A 51-year-old man underwent two percutaneous transluminal angioplasties with stenting for a dissection that extended from the right brachiocephalic trunk into the proximal part of the internal carotid artery. The patient presented with transient dysphasia one month after surgical treatment of a type A dissecting aortic aneurysm. Initially, he was managed with conservative treatment, with no effect on the dissected arteries. Two stents were then successfully placed over the site of dissection to prevent further embolization. At follow-up 29 months after stent implantation, the patient was asymptomatic and ultrasound examination demonstrated no recurrence of dissection at the stented segment. This case suggests that stenting could be a successful treatment of cervical artery dissection.

Key words: adult; aneurism, dissecting; angioplasty, balloon; brachiocephalic trunk; carotid artery diseases; middle age; stents

Cervical artery dissection is one of the most important causes of ischemic stroke in young and middle-aged patients (1). The most frequently involved vessels are the internal carotid artery and the vertebral artery (in up to 90%). The simultaneous dissection of two or more vessels is rarely described (1,2). While the etiology remains unclear, an underlying arteriopathy has often been postulated in spontaneous cervical artery dissection (3). The clinical picture is variable, with either local symptoms like head, neck, or face pain accompanied by Horner’s syndrome or cerebral ischemia with transient ischemic attack or brain infarction. Conventional angiography has traditionally been the diagnostic “golden standard” for cervical artery dissection. More recently, non-invasive methods such as magnetic resonance imaging, magnetic resonance angiography, and ultrasound have been introduced to reach earlier and safer diagnosis. The recommended treatment for an early prevention of neurological deficits includes anticoagulant or platelet antiaggregant therapy (3). In some cases, endovascular stenting or surgical treatment is necessary.

We present a patient with a brachiocephalic trunk dissection associated with ipsilateral common carotid artery dissection, which occurred following a surgical treatment of a dissecting aortic aneurysm type A according to the Stanford classification (4).

Case Report

A 51-year-old man was admitted to the Neurology Department in May 2000, because of right-sided weakness and transient dysphasia. One month previously, the patient had been diagnosed with a type A dissecting aortic aneurysm, originating in the ascending aorta and propagating through the aortic arch and descending aorta all the way down to the left femoral artery. At inspection of the aortic arch, the ostia of all cervical arteries were normal. The aortic valve was intact. He was treated surgically with the resection of the ascending aorta, gluing of the aortic arch, and ascendent aorta prosthesys (Hemashield size 30; Boston Scientific Corporation, Meditech, Natick, MA, USA). Although the operation was successful, the patient developed a compartment syndrome of the left gluteal muscles due to the prolonged presurgical ischemia. Extended ischemic necrosis of these muscles could be noticed as well as postischemic lesion of the sciatic nerve with mild left lower limb paresis. On the first postoperative day, partial resection of the left gluteal muscles was performed. Further postoperative course was uneventful.

The patient was a smoker with a past medical history of hypertension. On admission in May 2000, he was alert and fully orientated; blood pressure was 150/80 mmHg. Physical examination revealed a left gluteal scar from muscle resection, sacral decubitus, and presacral seroma.

Neurological examination revealed reduced power of the left lower limb (Medical Research Council grade 2/5) and asymmetric hypotrophy of the lower limbs (more pronounced on his left limb). Patellar and ankle jerks were decreased on the right side (+1) and absent on the left side (0). Flexor plantar responses were noted. The patient also had hype-
sthesia of the left lower limb, increasing distally, and paresthesias in the area of the left common peroneal nerve. He had no cranial nerve abnormalities. Cardiovascular examination was normal. Cranial magnetic resonance images performed 3 days later showed several small ischemic lesions in the right cortical area. An ultrasound examination of cervicocephalic vessels disclosed a medial dissection extending from the beginning of the right common carotid artery into the proximal part of the right internal carotid artery (Figs. 1 and 2A). A characteristic double lumen was visualized by color Duplex imaging (Fig. 2B). Computed tomography revealed the extension of the dissecting aortic aneurysm into the right common carotid artery. Magnetic resonance angiography showed a long dissection of the brachiocephalic trunk and right common carotid artery with the presence of luminal narrowing (>50%). The left common carotid artery and the left internal carotid artery were normal. Thoracic angiography and selective angiography of both internal carotid arteries confirmed those finding.

The patient was initially treated with 7,500 IU of low-molecular heparin twice daily. An ultrasound examination performed 14 days after the onset of symptoms showed no change to the dissection. To prevent further embolization, vascular surgery or percutaneous transluminal angioplasty (PTA) were recommended. The patient selected the latter treatment, and subsequently underwent two percutaneous transluminal angioplasties with stenting. The first stent was placed in the brachiocephalic trunk and right common carotid artery, and the second one in the right internal carotid artery. No neurological complications occurred. The patient was then transferred to the plastic surgery department for further treatment of sacral decubitus and presacral seroma. Anticoagulation therapy with marcoumar was also initiated. The patient started to improve gradually and partially regained his muscle strength. He was then transferred to the neuro-rehabilitation department. Ultrasound follow-up at 29 months after stent implantation confirmed no recurrence of dissection. The double lumen was not present (Fig. 3) and the patient was free of further neurological events.

Discussion

Dissection of the cervical artery, a frequent cause of ischemic stroke in patients under 50 years (1), may occur spontaneously or after trauma. In the present
case, the dissection extending from the beginning of the brachiocephalic trunk into the proximal part of the right internal carotid artery occurred one month after the surgical treatment of spontaneous dissection of the type A aortic aneurysm. Inspection during the operation, as well as computed tomography (CT) examination performed before the surgical treatment, did not reveal any abnormalities of the cervical arteries. On CT examination one month later, the extension of the dissecting aortic aneurysm to the right common carotid artery was visualized. This suggested that supraaortal dissection probably developed as a spontaneous extension of the type A aortic dissection. In our opinion, this is most likely because the patient's ischemic symptoms and signs of supraaortal dissection manifested one month after the surgical treatment.

The development of non-invasive investigative techniques, such as ultrasound and magnetic resonance imaging, has facilitated earlier and safer diagnosis. The typical ultrasonographic findings (intramural hematoma and double lumen) are rarely seen in the majority of patients (5). In our case, a dissecting membrane with true and false lumen was visualized on longitudinal and transversal sections.

The majority of patients with dissection are successfully treated with anticoagulation or antiplatelet therapy (2). Patients unresponsive to medical therapy may benefit from endovascular stenting or aggressive surgical intervention (e.g., extracranial-intracranial bypass or endarterectomy). Sbarigia et al (6) reported a case where successful stenting prevented further deterioration of neurological signs and symptoms in a patient with a carotid artery dissection that did not respond to conservative treatment. Some studies showed that the patients treated with PTA and stent deployment had a good resolution of dissection-induced stenosis and a very good outcome (7,8). Kubota et al (9) described a patient with an acute aortic dissection type A followed by a common carotid artery dissection, in whom PTA with stenting was successfully performed.

Our patient underwent PTA with stenting across the dissected arterial segment. After insertion of two stents, arteriographic and ultrasound findings were normal and the patient was free of neurological symptoms. On follow-up, there was no sign of dissection recurrence.

The presented case shows that stenting may be a safe, minimally invasive, and effective treatment of patients with extracranial cervical artery dissection where conservative medical treatment has not been successful.

References

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