News Briefing: Treatment Considerations for Focused Populations
Moderator: Pranshu Mohindra, MD, University of Maryland, Baltimore

- **Reirradiation of Thoracic Cancers with Intensity Modulated Proton Therapy**
  Jennifer Ho, MD, MD Anderson Cancer Center

- **Stereotactic Body Radiotherapy for Early Stage Non-Small Cell Lung Cancer in Patients 80 Years and Older: A Multi-Center Analysis**
  Richard J. Cassidy III, MD, Winship Cancer Institute, Emory University

- **Racial Disparities in the Treatment & Outcome of Stage I Non-Small Cell Lung Cancer**
  Andrew Farach, MD, Houston Methodist Hospital
Reirradiation of Thoracic Cancers with Intensity Modulated Proton Therapy

J. C. Ho\textsuperscript{1}, Q. N. Nguyen\textsuperscript{1}, H. Li\textsuperscript{2}, P. K. Allen\textsuperscript{1}, X. Zhang\textsuperscript{2}, X. R. Zhu\textsuperscript{2}, D. R. Gomez\textsuperscript{1}, S. H. Lin\textsuperscript{1}, M. T. Gillin\textsuperscript{2}, R. U. Komaki\textsuperscript{1}, Z. Liao\textsuperscript{1}, S. M. Hahn\textsuperscript{1}, and J. Y. Chang\textsuperscript{1}

\textsuperscript{1}Department of Radiation Oncology, The University of Texas MD Anderson Cancer Center, Houston, TX, \textsuperscript{2}Department of Radiation Physics, The University of Texas MD Anderson Cancer Center, Houston, TX
Background

- Challenges in treating recurrent lung cancer
  - Many patients are not candidates for surgery
  - Reirradiation: concerns about cumulative radiation doses to critical organs limit use of higher radiation dose
    - Older techniques resulted in up to 30% serious toxicity

⇒ Patients generally offered only palliative, lower doses of reirradiation
Background

- Proton radiation decreases radiation dose and toxicity to normal tissue, compared to traditional photon radiation
- 2 types of proton radiation: passive (older) and intensity modulated proton therapy, IMPT (newer)
- IMPT can precisely target the tumor and spare nearby normal tissue, to safely deliver a higher, curative radiation dose
Method

• Retrospective review of 27 patients treated at MD Anderson Cancer Center from 2011 - 2016

• IMPT for reirradiation of thoracic malignancies, with definitive intent
  • 81% had non-small cell lung cancer
  • 81% had centrally located tumors
  • Median 29.5 months from initial radiation to reirradiation

• Median reirradiation dose 66 Gy

• Median follow-up all patients 11.2 months (25.9 months for patients still alive)
Results

Overall Survival

- Median 18 m
- 1-year OS 54%

Progression Free Survival

- Median 19.3 m
- 1-year PFS 51%

Freedom from Local Failure

- Median NR
- 1-year 78%

Freedom from Locoregional Recurrence

- Median NR
- 1-year 61%
# Results (cont.)

## Impact of Reirradiation Dose

<table>
<thead>
<tr>
<th></th>
<th>Higher Dose ≥ 66 Gy</th>
<th>Lower Dose &lt; 66 Gy</th>
<th>p value</th>
</tr>
</thead>
<tbody>
<tr>
<td>1yr freedom from LF</td>
<td>100%</td>
<td>49%</td>
<td>0.013</td>
</tr>
<tr>
<td>Median freedom from LF</td>
<td>NR</td>
<td>9.1 m</td>
<td></td>
</tr>
<tr>
<td>1yr freedom from LRR</td>
<td>84%</td>
<td>23%</td>
<td>0.035</td>
</tr>
<tr>
<td>Median freedom from LRR</td>
<td>NR</td>
<td>6.8 m</td>
<td></td>
</tr>
<tr>
<td>1yr PFS</td>
<td>76%</td>
<td>14%</td>
<td>0.050</td>
</tr>
<tr>
<td>Median PFS</td>
<td>NR</td>
<td>6.8 m</td>
<td></td>
</tr>
<tr>
<td>1yr OS</td>
<td>62%</td>
<td>46%</td>
<td>0.289</td>
</tr>
<tr>
<td>Median OS</td>
<td>18.5</td>
<td>10.6</td>
<td></td>
</tr>
</tbody>
</table>

## Toxicity

<table>
<thead>
<tr>
<th>Type</th>
<th>Grade 1-2</th>
<th>Grade 3</th>
</tr>
</thead>
<tbody>
<tr>
<td>Pulmonary</td>
<td>19 (70%)</td>
<td>2 (7%)</td>
</tr>
<tr>
<td>Esophagitis</td>
<td>15 (56%)</td>
<td>0</td>
</tr>
<tr>
<td>Dermatitis</td>
<td>10 (37%)</td>
<td>0</td>
</tr>
<tr>
<td>Fatigue</td>
<td>23 (85%)</td>
<td>1 (4%)</td>
</tr>
<tr>
<td>Pain</td>
<td>10 (37%)</td>
<td>0</td>
</tr>
<tr>
<td>Hemoptysis</td>
<td>3 (11%)</td>
<td>0</td>
</tr>
</tbody>
</table>

- Minimal serious toxicity
- No grade 4 or 5 toxicities
Conclusions

• First report on IMPT for reirradiation of lung cancer
  • Outcomes improved compared to other reirradiation studies
  • Well tolerated, with minimal serious toxicity (7% vs. up to 30% in other studies)
  • Better local control (15% vs 35-40% failure) and survival (median 18 vs. 11-14 months)
  • Higher reirradiation doses (≥ 66 Gy) associated with improved outcomes

• IMPT appears to be the optimal choice for reirradiation:
  • To spare critical structures from the toxicity of cumulative radiation
  • To deliver curative reirradiation doses for challenging, central tumors
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Stereotactic Body Radiotherapy for Early Stage Non-Small Cell Lung Cancer in Patients 80 Years and Older: A Multi-Center Analysis


Departments of 1Radiation Oncology, 2Biostatistics and Bioinformatics, 3Medical Oncology and 4Thoracic Surgery of the 5Winship Cancer Institute, Emory University, Atlanta, GA
• Stereotactic body radiotherapy (SBRT) is the standard of care for medically inoperable early-stage non-small cell lung cancer (NSCLC)
  • Local control rates ≥ 90%

• Adoption of SBRT is rising and with an aging oncologic population, the treatment of patients ≥80 years old will be more common
  • Evolving literature, with varying definitions of elderly, about the utility of lung SBRT in older patients with early-stage NSCLC

• The current study was designed to investigate the efficacy, safety and survival of patients 80 years and older treated with definitive lung SBRT across a multi-site academic practice
Methods

• Retrospective chart and radiation therapy plan review from 2009 to 2015 for patients with early-stage NSCLC

  • Patients treated across four sites
    • Emory University Hospital, Emory University Hospital Midtown, Grady Memorial Hospital, St. Joseph’s Medical Center

  • Inclusion criteria
    • 80+ years old at diagnosis
    • Complete radiation planning records

• Of 300+ charts reviewed across all ages, 58 patients met entry criteria
Results

• Median follow up time of 19.9 months (6.9 - 64.9 months)

• Median age at time of SBRT was 84.9 years (80.1 – 95.2 years)

• Safety (grading based on Common Terminology Criteria for Adverse Events)
  • No grade 4/5 toxicities
  • Grade 3 radiation pneumonitis: 6.9%
  • Grade 3 chest wall pain: 3.4%
  • Grade 3 esophagitis: 1.7%
Results (cont.)

Kaplan Meier 2Y Estimates (95% CI)
- Local Control: 84.5% (65.3, 93.5%)
- Regional Control: 71.7% (54.1, 83.5%)
- Metastatic Control: 85.1% (68.5, 93.4%)
- Cause-Specific Survival: 72.6% (52.1, 85.4%)
- Overall Survival: 56.4% (37.6, 71.6%)
Results (cont.)

2Y Cause-Specific Survival
- KPS < 75: 67.2% (40.0%, 84.2%)
- KPS ≥ 75: 96.2% (75.7%, 99.4%)

2Y Overall Survival
- KPS < 75: 49.9% (29.0%, 67.6%)
- KPS ≥ 75: 91.1% (68.4%, 97.7%)
Conclusions

• Definitive lung SBRT in patients ≥80 years old appears to be safe and efficacious
  • Our population was relatively high risk, perhaps representing a “realistic” octo- or nonagenarian who would present in clinic
    • 51.7% had prior lung cancer; 19% had prior thoracic radiation; 12.1% were T3

• Suggestion of an even greater benefit in patients with higher baseline functional status
  • Karnofsky Performance Status = 70 is regarded as “caring for self, not capable of normal activity or work”
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Racial Disparities in the Treatment & Outcome of Stage I Non-Small Cell Lung Cancer

S. M. Dalwadi¹, G. Lewis², E. B. Butler³, B. S. Teh³, and A. M. Farach³

¹Texas A&M College of Medicine/Scott and White Memorial Hospital, Temple, TX, ²UTMB, Galveston, TX, ³Houston Methodist Hospital, Houston, TX
Background

• NSCLC is the most common and deadly malignancy in men and women combined

• One-fourth of NSCLC patients are diagnosed at an early and potentially curable stage

• Definitive treatment options for early stage NSCLC (Lobectomy, VATS, SBRT) have become more widely available and contributed to higher survival rates

• **Purpose:** To understand if racial disparities in the treatment and outcome of stage I NSCLC have diminished given the increased adoption of recent advancements in diagnosis and treatment
Methods

• N=62,213

• Population-based study (SEER 18)
  • Age 60+
  • Biopsy-proven stage I NSCLC (T1 or T2,N0)
  • 2004-2012
  • Excluding patients who lacked definitive data about treatment

• Race:
  • Caucasian (C)
  • African-American (AA)
  • American Indian (AI)
  • Asian/Pacific Islander (API)
  • Unknown/Other (U)

• Unavailable: chemotherapy, comorbidities, radiation modality/dose
Results

Key:
Surgery
Radiation
Both Surgery & Radiation
No Treatment

$p < 0.0001$
Survival by Race

Overall Survival

Cancer-Specific Survival

Median CSS:
- Overall: 107 mo
- Asian/Pacific Islander: >96 mo
- Caucasian: >96 mo
- African Americans: 80 mo
- American Indians: 49 mo
**Survival Analysis**

**Multivariate Analysis**

**Favorable**
- T1
- Younger Age
- Female Gender
- Definitive Treatment
- Asian / PI Race (HR 0.77)

**Unfavorable**
- T2
- Older Age
- Male Gender
- No treatment
- American Indian Race (HR 1.35)

**Survival differences for African Americans became insignificant when accounting for definitive therapy, despite a higher likelihood of male sex, T2, and younger age (HR 0.98)**
Conclusions

• Despite recent advancements, racial disparities in management and outcomes of NSCLC persist.

• Although the median CSS for African-American patients was more than two years shorter than the population median, the difference was no longer significant after controlling for patient, disease and treatment factors.

• American Indian populations require dedicated study.

• Improved access to care for minority groups may diminish racial impact on lung cancer outcomes.
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Online attendees: Please use the Question function to submit questions.
Additional questions and interview requests:

ASTRO’s On-site Press Office in San Francisco
Foothill F Room, San Francisco Marriott Marquis
March 16-17, 8am-4pm Pacific time
703-286-1600
press@astro.org

Slides and audio will be available following the briefing at www.astro.org/thoracicpress