Three-Year Experience of a Multidisciplinary Central Nervous System Clinic Model for Radiation Oncology and Neurosurgery (RADIANS) in a Community Hospital Setting

Wencesley Paez, MD1, Rohi Gheewala, BS2, Shearwood McClelland 3rd, MD3, Jerry Jaboin, MD, PhD1, Charles Thomas Jr, MD1, Timur Mitin, MD, PhD1, Jeremy Ciporen, MD2

1Department of Radiation Medicine, Oregon Health & Science University
2Department of Neurological Surgery, Oregon Health & Science University
3Department of Radiation Oncology, Indiana School of Medicine
Disclosures

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Introduction

- RADIANS multidisciplinary CNS clinic formed Fall of 2016
- Community Hospital Setting outside Portland, OR
  - patient-centric approach
  - optimize patient/physician time
  - simultaneous evaluation with radiation oncologist and neurosurgeon
- Medical Oncology (most common referral source)
- Patient Satisfaction Score = 4.77/5
- 140% Increase in Patient Volume in Last 12 Months
Methods

• IRB approved prospective patient registry developed Fall 2016
• Clinical and demographic data were collected, stored in secure database where only IRB-approved research team members had access, and reviewed over 3-year period (2016-2019)
• Patients referred into RADIANS clinic were seen simultaneously by both physicians, the radiation oncologist and neurosurgeon, in a single clinic visit setting
• Prior imaging and workup reviewed before the initial visit
• Discussion and Q&A regarding diagnosis and treatment options were done
• Family members and/or caregivers were included in discussion with consent of patient.
• Patient surveys given to all patients prior to the conclusion of their visit
Patient Characteristics (n=101)

- Mean Age = 61yrs; Med = 63yrs; Range = 20-94yrs
- Females (n=65, 64.4%); Males (n=36, 35.6%)
- Mean Distance Traveled = 54.9mi; Med=13.0mi; Range = 0.6-340mi
- KPS ≥ 80 = 81, 80.2%  (KPS ≤ 70 = 20, 19.8%)
- Co-Morbidities (one-two), n=49 (48.5%); (three-four), n=13 (12.8%)
- Two Most Common Co-Morbidities
  - COPD (n=27, 26.7%)
  - HTN (n=26, 25.7%)
- Obesity Class I (BMI = 30-34.9) = 20, 19.8%
- Obesity Class II (BMI ≥ 35.0) = 15, 14.8%
**Malignant**

- Breast: 25%, n=18
- Lung: 37%, n=27
- Kidney: 8%, n=6
- Multiple Myeloma: 4%, n=3
- Plasmacytoma: 3%, n=2
- Other: 10%, n=7
- GBM: 10%, n=7
- Malignant Brain = 9
- Malignant Spine = 2

**Benign**

- Meningioma: 55%, n=16
- Non-Tumoral CNS: 24%, n=7
- Myxopapillary Ependymoma: 3%, n=1
- Schwannoma: 7%, n=2
- Pituitary Adenoma: 4%, n=1
- Glioma: 7%, n=2
- Primary Brain = 18
- Primary Spine = 4

- Brain Mets = 28
- Spine Mets = 27
- Both = 6
Treatment Allocation

Radiation Therapy Received
- Stereotactic Radiosurgery/Body RT = 38/51, 75%
- Conventional Fractionated RT = 14/51, 27%
- Tumor Treating Fields* = 2/7, 28%
- 1 patient received WBRT and SBRT to the spine

Neurosurgery Performed
- Craniotomy with Tumor Resection = 28/38, 74%
- Separation Surgery¥ = 8/38, 21%
- Laminectomy/Laminotomy = 2/38, 5%

* 1 GBM patient received TTF; 1 GBM patient received Conventional RT + TTF
¥ Separation Surgery = spinal stabilization/fusion with maximal safe resection and decompression
## Treatment Outcomes

<table>
<thead>
<tr>
<th>Group</th>
<th>Description</th>
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<tbody>
<tr>
<td><strong>RT Only (n=29)</strong></td>
<td>• 9 pts followed-up by MedOnc or deceased prior to RADIANS follow-up</td>
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<td>• 20 pts with 3mo repeat imaging:</td>
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<tr>
<td></td>
<td>Radiation Necrosis = 0%, 0/20</td>
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<td></td>
<td>Local Control = 80%, 16/20</td>
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<tr>
<td></td>
<td>CNS Disease Progression = 55%, 11/20</td>
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<tr>
<td><strong>NS Only (n=16)</strong></td>
<td>• No neurologic deficits</td>
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<td>• Post-op complications = 6%, 1/16; [medically-related = 4/16]</td>
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<tr>
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<td>• At 3mo post-op repeat imaging:</td>
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<tr>
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<td>Local Control = 100%, 16/16</td>
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<tr>
<td></td>
<td>CNS Disease Progression = 6%, 1/16</td>
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<tr>
<td><strong>Both RT/NS (n=22)</strong></td>
<td>• Tumor resection followed by post-op RT to tumor cavity and unresected lesions</td>
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<tr>
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<td>• No neurologic deficits</td>
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<tr>
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<td>• Post-op complications = 14%, 3/22</td>
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<tr>
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<td>• At 3mo repeat imagining:</td>
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<tr>
<td></td>
<td>Radiation Necrosis = 4%, 1/22</td>
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<tr>
<td></td>
<td>Radiation Myelitis = 4%, 1/22</td>
</tr>
<tr>
<td></td>
<td>Local Control = 91%, 20/22</td>
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<tr>
<td></td>
<td>CNS Disease Progression = 18%, 4/22</td>
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</table>
Patient Current Status

• Active Follow-up = 63
• Transfer of Care = 8
  • Decision to receive RT closer to place of residence
  • Decision to have NS performed at university hospital
• Hospice Care = 6
• Declined Treatment = 1
• Lost to Follow-up = 1
• Deceased = 22 (18/22 with Stage IV disease)
Conclusions

• Unique Community-Hospital Based CNS Clinic Model
• High Patient Approval at Extended Follow-up
• Regional Referral Center for Complex CNS Disease
• Delivers State-of-the-Art, Evidence-Based Treatment Modalities in a Community Hospital Setting
• Good Local Control and Low Rates of (G3/4) Radiation-Induced Toxicity
• Access to On-Going Clinical Trials
• Future Considerations: Analyzing Cost-Benefit, CNS Morbidity/Mortality Rates, Early Detection Rate, Elderly Adult Patient Outcomes, and Caregiver Impact