Case Report: Leptomeningeal Disease on Susceptibility-Weighted Imaging (*syngo* SWI)

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Patient history

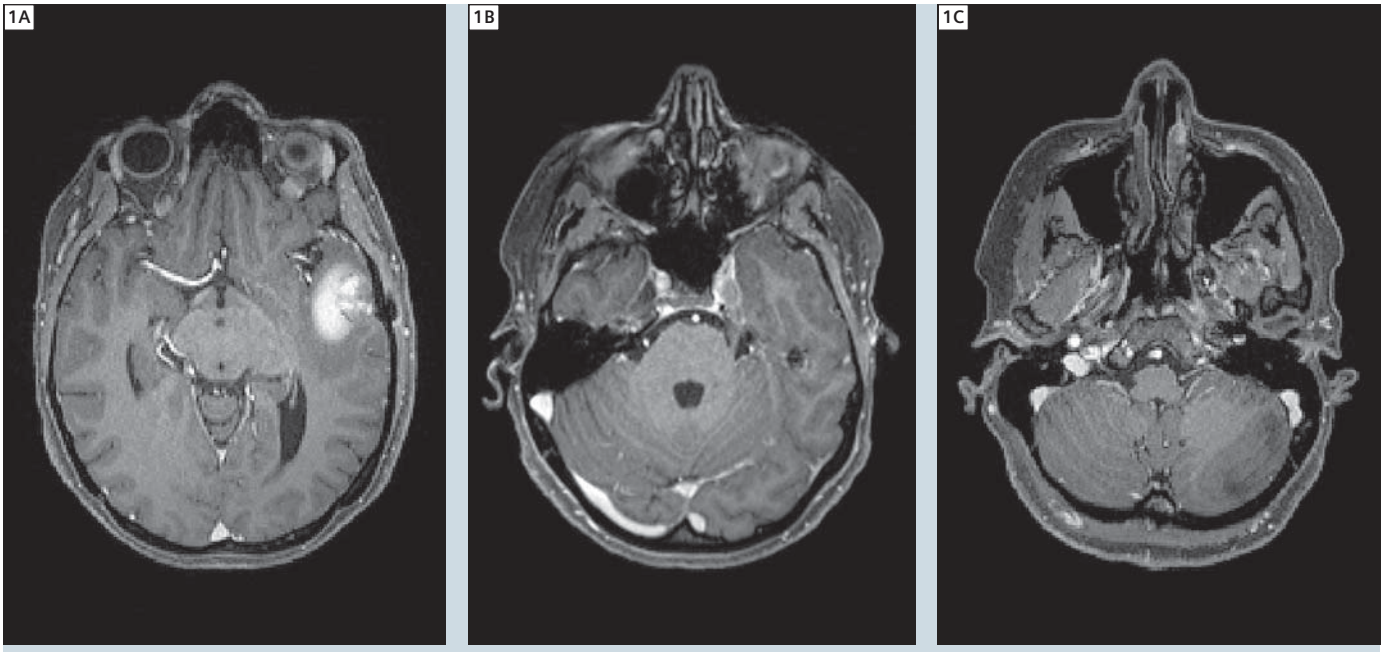
A 41-year-old female, of caucasian descent, with known metastatic melanoma, presented with new onset of left trigeminal nerve symptoms (left facial sensory abnormalities) and diplopia. Spinal leptomeningeal tumor deposits had been demonstrated at MRI 2 weeks earlier, at the C5 and lumbo-sacral levels, though the CSF was not examined at that time. The only CSF examination at our institution was performed 9 months earlier, and was negative at that time.

Sequence details

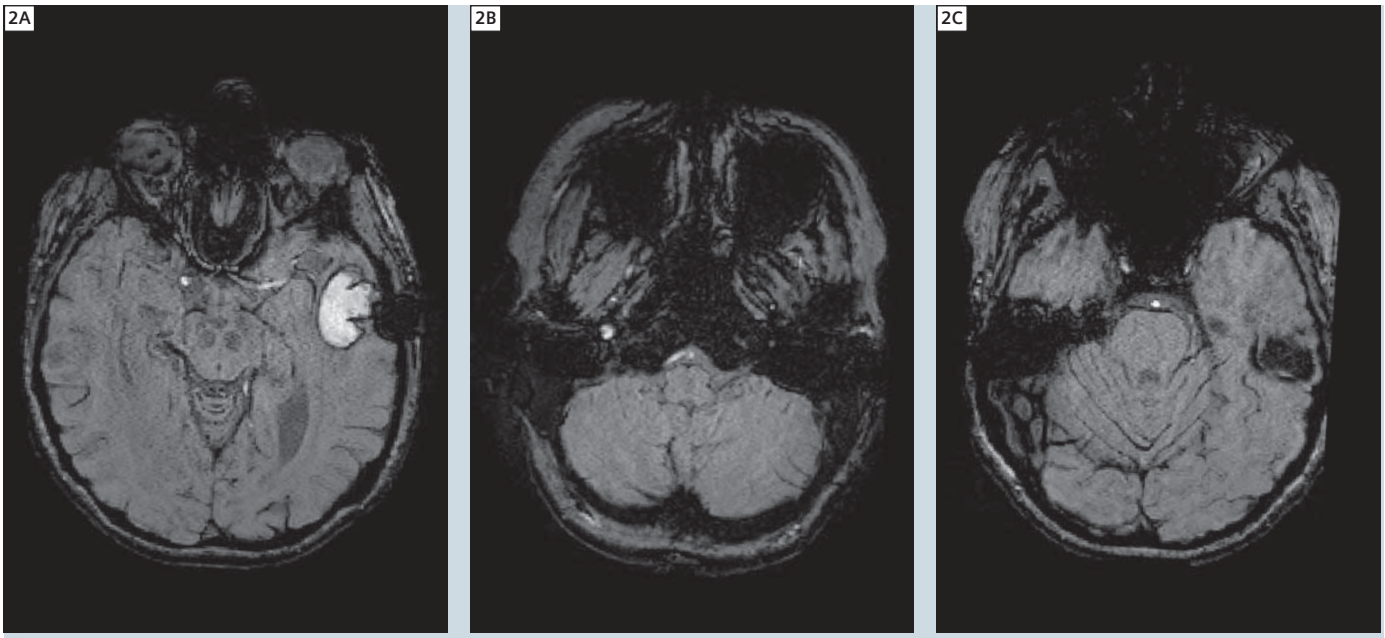
We used *syngo* SWI with the following parameters:
TR 27 ms, TE 20 ms, bandwidth 120 Hz/pixel, slice thickness 2 mm with a 0.4 mm gap, matrix 256 x 182, 1 average. Scan time was 2:48 min.

Image findings

T1-weighted images demonstrated evidence of a haemorrhage from a known pre-existing metastasis in the left temporal lobe, with a new T1 hyperintense collection seen medial to a heterogeneous mass laterally in the left temporal lobe; only part of this underlying mass was shown to enhance (Fig. 1A). Post-contrast images demonstrated a weakly-enhancing mass filling Meckel's cave on the left, engulfing the branches



1 Post-contrast T1-weighted MRI **(A)** demonstrating haemorrhage in the left temporal lobe. **(B)** showing the left trigeminal nerve lesion. **(C)** demonstrates the weakly contrast-enhancing mass of the Meckel's cave.



2 Susceptibility-weigthed MRI – *syngo* SWI.

of the left trigeminal nerve (Fig. 1B). There was also questionable enhancement on the surface of the medulla (Fig. 1C).

Susceptibility-weighted images (*syngo* SWI) showed the expected hypointense rim around the left temporal hematoma (Fig. 2A), with a defect at the site of rupture of the underlying metastasis into the haematoma. Of note, SWI did not show abnormal signal on the cortical surface of the left temporal lobe, and no SWI or FLAIR signal abnormality was seen in adjacent subarachnoid spaces. SWI also showed a thin layer of marked signal loss on the surface of the medulla (Fig. 2A), and in multiple cerebellar sulci superiorly (Fig. 2B). In context, this was strongly suspicious for leptomeningeal tumor deposits. The differential diagnosis includes superficial siderosis (secondary to repeated subarachnoid haemorrhages from vascular anomalies), normal neuromelanin (in those with heavily pigmented skin), and neurocutaneous melanosis (usually in young children). Others [1] have noted that T2*-weighted imaging may significantly improve the detection of cerebral melanoma metastases.

[1] Gaviani P et al AJNR 27:605-8, 2006.

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