Spontaneous Dissection in the Common Carotid Artery

—Case Report—

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Abstract

A 60-year-old female presented with a very rare spontaneous dissection in the common carotid artery manifesting as disturbance of consciousness and left dense hemiparesis immediately after swimming. Cerebral angiography showed complete obstruction of the right common carotid artery. Endarterectomy was performed to remove the subintimal thrombus and dissected intima. Blood flow was re-established 4 hours after onset of symptoms. Her disturbance of consciousness was resolved and left dense hemiparesis disappeared completely 12 hours after onset.

Key words: dissecting aneurysm, common carotid artery

Introduction

Reports of spontaneous dissection in the cervical internal carotid artery have increased gradually in frequency since the first case in 1959, showing that it is not a rare disease.^{1,2,5,6,8,11,13-15,17} The clinical profile is now well known. The intima is generally free of arteriosclerotic lesions. Instead, entry of blood into the dissected media forms a hematoma, which in turn obstructs the carotid lumen, leading to ischemic symptoms of the brain. The cause may involve cervical overstretching during sports or finger-pressure therapy.^{4,7,16} In contrast, relatively little is known of spontaneous dissection in the common carotid artery.

We describe a patient with spontaneous dissection in the common carotid artery manifesting as onset of ischemic symptoms of the brain.

Case Report

A 60-year-old female suddenly suffered disturbance of consciousness and left dense hemiparesis immediately after swimming, and was admitted to our hospital 20 minutes later. On arrival, she was semicomatose and had left dense hemiparesis. Her past history was noncontributory except for mild hypertension.

Fig. 1 Head CT scans on admission showing no abnormality.

Computed tomography (CT) of her head revealed no abnormality (Fig. 1). Cerebral angiography showed widening, wall irregularity, and complete obstruction of the right common carotid artery (Fig. 2). We suspected that a thrombus from the heart had obstructed the common carotid artery, and therefore administered 300,000 units of urokinase i.a. Repeat angiography of the right common carotid artery showed severe stenosis from the site of bifurcation to a site 3 cm proximal (Fig. 3). Angiographic visualization progressed, although very slowly, from the internal carotid artery to the intracranial vessels, but her symptoms were not ameliorated.

We therefore performed emergency endarterec-

Fig. 2 Cerebral angiogram before the administration of urokinase, showing complete obstruction of the right common carotid artery (arrow).

Fig. 3 Cerebral angiogram after the administration of urokinase, showing severe stenosis remaining at the site of bifurcation (arrow).

tomy to remove the thrombus, hoping to ameliorate the symptoms and reduce the risk of extensive cerebral infarction. Incision of the right common carotid artery discovered no thrombus in the lumen

Fig. 4 *upper*: Intraoperative photograph showing an intramural thrombus (arrow), and the elevated intima (arrowheads). *lower*: Intraoperative photograph showing complete removal of dissected intima and thrombus. E: elevated intima remaining at the bifurcation which was used to attach sutures.

of the artery, but the intima was markedly elevated. Incision of the elevated intima revealed a soft and red thrombus (Fig. 4 *upper*). The common carotid artery was incised only to the proximal end of the thrombus, but the wall dissection extended further proximally along the common carotid artery. The distal end of the wall dissection reached the bifurcation of the common carotid artery. There was no re-entry of the lumen of the artery at this distal end. The dissected intima and thrombus were removed (Fig. 4 *lower*), and the clip on the common carotid artery was temporarily released to confirm blood flow. The wound of the common carotid artery was then closed with 6-0 nylon sutures. Blood flow was re-established 4 hours after the onset of symptoms. Histological examination of the intima specimen revealed dissection between the media and adventitia, but no arteriosclerotic changes in the intima.

Her disturbance of consciousness resolved immediately after surgery. Left hemiparesis disappeared completely 12 hours after the onset. Postoperative CT of her head revealed no abnormality.

Discussion

Dissection in the common carotid artery may be induced by penetrating injuries or direct percutaneous carotid angiography. In one case, dissection occurred through erroneous puncture of the common carotid artery during the placement of an internal jugular vein catheter.⁹⁾ However, the most frequent cause of common carotid artery dissection is extension of dissecting aneurysms of the thoracic aorta, occurring as the causative factor in 75 of 398 cases.¹²⁾

Spontaneous dissection in the common carotid artery has been reported in only two cases.^{3,10)} Bashour *et al.*³⁾ described a case history of dissecting aneurysms of the thoracic aorta. The cause of spontaneous dissection is unknown, but the media is the main location of lesions. In our case, the intima was completely free from arteriosclerotic changes. The occurrence immediately after swimming suggests possible involvement of violent cervical movements. Therefore, spontaneous dissection in the common carotid artery may occur through a mechanism similar to that of spontaneous dissection in the cervical internal carotid artery.

Dissection in the internal carotid artery is accompanied by headache, cervical pain, hemiparesis, or aphasia, but dissection in the common carotid artery generally remains asymptomatic.^{12,18)} Our patient and the two previously reported patients^{3,10)} had ischemic symptoms, but these were secondary to hypoperfusion resulting from a narrowed or obstructed true lumen. Interestingly, one patient complained of chest pain,¹⁰⁾ as our patient told us postoperatively that she had experienced anterior chest discomfort at the onset. Dissection involving the region near the origin of the common carotid artery may result in thoracic pain or anterior chest discomfort even in the absence of thoracic aorta dissection.

Spontaneous dissection in the cervical internal carotid artery resulting in vascular stenosis or obstruction frequently resolves spontaneously within 6 weeks.¹¹⁾ The rate of spontaneous remission is as high as 87% or 90%.^{8,11)} As recurrence is rare among such patients, asymptomatic cases do not need special treatment. However, patients with ischemic symptoms of the brain require medical or surgical treatment. Medical treatment often includes administration of anticoagulant agents such as heparin to prevent thromboembolic phenomena and thrombolytic agents such as urokinase to recanalize the obstructed vessels. However, the use of these agents is controversial. Some investigators feel that anticoagulant or thrombolytic agents should not be

used because the carotid artery dissection process may be accelerated.¹²⁾ Our patient is the only reported case of common carotid artery dissection treated with urokinase.

Previous cases of common carotid artery dissection have been treated surgically. Bashour *et al.*³⁾ performed endarterectomy and obtained favorable results. Graham *et al.*¹⁰⁾ ligated the common carotid artery at a site proximal to the lesion, cut off the dissected portion of the artery, and connected the distal end with the subclavian artery using an artificial vessel, obtaining favorable results as well.

Initially, we suspected that a thrombus from the heart had obstructed the common carotid artery in our patient, and administered urokinase. The urokinase apparently dissolved the thrombus in the pseudo-lumen, leading to a slight recanalization of the true lumen. In this sense, urokinase was very effective. However, we felt surgery was necessary because of the severe stenosis remaining at the bifurcation and the persistent ischemic symptoms of the brain. An extracranial-intracranial bypass was not indicated because the stenosis involved the common carotid artery. The dissection in the common carotid artery was finally diagnosed during the endarterectomy procedure, allowing the intramural thrombus to be removed.

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