Gallium-67 citrate imaging for the assessment of radiation pneumonitis

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In order to evaluate its usefulness in the assessment of radiation pneumonitis, gallium-67 citrate (67Ga) imaging was performed before and after radiation therapy (RT) on 103 patients with lung cancer. In 23 patients with radiation pneumonitis detected radiographically, abnormal 67Ga uptake in sites other than tumors was found in all post-RT 67Ga lung images. Three patterns of uptake were found: (A), focal uptake corresponding to the RT field (n=10); (B), diffuse uptake including the RT field (n=4), and (C), diffuse uptake outside the RT field (n=9). The area of 67Ga uptake was consistent with that of interstitial pneumonitis as revealed histopathologically in 7 cases. 67Ga uptake in pattern (C) was an indicator of poor prognosis for the patients with radiation pneumonitis. 67Ga uptake in the patients with reversible pneumonitis disappeared with steroid therapy. Sixteen (20%) of 80 asymptomatic patients, in whose chest radiographs there was no finding of radiation pneumonitis, showed transient 67Ga uptake. These were considered to occur in the subclinical radiation pneumonitis. These data suggest that 67Ga imaging is more sensitive than chest radiography in the detection of radiation pneumonitis and is useful in the assessment of the extent and clinical course of radiation pneumonitis.

Key words: Radiation pneumonitis, Gallium imaging, Radiation injury to the lung.