Carotid cavernous aneurysm in an HIV-positive patient

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Abstract

An intracavernous carotid aneurysm in an HIV-positive patient with tuberculous meningitis is presented. HIV-associated intracranial aneurysms are rarely detected in adults, unlike children. The aetiology is postulated.

Introduction

Cerebral aneurysms are increasingly being detected in children who are seropositive for the human immunodeficiency virus (HIV).[1,2] There has, however, to the best of our knowledge, been only one report in the literature of six adult HIV-positive patients who presented with subarachnoid haemorrhage from berry aneurysms.[3] We present a case of a woman who was HIV-positive and developed an intracavernous carotid aneurysm while being treated for tuberculous meningitis.

Case report

A 27-year-old woman presented with a five-day history of headache, neck pain and confusion. Clinical examination detected a slightly confused patient with a Glasgow coma scale of 14 out of 15, with definite neck stiffness. Lumbar puncture detected 22 polymorphs, 182 lymphocytes, 2 080 red blood cells, elevated protein level and slightly diminished glucose levels. The globulin levels were, however, elevated and the bacterial and cryptococcal antigens were negative.

A clinical diagnosis of tuberculous meningitis (TBM) was made and antituberculous treatment was started. A CT scan was performed on admission to hospital, which demonstrated dilatation of all the ventricles, with basal cistern enhancement consistent with tuberculous meningitis. The hydrocephalus was treated with a ventriculoperitoneal shunt, with CSF pressures returning to normal the next day. The HIV test (ELISA) was positive in a titre of one in 37. No organisms were grown from the cerebrospinal fluid.

On the 4th post-operative day, the patient developed a right 6th cranial nerve palsy. MR imaging performed on the 4th post-operative day demonstrated a right fusiform intracavernous carotid aneurysm on the T2 weighted axial image through the skull base, confirmed by the 3D time of flight sequences (Figures 1a, 1b and 1c). This aneurysm was not identified on the admission CT scan study. The patient's confused state remained unchanged and she suffered a cardio-respiratory arrest and died on the 6th post-operative day. An autopsy was not performed.

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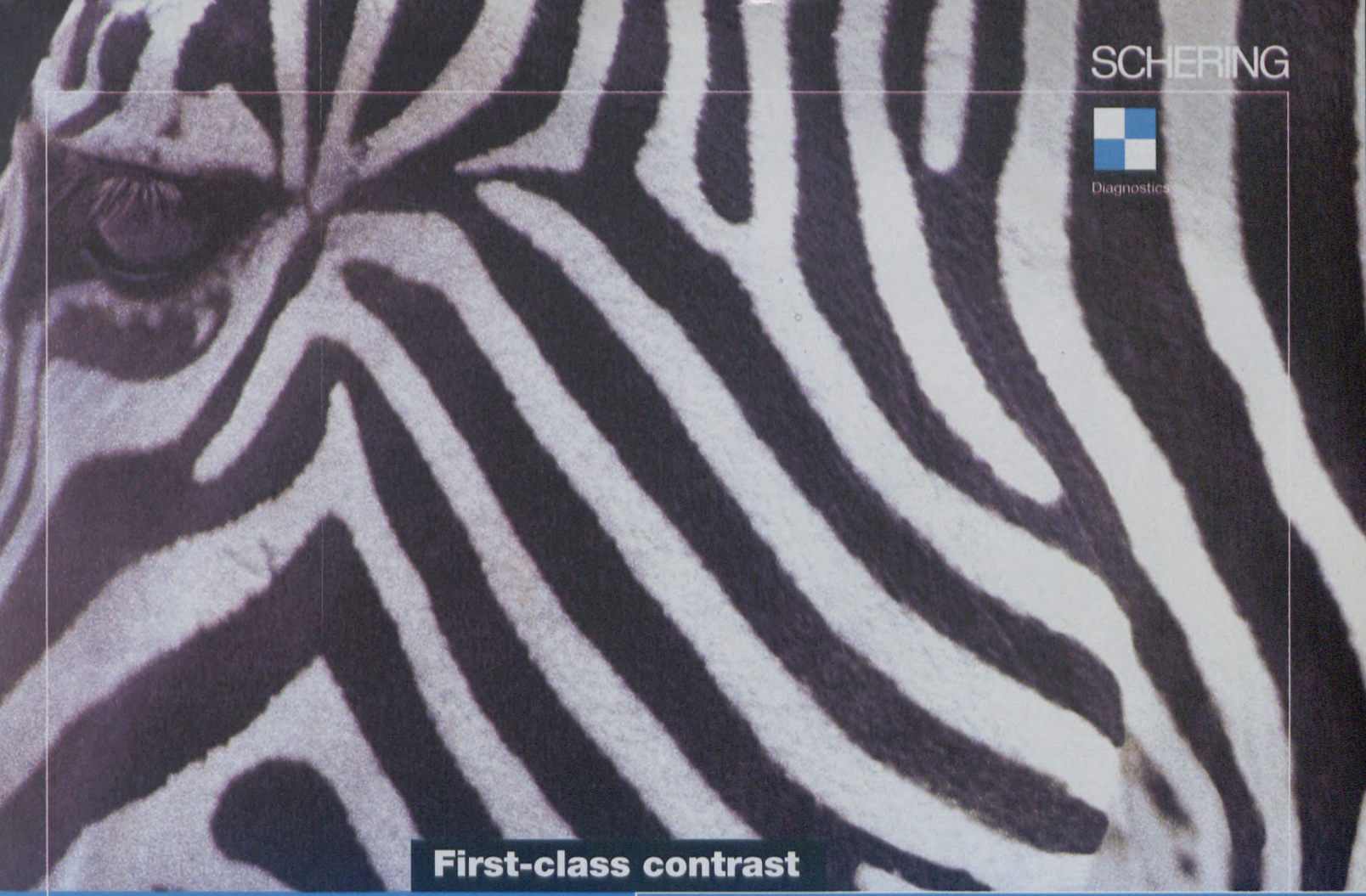

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From seeing to understanding

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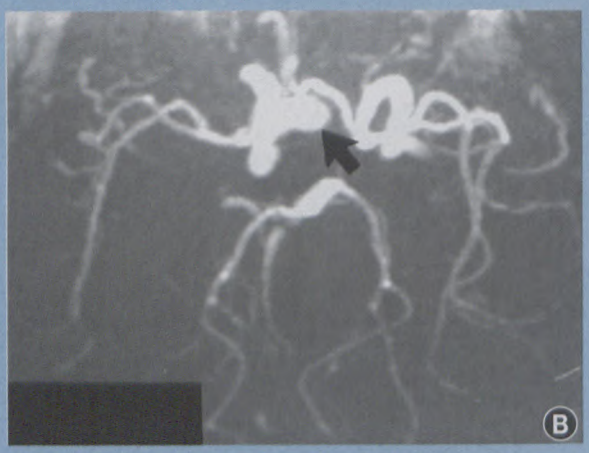
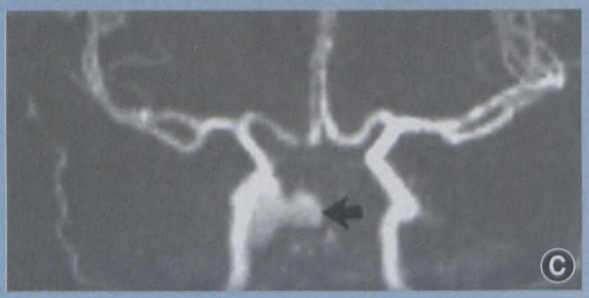
Figure 1a: T2 weighted axial MR scan demonstrates hydrocephalus with a right ventricular peritoneal shunt in situ. Note the aneurysm of the internal carotid artery (arrow).





Figures 1b and 1c: MRA time of flight sequence confirms the right intracavernous carotid aneurysm in the axial and coronal planes (arrows).

Discussion

Vascular complications in patients who are infected with the HIV virus include stroke from small vessel vasculitis, cerebral haemorrhage from thrombocytopenia and intratumoural bleeds, and granulomatous angiitis of the main cerebral arteries.[4,5] This patient developed an aneurysm of the intracavernous portion of the right internal carotid artery that was not identified on the first CT scan. As we do not have pathological proof of the aetiology of the aneurysm in this patient, we can only postulate that it could be due to HIV infection or following tuberculous meningitis. Tuberculous meningitis can cause a vasculitis of small arterioles, resulting in vascular occlusion, although mycotic aneurysms of large arteries such as the internal carotid artery are rare. HIV-associated fusiform cerebral artery aneurysms have been detected by imaging in two out of 250 HIV-positive children presenting for routine imaging.[6] In both these patients the aneurysms were silent, despite progressing to marked dilatation. Fusiform dilatation of the arteries of the Circle of Willis has been described in three children.[4] Pathologically there is an inflammatory vasculopathy resulting in a panarteritis. The arteritis starts in the adventitia and involves the vasa vasorum, resulting in ischaemia of the vessel wall.[4] The ischaemia causes destruction of the elastic lamina and subintimal fibrosis, resulting in fusiform aneurysm formation.[4] Using the monoclonal antibody staining techniques to gp 41, which is the major glycoprotein of the HIV viral membrane, the aneurysm wall demonstrates positive staining of the intima but no staining of the media or adventitia for the viral glycoprotein.[4]

Aneurysms of medium and large arteries such as the common carotid, iliac and femoral arteries have also been recorded in HIV-positive patients.[7] The pathology is identical to the cerebral aneurysms identified with acute and chronic panarteritis with occluded vasa vasora.[7] These aneurysms tend to be multiple.

The natural history of cerebral aneurysms in HIV-positive patients is unknown apart from the one report suggesting rapid growth in size.[6]

Further research is required to determine the true incidence of cerebral aneurysms in HIV-positive patients and to further investigate the aetiology of the pathological changes identified.

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