

## Radiological And Pathological Response Following Pre-Operative Radiotherapy For Soft-Tissue Sarcoma

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### Abstract

**PURPOSE:** To report radiological and pathological response to neo-adjuvant radiotherapy for extremity and trunk soft-tissue sarcomas. **MATERIALS/METHODS:** Fifty patients were identified retrospectively. All patients had MRI imaging pre and post neo-adjuvant external beam radiotherapy. Tumor volumes were measured in 3D on T1 Gadolinium enhanced sequences. Pathological treatment response was quantified in terms of percentage of treatment-related necrosis for each case. **RESULTS:** Histopathologic responses to treatment varied from 0% to 100%. The median pathological treatment response was 67.5% for low-grade sarcomas and 50% for high-grade sarcomas. The median decrease in tumor volume was 13.8% for non-myxoid low-grade sarcomas, 82.1% for myxoid liposarcomas and <1% for high-grade sarcomas. A partial response on MRI (volume reduction  $\geq 50\%$ ) was highly predictive of a good pathological response ( $p < 0.001$ ). Patients with stable disease on imaging or volumetric progression had wide ranging pathological responses. **CONCLUSIONS:** Soft-tissue sarcomas show significant pathological treatment responses in the form of hyaline fibrosis, necrosis and granulation tissue. Despite this, there is minimal early volumetric response to radiation, especially for high-grade tumors. Although radiological partial response was predictive of pathological response, the significance of radiological progression was unclear. Myxoid liposarcoma tumor type was predictive of both pathological and radiological tumor response.

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