

Chapter XI – S. Braccard

Spontaneous dissections of cervical and intracranial arteries

*Serge Bracard, René Anxionnat, Jean Christophe Lacour, Ariel Lebedinsky,
Francesco Ramos, Stephanos Finitis, Luc Picard
Department of Diagnostic and Interventional Neuroradiology
Hôpital Neurologique, CHU de Nancy, Nancy, France*

DISSECTIONS OF CERVICAL ARTERIES

Cervical artery dissection is one of the most frequent causes of stroke. The annual incidence of spontaneous carotid-artery dissection is ranged from 2.5 per 100,000 to 3 per 100,000.

Dissections of the carotid and vertebral arteries usually arise from an intimal tear that allows blood to enter the wall of the artery and to form an intramural hematoma. This hematoma is located within the layers of the tunica media, but it may be eccentric. A subintimal dissection tends to result in stenosis of the arterial lumen, whereas a subadventitial dissection may cause aneurismal dilatation of the artery.

Clinical Manifestations

Patients with carotid artery dissection typically present unilateral facial and cervical pain accompanied by a partial Horner's syndrome and followed hours or days later by cerebral or retinal ischemia. Cranial-nerve palsies can be detected in more than 10 percent of patients. The lower cranial nerves are the most commonly affected, particularly the hypoglossal nerve.

Patient with vertebral-artery dissection typically present pain in the back of the neck or head. Ischemic symptoms occur in more than 90 percent of patients. Transient ischemic attacks are less frequent after vertebral-artery dissections than after carotid-artery dissections.

Imaging

In about 15 to 25% of patients, dissections are detected in two or more vessels, and these multivessel dissections often appear to have occurred at the same time.

Magnetic resonance techniques are replacing conventional angiography as the gold standard in the diagnosis of dissections of the carotid and vertebral arteries, for it may display the intramural hematoma itself as a crescentic shape adjacent to the vessel lumen and often spiraling along the artery. Fat-suppression techniques are important to differentiate intramural hematomas from the surrounding soft tissues. Ultrasonographic techniques are useful in the initial assessment, an abnormal pattern of flow is identified in more than 90 percent of patients

Prognosis

The reported rate of death from dissections of the carotid and vertebral arteries is less than 5 percent. The local evolution is usually good: about 90 percent of stenosis eventually resolve, two thirds of occlusions are recanalized, and one third of aneurysms decrease in size. This improvement takes place largely within the first two to three months after the dissection and is rare after six months. Persistent extra cranial aneurysms may exceptionally cause thromboembolic complications, but they never rupture.

In our French multicentric study (432 patients, mean follow-up of 31 months), the risk of a recurrent dissection is about 1% and the risk of recurrent ischemic stroke is also about 1 percent particularly during the first month.

Treatment

To prevent thromboembolic complications, anticoagulation with intravenous heparin followed by oral warfarin for three to six months has been recommended for all patients with acute dissections of the carotid or vertebral artery.

Endovascular treatment, consisting of percutaneous balloon angioplasty and placement of one or more metallic stents, has supplanted surgery as the initial therapy of choice once medical therapy fails. If needed in emergency, cervical angioplasty may be combined with intra arterial thrombolysis. Later, aneurysms may be treated by covered or uncovered stents, however this treatment is seldom necessary and the long-term results of carotid stenting are unknown.

DISSECTION OF INTRA CRANIAL ARTERIES

The real incidence of SAH due to a dissecting aneurysm rupture is unknown and is probably underestimated. For histologic reasons the great majority of intracranial dissections related to SAH are located in the posterior circulation. Despite the attention paid to this pathology in the past years the published series remain short and there are still no consensus in the management of this group of patients. Several series report a high rate of rebleeding especially in pseudoaneurysmal types. Most of these rebleedings occur in the first few days after the haemorrhage and early treatment is thus recommended.

Our study involved a retrospective review of 27 patients with 29 dissections treated over a 16-year period mainly by endovascular treatment (EVT).

Endovascular treatment was performed in the acute stage in 12/29 dissections, occlusion was performed using coils at the dissection site in 6 and with proximal balloon occlusion in 6. Wrapping was performed in one case. 16 dissections were not treated mainly for anatomical reasons. In this group, 3 patients died, one of them from rebleeding. Angiographic follow-up performed in the 13 surviving patients demonstrated initially misdiagnosed lesion in 1 and worsening lesions in 5 which led in delayed EVT in 5 and surgical clipping in 1. One of these dissections located on a dominant vertebral artery was treated after a subsequent rupture using a stent and coils to preserve the patency of the parent vessel. Four ischemic complications related to EVT resulted in a moderate disability in 2 patients. No rebleeding occurred after EVT, 1 patient died due to a poor initial clinical status, other patients improved. In the 10 patients conservatively treated, 4 patients died, 3 from a poor initial clinical status, 1 from rebleeding and 6 had a good clinical outcome. Of the 27 patients, 3 had a rebleeding and 1 died from this rebleeding. Seventeen patients (63%) had a good recovery, 6 (22%) had a moderate disability and 4 (15%) died.

Conclusion: EVT provides effective protection against rebleeding. Occlusion with coils at the dissection site, when possible, is the current method of choice. Other options are parent artery occlusion with balloons, while the use of stent may allow to preserve the permeability of the vessel in specific cases.