

ABSTRACT

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Posttherapy technetium-99m pentavalent dimercaptosuccinic acid brain single-photon emission computed tomography/computed tomography: diagnostic and prognostic values in patients with glioma.

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PURPOSE: To assess the value of posttherapy 99mTc-pentavalent dimercaptosuccinic acid (DMSA-V) brain SPECT/CT in patients with brain glioma.

METHODS: Patients with pathologically or radiologically proven glioma were prospectively enrolled in this study. 99mTc-DMSA-V brain SPECT/CT images were acquired at 120-180 min after i.v. injection of 555-740 MBq of 99mTc-DMSA-V. Three nuclear medicine physicians blindly interpreted the scans visually as positive or negative for residual/recurrent disease. Agreement between two or more readers was considered a consensus. The composite reference standard was considered based on subsequent clinical/neuroimaging follow-up or histopathology whenever available. Overall survival (OS) was calculated from the date of initial diagnosis till the death or the date of last follow-up.

RESULTS: Thirty-four patients (18 males and 16 females; mean age 37.7 ± 16 years) were enrolled in this study. Interreader agreement between the readers ranged from 0.71 to 0.82. Based on the composite reference standard, residual/recurrent disease was confirmed in 16 patients, whereas 18 patients were negative for disease. Consensus reading of 99mTc-DMSA-V SPECT/CT accurately diagnosed 13 true positive (sensitivity 81%) and 17 true negative scans (specificity 94%). After a median follow-up of 22.9 months, 7/14 patients with positive 99mTc-DMSA-V SPECT/CT brain readings died compared to 4/20 with negative readings. The median survival was 24.1 months for the positive group and was not reached for the negative group.

CONCLUSION: Posttherapy brain SPECT/CT scanning with 99mTc-DMSA-V is a noninvasive, reliable, and specific tool for evaluation of patients with brain glioma after definitive therapy. Scan positivity was associated with poor OS.

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