

NEWSBRIEFING 2

128 Skin Toxicity And Pain In Patients Treated With Stereotactic Body Radiotherapy

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Purpose/Objective(s): Stereotactic Body Radiotherapy (SBRT) has rapidly gained popularity in the treatment of early stage lung cancer. While local control appears quite promising toxicity parameters remain to be defined. The purpose of this study is to determine dose-volume parameters that may help predict chest wall (CW) toxicity (pain and skin reactions) in patients receiving thoracic SBRT.

Materials/Methods: We screened a database of 200 patients treated with SBRT between August 2004 and August 2008, to find patients with tumors within 2 cm of the CW. All patients were treated to a total dose of 50Gy in 4 daily fraction of 12.5Gy. CW dose volume histograms were constructed using Pinnacle treatment planning system, by subtracting the lung contour from the external patient contour and then measuring the volume of this structure that received a specific dose of radiation. Tissue heterogeneity corrections were used in all cases. Skin changes and pain were scored using the NCI CTC toxicity scale version 3, pain that developed 0-2 months after SBRT was consider acute pain after this time was consider chronic.

Results: Of the 200 patients screened 132 had tumors within 2cm of the chest wall, of these patients 59 (44%) developed skin changes. On multivariate analysis there was a trend towards skin change and tumor location with 50% of patients with posterior chest tumors developing chest pain compared to the 34% of anterior tumors, $p=0.08$. PTV volume was found to be significant at 71cc vs. 102cc ($p=0.036$). The volume of the chest receiving 20Gy, 30Gy, 35Gy and 40Gy were all significant between patients with and without skin changes. The percentage of patients that developed skin changes based on the volume of the CW that received >30Gy in the range of 150-200cc and >200cc were 20%, 37%, 44%, 56% and 81%. Nine patients (6%) developed acute pain while 20 patients (14%) developed chronic pain. Of the patients that developed chronic pain 40% (8/20) was grade 1 and 55% (11/26) grade 2-3. The risk of grade 2 or higher pain was based on the volume of chest wall receiving >30Gy in the range of 50cc, 50-150cc and >150cc were 0%(0/30), 7%(5/67) and 31% (10/32).

Conclusions: Here we present to the first report of skin toxicity and skin pain from a large patient cohort of patients treated with SBRT of 50Gy delivered in four fractions. CW toxicity was correlated to both PTV size and CW dose. While PTV volumes are predetermined by tumor size and motion, CW dose can be reduced through treatment planning. If SBRT is going to replace surgery for early stage lung cancer it will not only have to demonstrate comparable local control but also demonstrate reduced toxicity, as such the CW dose receiving 30Gy should be limited to below 150cc, when using this fractionation.

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