td>Tjulandin, 2015 (Russia)</td>
<td>2010-2011</td>
<td>838</td>
<td>I-IV (37%)</td>
</tr>
<tr>
<td>Barni, 2015 (Italy)</td>
<td>2011-2012</td>
<td>708</td>
<td>I-IV (19%)</td>
</tr>
<tr>
<td>Carrato, 2014 (Europe)</td>
<td>2009</td>
<td>3508</td>
<td>I-IV (16%)</td>
</tr>
<tr>
<td>Boxer, 2015 (AUS)</td>
<td>2005-2010</td>
<td>808</td>
<td>I-IV (15%)</td>
</tr>
<tr>
<td>Current study</td>
<td>2008-2014</td>
<td>312</td>
<td>I-II (inoperable)</td>
</tr>
</tbody>
</table>
Discussion

- Treating institution significantly associated with use of curative RT after controlling for other factors
  - Clinician judgement/ clinician bias?
- Patient factors were main reason for palliative Rx
- Significant proportion of patients who underwent palliative or no RT were suitable for SABR
- Introduction of SABR changed RT practice but did not increase RT use in patients not having any Rx
Conclusion

- Institutional variation in use of curative RT
- Patient factors were the main reason for palliative Rx
- Notable proportion of patients treated with palliative intent were suitable for SABR