

RTOG 0631 Phase II/III study of image-guided radiosurgery/SBRT for localized spine metastasis

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Purpose:

Primary Objective:

Phase II Component

Determine the feasibility of successfully delivering image-guided radiosurgery/SBRT for spine metastases in a cooperative group setting

Phase III Component

Determine whether image-guided radiosurgery/SBRT (single dose of 16 Gy) improves pain control (as measured by the 11 point NRPS) as compared to conventional external beam radiotherapy (single dose of 8 Gy)

The endpoint is complete or partial pain relief at the treated index site at 3 months, (as measured by the 11 point NRPS). Complete pain relief is defined as a score of 0 on the NRPS, with no increase in narcotic pain medication. Partial pain relief is defined as an improvement from the baseline NRPS of at least 3 points on the rating scale (and no progressive pain response at any other treated lesion[s], with no increase in narcotic pain medication).

Secondary Objectives (Phase III component):

Determine whether image-guided radiosurgery/SBRT improves the rapidity of pain response at the treated site(s) as compared to conventional external beam radiotherapy, as measured by the NRPS.

Determine whether image-guided radiosurgery/SBRT increases the duration of pain response at the treated site(s), as compared to conventional external beam radiotherapy, as measured by the NRPS.

Compare adverse events between the two treatments according to the criteria in the CTEP Active Version of the CTCAE.

Evaluate the long-term effects (24 months) of image-guided radiosurgery/SBRT on the vertebral bone (such as compression fracture) and the spinal cord by MRI.

Evaluate the potential benefit of image-guided radiosurgery/SBRT on change in and overall quality of life, as measured by the Functional Assessment of Cancer Therapy-General (FACT-G); in pain as measured by the Brief Pain Inventory (BPI); and in health utilities as measured by the EuroQol (EQ-5D).

To implement a well-controlled specimen handling/storage process to facilitate future laboratory correlative studie.

Schema

Phase II Component: Radiosurgery/SBRT: Single fraction dose of 16 Gy

Phase III Component:

Stratify: Number of spine metastases:

- 1) 1
- 2) 2-3

Randomize:

Arm 1: Radiosurgery/SBRT: Single fraction dose of 16 Gy

Arm 2: External Beam Radiation Therapy: Single fraction dose of 8 Gy

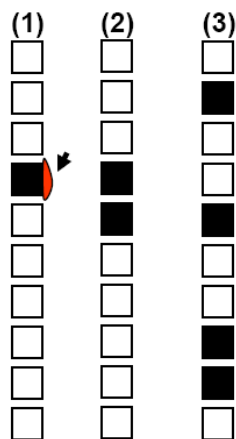
Randomization ratio (Arm 1: Arm 2) = 2:1

Criteria for Inclusion of Subjects:

- The patient must have localized spine metastasis from the C1 to L5 levels by a screening imaging study [bone scan, PET, CT, or MRI] (a solitary spine metastasis; two separate spine levels; or up to 3 separate sites [e.g., C5, T5-6, and T12] are permitted.) Each of the separate sites may have a maximal involvement of 2 contiguous vertebral bodies.
- See Figure 1 below for a depiction of eligible metastatic lesions: 1) a solitary spine metastasis; 2) two contiguous spine levels involved; or 3) a maximum of 3 separate sites. Each of the separate sites may have a maximal involvement of 2 contiguous vertebral bodies. Epidural compression (arrow) is eligible when there is a ≥ 3 mm gap between the spinal cord and the edge of the epidural lesion (see Section 3.1.10). A paraspinous mass ≤ 5 cm is allowed (see Section 3.1.11).

Figure 1: Diagram of Eligible Metastatic Lesions

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- Zubrod Performance Status 0-2;
- Age ≥ 18 ;
- History/physical examination within 2 weeks prior to registration;
- Negative serum pregnancy test within 2 weeks prior to registration for women of childbearing potential;
- Women of childbearing potential and male participants who are sexually active must agree to use a medically effective means of birth control;
- MRI of the involved spine within 4 weeks prior to registration to determine the extent of the spine involvement; an MRI is required as it is superior to a CT scan in delineating the spinal cord as well as identifying an epidural or paraspinous soft tissue component. Note: If an MRI was done as a screening imaging study for eligibility (see Section 3.1.1), the MRI can be used as the required MRI for treatment planning.
- Numerical Rating Pain Scale within 1 week prior to registration; the patient must have a score on the Scale of ≥ 5 for at least one of the planned sites for spine radiosurgery. Patients taking medication for pain at the time of registration are eligible.
- Neurological examination within 1 week prior to registration to rule out rapid neurologic decline; Patients with mild to moderate neurological signs are eligible. These neurological signs include radiculopathy, dermatomal sensory change, and muscle strength of involved extremity 4/5 (lower extremity for ambulation or upper extremity for raising arms and/or arm function).

- Patients with epidural compression are eligible provided that there is a ≥ 3 mm gap between the spinal cord and the edge of the epidural lesion.
- Patients with a paraspinal mass ≤ 5 cm in the greatest dimension and that is contiguous with spine metastasis are eligible.
- Patients must provide study specific informed consent prior to study entry.

Criteria for Exclusion of Subjects:

- Histologies of myeloma, lymphoma, renal cell carcinoma, or melanoma;
- Patients with any spine metastasis with a rating of ≥ 5 on the Numerical Rating Pain Scale that is not planned to be treated with radiosurgery;
- Non-ambulatory patients;
- Spine instability due to a compression fracture;
- $>50\%$ loss of vertebral body height;
- Frank spinal cord compression or displacement or epidural compression within 3 mm of the spinal cord;
- Patients with rapid neurologic decline;
- Bony retropulsion causing neurologic abnormality;
- Prior radiation to the index spine;
- Patients for whom an MRI of the spine is medically contraindicated;
- Patients allergic to contrast dye used in MRIs or CT scans.