

MRI demonstration of Kernohan's notch: case report

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Summary. We report a left acute subdural haematoma caused by rupture of a left anterior cerebral artery aneurysm, which progressed to left hemiparesis. Coronal MRI was superior to CT for visualizing Kernohan's notch.

Key words: Magnetic resonance imaging – Kernohan's notch – Coronal image

Compression of the cerebral peduncle against the free edge of the tentorium contralateral to a supratentorial mass has been known as Kernohan's notch, and is a cause of a false localizing sign [1, 2]. Magnetic resonance imaging (MRI) has been reported as clearly demonstrating the central structures of the brain [3–5], and Cohen and Wilson [2] reported that MRI could clearly demonstrate Kernohan's notch secondary to a traumatic extradural haematoma. Although, as previously reported [5], coronal MR images are most useful for demonstrating the anatomical relations between the midbrain and the tentorium, the utility of coronal MR images for delineating Kernohan's notch has yet to be reported.¹ We report a case of left acute subdural haematoma due to ruptured of a left anterior cerebral artery aneurysm, which resulted in a left hemiparesis caused by Kernohan's notch, and stress the ability of coronal MR images to show this phenomenon.

Case report

A 39-year-old man, in the absence of trauma, suddenly became unconscious. He was transferred to our hospital 2 h after the ictus. On admission, he was in deep coma, with dilated pupils, showing no reaction to light. He was intubated, and given mannitol and barbiturate intravenously. CT revealed a dense lesion over the left cerebral hemisphere (Fig. 1), diagnosed as a non-traumatic acute subdural haematoma and left carotid angiography revealed an aneurysm peripherally on the left anterior cerebral artery

(Fig. 2). An emergency operation for removal of the left acute subdural haematoma and clipping of the ruptured aneurysm was performed 5 h after the ictus. After 6 days of postoperative barbiturate coma therapy, his level of consciousness was gradually increased and a left hemiparesis became evident. This hemiparesis ipsilateral to the acute subdural haematoma was thought to be caused by Kernohan's notch.

MRI 3 months after the ictus revealed a lesion in the right cerebral peduncle, hypointense and hyperintense on T1- and T2-weighted images, respectively (Fig. 3a,b). Moreover, coronal images (Fig. 3c,d) not only demonstrated the lesion but also revealed its anatomical relationship to the tentorium: it was in the lateral part of the cerebral peduncle and extended along the tentorium. These findings were thought to indicate that the lesion was produced by compression of the cerebral peduncle against the free edge of the tentorium.

Discussion

Kernohan's notch is well known as a cause of a false localizing sign, and studied clinically and pathologically [1, 2]. However, Kernohan's notch is very small and located in the cerebral peduncle; in close proximity to the skull base, CT has not been thought capable of depicting it. MRI has been reported as having great capabilities for demonstrating such central structures of the brain as the brain stem [3–5] and, recently, Cohen and Wilson [2] reported a clear T2-weighted axial image of Kernohan's notch secondary to a traumatic extradural haematoma. In our case, coronal MRI (Fig. 3c,d) demonstrated Kernohan's notch very clearly, and revealed the anatomical relationship between it and the tentorium. The exact location and extent of the lesion, in the lateral part of the cerebral peduncle and along the slope of the tentorium, which strongly suggest that the lesion is indeed Kernohan's notch, produced by compression of the cerebral peduncle against the tentorial incisura, could be revealed only by coronal images. We would therefore emphasize the utility of coronal MR images for detecting and diagnosing Kernohan's notch.

¹ After we submitted this paper, a coronal MR image of Kernohan's notch was published in AJNR: Jones KM et al (1991) AJNR 12: 1238–1239

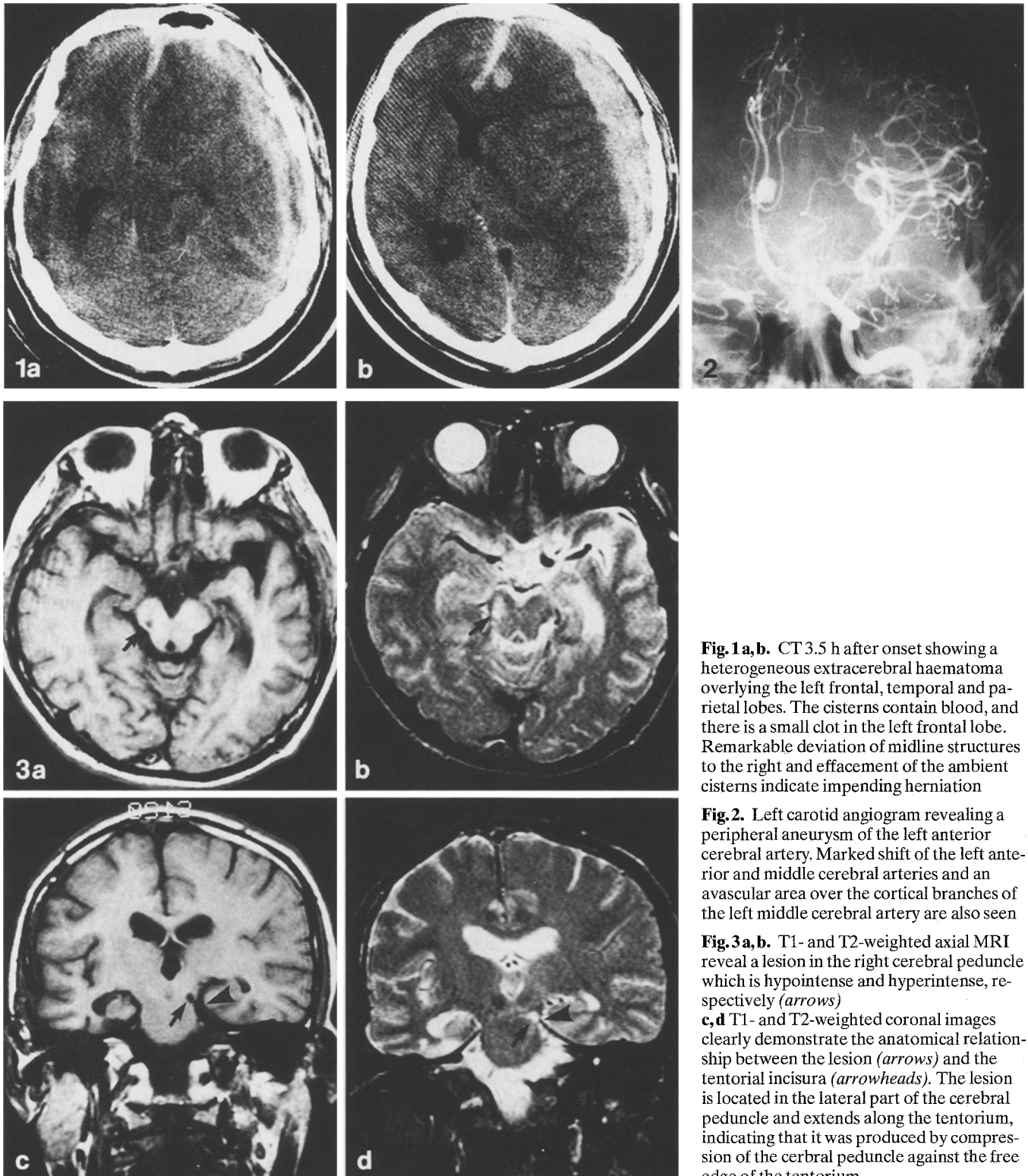


Fig. 1a, b. CT 3.5 h after onset showing a heterogeneous extracerebral haematoma overlying the left frontal, temporal and parietal lobes. The cisterns contain blood, and there is a small clot in the left frontal lobe. Remarkable deviation of midline structures to the right and effacement of the ambient cisterns indicate impending herniation

Fig. 2. Left carotid angiogram revealing a peripheral aneurysm of the left anterior cerebral artery. Marked shift of the left anterior and middle cerebral arteries and an avascular area over the cortical branches of the left middle cerebral artery are also seen

Fig. 3a, b. T1- and T2-weighted axial MRI reveal a lesion in the right cerebral peduncle which is hypointense and hyperintense, respectively (arrows)

c, d T1- and T2-weighted coronal images clearly demonstrate the anatomical relationship between the lesion (arrows) and the tentorial incisura (arrowheads). The lesion is located in the lateral part of the cerebral peduncle and extends along the tentorium, indicating that it was produced by compression of the cerebral peduncle against the free edge of the tentorium

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