INTRACEREBRAL METASTASES SHOWING RESTRICTED DIFFUSION: CORRELATION WITH HISTOLOGIC FINDINGS

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Purpose: The purposes of this study were to find how often is the restricted diffusion observed in the intracerebral metastases and to find whether there is a correlation between the primary tumor histology and diffusion-weighted MR imaging (DWI) findings of the metastases.

Methods: 76 patients with clinical, histological and routine MR imaging evidence of intracerebral metastases were examined with routine MR imaging and DWI. Patients with metastases with signs of intralesional hemorrhage on unenhanced T1-weighted images were excluded. The routine MR imaging included at least the axial T2-weighted and axial T1-weighted turbo spin-echo sequences before and after contrast enhancement. The DWI included an echo-planar spin-echo sequence with three b values (0,500 and 1000 s/mm²) sensitizing gradient in the z direction, and calculated ADC maps. 76 patients were divided into groups with respect to primary tumor histology (lung carcinomas were examined as small cell and non-small cell carcinomas). The ratio of the patients having metastases with restricted diffusion were calculated and with respect to primary tumor histology we examined whether there is statistical significant difference between the groups in frequency of having metastases with restricted diffusion. ADC_{min} values were measured within the solid components of the tumors and statistical differences between the ADC_{min} values of metastases with high signal intensity on DWI and other metastases were also evaluated. Fisher's exact test and Mann-Whitney test were used for the statistical analysis.

Results: In 15 patients (19.7%) metastases with restricted diffusion were observed. In 10 of these cases (66.6%) primary malignancy was lung ca (5 small cell ca, 5 non-small cell ca), and in three cases (20%) breast ca. In 27% of lung ca and in 15% of breast ca metastases restricted diffusion were observed. There were no statistical significant differences between the groups in frequency of having metastases with restricted diffusion ($p>0.05$). ADC_{min} values of solid components of the metastases with restricted diffusion and other metastases also showed no significant statistical difference (0,72±0,16x10-3 mm²/s and 0,78±21x10-3 mm²/s respectively) (p=0,325).

Conclusion: Intracerebral metastases showing restricted diffusion on DWI are not rarely seen particularly if the primary tumor is lung or breast cancer. However prospective studies with larger groups and more information are necessary regarding the correlation between the primary tumor histology and the ratio of metastases with restricted diffusion. There is no correlation between ADC_{min} values of the solid components of the metastases with restricted diffusion and their DWI findings.