Evaluation of Radiological and Pathological Response Following Pre-operative Radiotherapy of Soft-tissue Sarcoma

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Purpose
To report radiological and pathological response to neo-adjuvant radiotherapy for extremity soft tissue sarcoma

Methods
Retrospective analysis of 27 patients with soft tissue sarcomas of various types
Selection Criteria:
> Pathologically confirmed primary soft tissue sarcoma of the trunk or extremity
> Neoadjuvant external beam radiotherapy, 50 Gy in 25 fractions
> MRI images available before and after RT

Background
> NCIC SR2 2002: Equivalent cancer-related outcome for neoadjuvant radiotherapy (NeoRT)
More acute wound complications and less long-term morbidity
> Meric et al.: 43% decrease in STS tumor volume with NeoCT
Radiographic response predicted improved local recurrence rate and overall survival
> Pitson et al. 2004: Median 58% reduction in tumor volume of myxoid liposarcoma with NeoRT
> Eilber et al. 2001: ≥95% neoadjuvantchemoradiation-induced necrosis predictive of decreased local recurrence and improved overall survival rates in STS

Results

<table>
<thead>
<tr>
<th></th>
<th>High Grade (%)</th>
<th>Low Grade (%)</th>
</tr>
</thead>
<tbody>
<tr>
<td>CR (no residual)</td>
<td>0 (0)</td>
<td>0 (0)</td>
</tr>
<tr>
<td>PR (≥50% decrease)</td>
<td>3 (15)</td>
<td>3 (43)</td>
</tr>
<tr>
<td>MR (15-50% decrease)</td>
<td>4 (20)</td>
<td>2 (29)</td>
</tr>
<tr>
<td>SD (&lt;15% increase/ decrease)</td>
<td>10 (50)</td>
<td>1 (14)</td>
</tr>
<tr>
<td>PD (&gt;15% increase)</td>
<td>3 (15)</td>
<td>1 (14)</td>
</tr>
<tr>
<td>total</td>
<td>20</td>
<td>7</td>
</tr>
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Conclusions
> Patients and physicians should not expect significant tumor shrinkage except for myxoid liposarcoma
> To be shown whether tumor volume reduction is a predictive factor for local recurrence or survival
> Tumor volume changes weakly correlate with pathological changes
> A longer interval between RT and 2nd MRI may have resulted in better response

A partial response on MRI was highly predictive of a good pathological response (p<0.001). Patients with stable disease on imaging had wide ranging pathological responses (0-95%). Imaging progression did not predict poor pathological response (range 0-60%, p=0.15)