

1H-MRS resonance at 2.05 ppm in mucin producing adenocarcinoma metastases in the brain

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Aim

To evaluate whether a resonance at 2.05 ppm in the in vivo 1H-MR spectrum from brain metastases correlates with the histopathological tumour type.

Patients and methods

The MR spectra from brain metastases in 20 consecutive patients were retrospectively evaluated for the occurrence of a resonance at 2.05 ppm. Spectra had been acquired on a 1.5 T MR scanner (Magnetom, Vision, Siemens) with a single voxel (SVS) or multivoxel technique (CSI) using PRESS sequences with TR 1500ms and TE 272 ms. Voxel contamination in cystic parts of the lesions from solid brain or tumour tissue was ruled out by review of voxel positions or based on the absence of significant resonances from choline containing compounds and creatine. Classification of the lesions was based on histological examination of operation or biopsy specimens in 17 cases, autopsy in one case, cytology in one case, and no histological diagnosis was available in one case.

Results

Histological classification of the metastatic lesions showed 12 cases of adenocarcinoma, 3 cases of melanoma, and one case each of small cell carcinoma, ductal breast cancer, sarcoma and neuroendocrine tumour. The resonance at 2.05 ppm was identified in three cystic adenocarcinoma metastases (figure 1A) with production of mucin, which made them different from the other non-mucinous adenocarcinoma metastases (figure 1B).

Discussion and conclusion

Although the resonance at 2.05 ppm has not been assigned yet, it is most likely to represent sialic acid found in the mucin of mucinous adenocarcinoma metastases. The treatment of adenocarcinoma metastases does not differ between mucinous and non-mucinous tumours. However, the exact identification of the resonance might be of clinical interest, as the resonance can, by the more inexperienced reader of MR spectra, be misinterpreted as the acetate resonance in brain abscesses at 1.9 ppm (figure 1C) or as NAA (2.02 ppm).

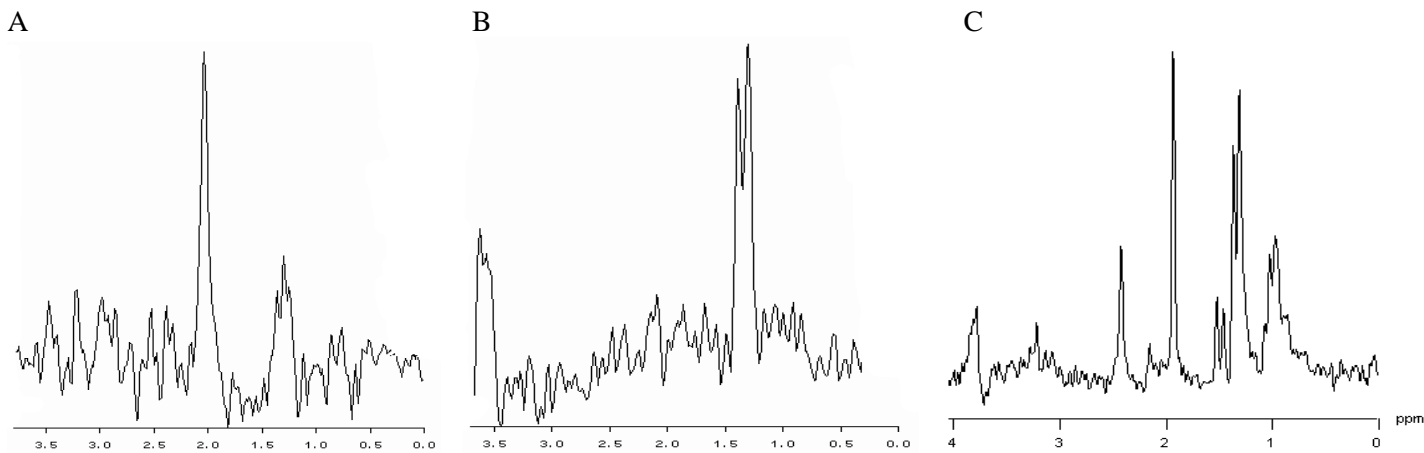


Figure 1. Spectrum from the cystic portion of an adenocarcinoma metastasis with mucin production and the resonance at 2.05 ppm (A) and without mucin production (B). Both metastases show increased lactate at 1.3 ppm. Spectrum - 3T Siemens Allegra - representing a brain abscess with the acetate resonance at 1.9 ppm (C).