

Magnetic Resonance Imaging of Brain Metastases: Magnetisation Transfer or Triple Dose Gadolinium?

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Abstract

Magnetic resonance (MR) imaging of brain metastases relies on the neovascularity of metastases and the associated breach of blood-brain barrier manifesting as enhancement on T1-weighted images. There are 2 main strategies to improve the detection of brain metastases. One may increase the dose of gadolinium and increase the signal of the lesion. Alternatively, one may also lower the signal of the background (by magnetisation transfer suppression), in which case the enhancing lesion is rendered more conspicuous without increasing the dose of gadolinium.

We aim to compare the efficacy of single-dose conventional spin-echo T1 scans with magnetisation transfer (MT) suppression with triple-dose conventional spin-echo T1 scans in the detection of brain metastases in 18 patients undergoing imaging for brain metastases. An incremental dose technique was employed. After administration of a single dose of gadolinium, MT suppressed T1-weighted scans were obtained, followed by a conventional T1 scan. Two doses of gadolinium were subsequently given, achieving a cumulative triple-dose, and a conventional T1-weighted scan was then performed.

We found single-dose MT suppressed and triple-dose scans performed equally well and detected 26 metastatic lesions. They detected 5 (5/26, 19%) more lesions than the conventional single-dose T1 scans. Five (5/21, 24%) questionable lesions on single-dose conventional scans were confidently diagnosed on the single-dose MT suppressed and the triple-dose conventional scan. We conclude that single-dose MT suppressed scans are a cost-effective technique of detecting brain metastases.

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