



RTOG Sarcoma Working Group Consensus on The GTV and CTV

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RTOG Extremity Soft Tissue Sarcoma Atlas

RTOG Sarcoma Working Group Consensus
on The GTV and CTV For Preoperative
Radiotherapy of Large High Grade
Extremity Soft Tissue Sarcoma

Definition of GTV and CTV

- **Gross Target Volume (GTV):** Gross tumor defined by MRI T1 plus contrast images (MRI with contrast is required). Fusion of MRI and CT is recommended to delineate the GTV for radiotherapy planning. Intravenous contrast is recommended, particularly for upper extremity lesions, where there is a greater rotational mobility and positioning fidelity between the diagnostic MRI and the planning CT may be more difficult to achieve
- **Clinical Target Volume (CTV) for intermediate-to-high grade sarcoma ≥ 5 cm:** Include gross tumor and clinical microscopic margins. Typically CTV = GTV plus 3 cm margins in the longitudinal (proximal and distal) directions. If this causes the field to extend beyond the compartment, the field can be shortened to include the end of a compartment. The radial margin from the lesion should be 1.5 cm including any portion of the tumor not confined by an intact fascial barrier, bone or skin surface. The suspicious edema defined on MRI T2 images is often included within the above margins. However, clinical judgment is required to make sure if the above margins need to be extended to cover the T2 edema defined on MRI T2 images. For example, the extensive T2 edema may be excluded if clinical judgment suggests that the risk of the edema harboring sarcoma many cm beyond the GTV is low or if extending the radiation field to include all of the edema would cause excessive toxicity.

Example Case

- 55-year-old male with a large high-grade round cell liposarcoma in right distal thigh. Clinical stage (AJCC 7th edition) III T2bN0M0G3.
 - The MRI of right distal thigh showed a large well circumscribed heterogeneous, multiloculated mass located within the posterior thigh.
 - The tumor measured 14.8 cm in craniocaudal dimension, 7.8 cm in AP dimension, and 11.3 cm in maximal medial-lateral dimension.
- Simulation CT images were fused with those from the diagnostic thigh MRI

Consensus Contours

- The consensus contours for the GTV and CTV were generated based on the modification of the 95% agreement contours by RTOG Sarcoma Working Group Radiation Oncologists
 - RTOG Sarcoma Radiation Oncologists Reach Consensus on Gross Tumor Volume (GTV) and Clinical Target Volume (CTV) on Computed Tomographic Images for Preoperative Radiotherapy of Primary Soft Tissue Sarcoma of Extremity in RTOG Studies. IJROBP June 2011













































































































































































