Intraventricular haemorrhage complicating a brain abscess

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Summary: Intraventricular haemorrhage occurred in a patient with a parietal rim-enhancing mass on computed tomographic scan. At operation a brain abscess was identified and removed. *Peptostreptococcus* and *fusobacterium* were isolated, possibly of dental origin. The possible sources of this intracranial bleeding are discussed. A neoplasm should not always be considered in the case of a cerebral ring-enhancing mass complicated with intracranial bleeding; in selected cases, brain abscess should be excluded too.

Introduction

The initial clinical features of a solitary single brain abscess are far from stereotyped.¹ Intracranial hypertension with meningitis and an expanding mass syndrome are among the three basic clinical presentation patterns described.^{1–4}

In this paper we report a case of intraventricular haemorrhage in a patient with a right parietal lobe abscess. The possible sources of the cranial bleeding are discussed.

Case report

A 50 year old man was admitted with a meningeal syndrome of sudden onset. He was in good health until four days earlier when his family noticed, that he was frequently ignoring objects placed to his left. The day before admission he became febrile with a slight headache. The following day he suddenly developed a violent headache and profuse vomiting and was transferred to this hospital. Systemic examination was normal, except for a septic mouth with a local abscess in the left upper incisor. On neurological examination he was drowsy and confused, there was a slight left hemiparesis as well as left visual and sensory impairment. Meningeal signs were present but fever was absent.

Routine haematology, biochemistry and radiology were unhelpful. A computed tomographic (CT) scan of the brain performed without contrast showed decreased attenuation in the subcortical parietal white matter on the right side, intraventricular haemorrhage with subarachnoid extension and moderate ventricular enlargement (Figures 1a and 2). After the

injection of contrast material, a round, rim-enhancing mass, with central low density and surrounding cerebral oedema was seen in the right parietal lobe (Figure 1b). There was no evidence of ventriculitis and the paranasal sinuses and mastoid air cells appeared clear. He was given phenytoin sodium and dexamethasone. On the fourth hospital day he was asymptomatic and on examination only the parietal signs persisted. A new CT scan showed disappearance of the intraventricular haemorrhage (Figure 3). A right carotid angiography was performed showing a right parietal avascular mass and moderate ventricular enlargement. No vascular malformation was identified.

Figure 1 (a) CT scan without contrast and (b): with contrast showing the right parietal lobe abscess.

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Figure 2 CT scan showing intraventricular haemorrhage and hydrocephalus.

Figure 3 CT scan 4 days later showing disappearance of the intraventricular bleeding.

The left upper incisor was removed and the patient underwent a right parietal craniotomy at which an encapsulated mass with purulent contents was removed. Pathological examination revealed a chronic brain abscess. *Peptostreptococcus* and *fusobacterium* grew on cultures and penicillin, 24,000,000 units, and chloramphenicol, 4 g, intravenously per 24 hours were given for one month. He was discharged with minimal left lower limb weakness. Three months later a new CT scan showed only mild hydrocephalus and postsurgical right parietal lobe atrophy.

Discussion

Our case of bacterial brain abscess was interesting because of the coincidental intraventricular haemorrhage. To our knowledge, brain abscess has not been reported as one of the many causes of intracranial haemorrhage.⁵ It is well known that intracranial neoplasms may be complicated by bleeding, presumably from the rupture of blood vessels contained within the tumour.⁵ Unlike tumours, there are no new vessels in the centre of an abscess; however, microscopically, in the earlier stages, an intracerebral abscess consists of an inner layer of pus cells surrounded by a layer of granulation tissue containing hyperplastic fibrous tissue and newly formed blood vessels,² which, potentially, could rupture and be the source of the haemorrhage.

Most parietal abscesses are metastatic, the result of haematogenous spread.^{1,6} In retrospect, the history of

dental infection was important here^{1,3,6,7,8} as *peptostreptococcus* and *Fusobacterium fusiforme* are two well known micro-organisms causing oral infection.⁸ Septic embolism may not only be responsible for metastatic cerebral abscesses, but they may also lodge in small cerebral arteries, infecting and weakening their walls so that mycotic aneurysms result.⁸ These aneurysms can enlarge and rupture or cause multiple infarcts.² However, a right carotid arteriogram did not disclose any mycotic aneurysm so this possibility seems very unlikely, although without full angiography we cannot exclude this mechanism (nor a coincidental berry aneurysm) for the intraventricular bleeding.

In summary, this seems to be the first reported case in which an intracranial haemorrhage complicated an anaerobic, metastatic parietal lobe abscess. Primary or metastatic tumours, granulomatous lesions, resolving haematomas and, more rarely, multiple sclerosis and progressive multifocal leukoencephalopathy can result in the formation of ring-like contrast structures.^{6,7,10-12} In the case of a ring-enhancing mass lesion associated with intracranial bleeding one should not, necessarily, consider a neoplasm. In selected cases, brain abscess, a curable disease, should be excluded too.

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