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Bilateral Dissecting Aneurysms of the Extracranial Vertebral Arteries Associated with Cervical Carotid Artery Aneurysm

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Dissecting aneurysms of the vertebrobasilar system are infrequent. Most of the commonly reported cases describe iatrogenic or traumatic aneurysms of the extracranial vertebral artery. Spontaneous dissecting aneurysms of the extracranial vertebral artery are frequently associated with carotid artery lesions; however, such association is poorly documented in the literature. We describe a case of vertebrobasilar stroke due to dissection of the vertebral arteries associated with a saccular and unruptured mid-cervical internal carotid artery aneurysm.

Case Report

A 44-year-old man with a progressive 1-week history of headache and cervical pain was admitted to our hospital for neurologic investi-

gation. Two days after the onset of the symptoms he became hoarse and had difficulty swallowing. Physical examination revealed a hypertensive patient (180 × 130 mm Hg) with neck stiffness, cervical pain, and paralysis of cranial nerves IX and XII associated with Horner syndrome on the left. CSF and blood chemistry were within normal limits. Plain films of the cervical spine and brain CT showed no abnormality. Selective carotid and vertebral angiography was performed, with special emphasis on the cervical region (Figs. 1–3). Angiograms showed bilateral long stenosis of the extracranial part of the vertebral arteries at the C1–C2 level and aneurysmal dilatation proximal to the site of dissection of the vertebral artery on the left. A saccular and unruptured aneurysm was found at the mid-cervical internal carotid artery. The diagnosis of spontaneous dissecting aneurysms was made on the basis of angiographic and clinical findings, confirmed by a second examination 40 days later. The patient's

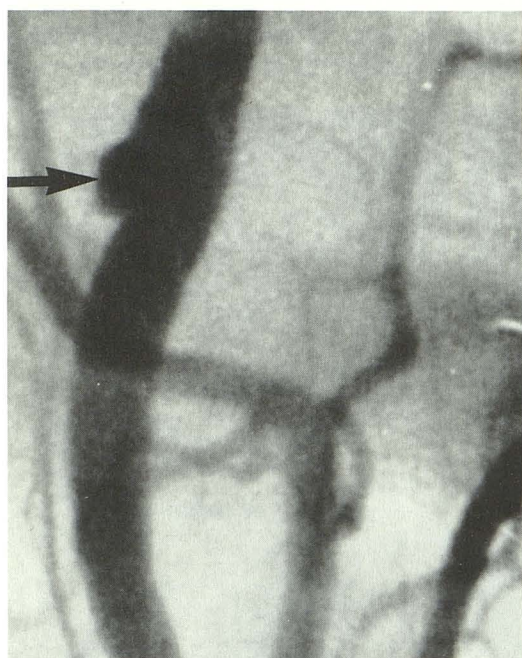
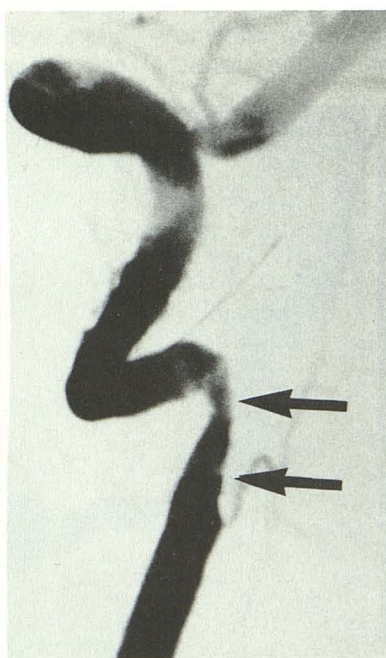
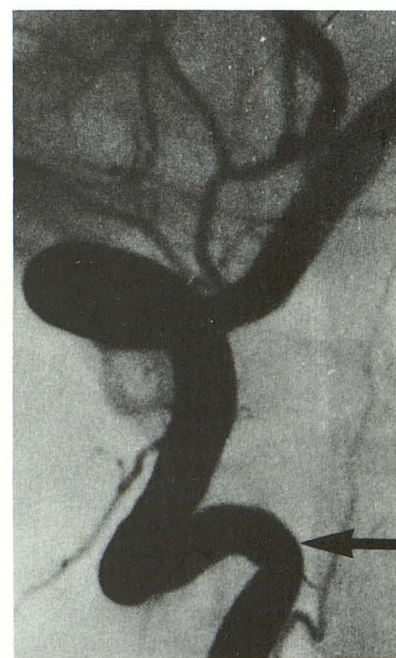


Fig. 1.—Saccular unruptured carotid artery aneurysm (arrow) in left internal cervical carotid artery.



A



B

Fig. 2.—Spontaneous dissection in right cervical vertebral artery at C2 level. A, Oblique view shows the site of dissection, with stenosis of the vessel lumen (arrows). B, Control angiogram 40 days later shows recanalization of the stenotic segment (arrow).

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symptoms resolved progressively, and the stenotic lumen normalized bilaterally.

Discussion

Intracranial and extracranial arterial dissections are more common than usually recognized and, especially when they are found in combination with specific clinical features, should be considered a strong diagnostic possibility in young patients with ischemic stroke and without a clear predisposing cause [1].

Histologic deficits are accepted to be the pathogenesis of intracranial arterial dissections, which have been described as resulting from disruption and splitting of the internal elastic laminae, usually those that communicate with the vessel lumen [2, 3]. Cystic medial degeneration, atherosclerosis, allergic arteritis, syphilis, and periarteritis nodosa are among the known causative factors in the nontraumatic dissections of the intracranial arterial walls [2, 4–6]. Extracranial dissections usually result from dissection within the media or adventitia, where the bleeding source might be the vasa vasorum, which is absent beyond the initial segments of the major intracranial arteries [2, 7]. They usually do not communicate with the vessel lumen.

Dissecting aneurysms of the extracranial vertebral arteries are not an infrequent cause of vertebrobasilar stroke, particularly in young patients, and may be associated with carotid artery lesions in about 30% of the cases reported [4]. Clinically, it is important to take a careful and complete history to exclude trauma, which even though minor, can be relevant.

Posterior headache and cervical pain are the most common symptoms during the days or hours preceding the ischemic stroke, which usually presents as vertebrobasilar transient ischemic attack [1, 4]. Wallenberg syndrome and cranial nerve paralysis are among the clinical symptoms. Although it is infrequent in vertebrobasilar stroke caused by arterial dissections, Horner syndrome was also among the clinical features of the patient reported here. Sometimes, the dissections are related to sports practice, neck rotation, or minor trauma preceding the ischemic symptoms [1, 2].

The angiographic appearance of dissecting vertebral artery aneurysms is poorly documented in the literature. The most common finding is an irregular, eccentric, long stenosis or occlusion of the vertebral artery. Only rarely is the stenosis regular, and demonstration of aneurysmal dilatation is uncommon [1, 4]. The narrowing observed at angiography is termed the "string sign," which may be distinguished from ordinary vasospasm by the presence of mural irregularity [2, 5, 8]. The dissecting aneurysms are most often located at the most mobile segment of the extracranial vertebral arteries, between the C1–C2 levels [1, 4]. It is also interesting to note that this is the most frequently affected segment of the vertebral artery in fibromuscular dysplasia [4].

Aneurysms of any part of the extracranial carotid artery are rare lesions [9–11]. About 48% of them arise from the internal carotid artery [12] and represent 0.34–4.0% of all peripheral aneurysms [9, 11]. Saccular carotid aneurysms most often involve the middle segment of the cervical internal carotid artery, and trauma has been reported as the most common cause of such aneurysms [9, 10]. In cases where trauma is

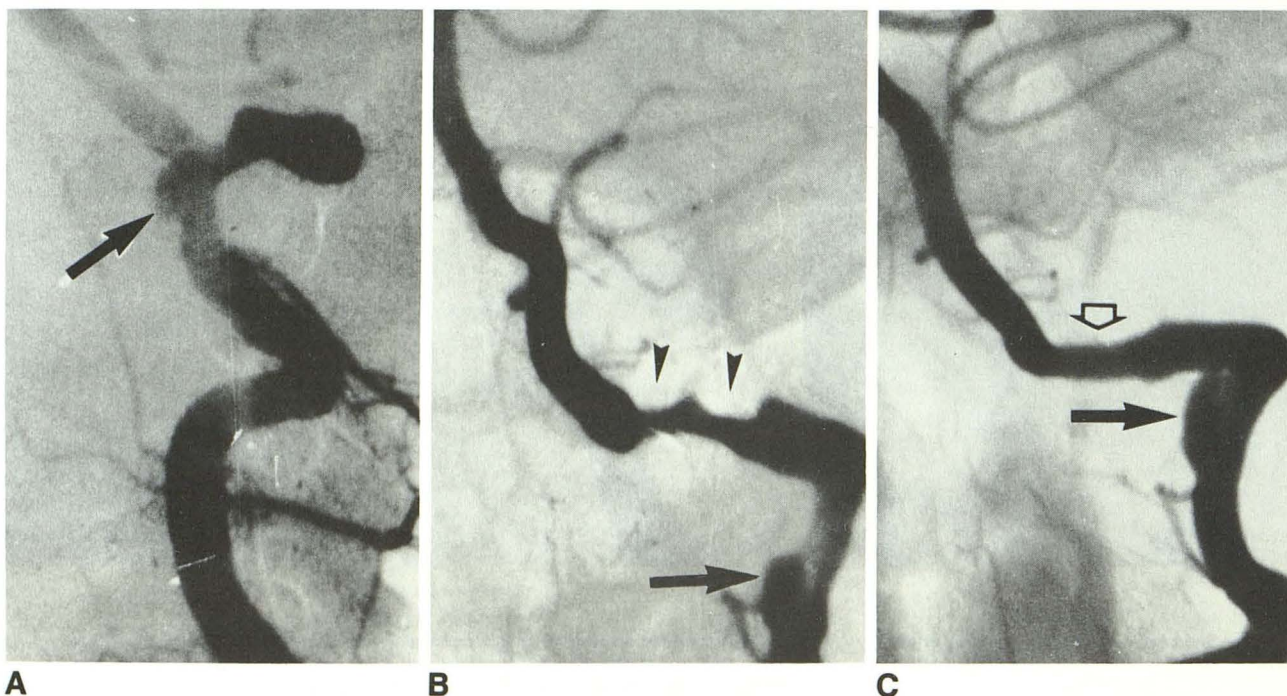


Fig. 3.—Spontaneous dissecting aneurysm of left cervical vertebral artery at C1 level.

A, Oblique view shows an aneurysmal dilatation associated with stenotic segment where the dissection occurred (arrow).

B, Anteroposterior view clearly shows stenotic segment of the artery (arrowheads) and the aneurysmal dilatation (arrow).

C, Control angiogram 40 days later shows recanalization of the vessel lumen (open arrow), but the aneurysmal dilatation still remains (solid arrow).

not implicated, at least involving the spontaneous carotid dissection, viral illness and/or associated violent coughing are sometimes known to be associated.

Bilateral dissections of the extracranial vertebral arteries are rarer [4] but the high frequency of bilateral diseases indicates the need for bilateral vertebral angiography as well as an angiographic study of the carotid and renal arteries, once fibromuscular displasia and hypertension enter the diagnostic considerations. Follow-up angiography may show normalization of the affected vessel lumen, but residual stenosis may remain in 50% of the cases [4]. On the basis of our experience, conservative management is strongly favored in all cases of cervical carotid and vertebral artery dissections [13].

In patients under 45 years old with no predisposing disease and with sudden onset of neurologic deficit preceded or accompanied by headache and or neck pain, arterial dissection should be regarded as a likely diagnosis, and angiography should be performed.

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