4-1: CT Appearance of Radiation Injury of the Lung after Stereotactic Radiation Therapy (SRT) for Small Lung Tumors

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**Purpose**

Stereotactic radiation therapy (SRT) has been shown to be a highly effective treatment for small lung tumors. Due to the focusing of a high dose around the tumor, CT appearance after SRT differs from that after conventional radiation therapy. The purpose of this study was to evaluate the CT appearance of radiation injury to the lung after SRT for small lung tumors.

**Methods and Materials**

In this analysis, 28 patients with 30 primary or metastatic lung tumors were enrolled. The follow-up at the time of evaluation ranged from 6 to 39 months (median 17 months). SRT was performed by 3D conformal method which focuses a single high dose to the tumor. We evaluated the CT appearance of acute radiation pneumonitis (within 3 months) and radiation fibrosis (after 3 months) after SRT.

**Results**

CT appearance of acute radiation pneumonitis was classified as follows 1); 1) diffuse consolidation in 10 lesions (33.3%), 2) patchy consolidation and ground-grass opacities (GGO) in 5 lesions (16.7%), 3) diffuse GGO in 5 patients (16.7%), 4) patchy GGO in 1 lesion (3.3%), 5) no evidence of increasing density in 9 lesions (30%). CT appearance of radiation fibrosis was classified as follows 2); 1) modified conventional pattern (consolidation, volume loss and bronchiectasis similar to, but less extensive than conventional radiation fibrosis) in 16 lesions (53.3%), 2) mass-like pattern (focal consolidation limited around the tumor) in 5 lesions (16.7%), 3) scar-like pattern (linear opacity in the region of the tumor associated with volume loss) in 9 lesions (30%). All 9 lesions which had no evidence of increasing density of acute radiation pneumonitis progressed to scar-like pattern of radiation fibrosis.

**Conclusion**

CT appearance after SRT correlated five patterns of acute radiation pneumonitis and three patterns of radiation fibrosis. We are able to show a trend that there was no evidence of increasing density pattern of acute radiation pneumonitis progress to scar-like pattern of radiation fibrosis.