Spontaneous Internal Carotid Artery Dissection Presenting as Hypoglossal Nerve Palsy

Graham J. Lieschke, MBBS, Stephen Davis, MD, FRACP, Brian M. Tress, FRACR, FRCR, and Peter Ebeling, MD, FRCP, FRACP

A 42-year-old man presented with right temporal headache, dysarthria, and dysphagia. On examination, he had a right hypoglossal nerve palsy. The diagnosis of right internal carotid artery dissection was suggested by magnetic resonance imaging and confirmed by carotid angiography. A dynamic computed tomogram demonstrated enlargement of the carotid artery. In carotid dissection, the hypoglossal nerve may be compromised by local factors as it passes close to the carotid artery in the neck. (Stroke 1988; 19:1151-1155)

Summary

Spontaneous dissection of the extracranial arteries has attracted increased attention in recent years, particularly as a cause of stroke in young people.1-4 The clinical syndrome classically includes focal unilateral headache or neck pain, oculosympathetic paralysis, focal cerebral deficits, visual symptoms, and bruits. Characteristic appearances are recognized at angiography1-3,4 and at computed tomography (CT scanning).5 We report a case in which a proven internal carotid artery (ICA) dissection presented in an unusual manner as a hypoglossal nerve palsy.

Case Report

A 42-year-old man presented with headache, speech disturbance, and difficulty swallowing. He was previously well, had a remote past history of pericarditis, and had been taking pindolol for mild hypertension. He drank alcohol and smoked tobacco in moderation.

Six days before presentation, while lifting heavy concrete blocks, he experienced a sudden onset of right temporal headache with pain behind his right eye radiating to his right ear. There was no photophobia, neck stiffness, or visual disturbance. Over the next 2 days, the pain eased but did not resolve; it seemed worse while lying down and on moving his right eye. Three days after the onset of headache, he found that he was unable to swallow a dry biscuit because his tongue seemed uncoordinated. From that time, his speech was slurred, and he described his tongue as "a damn nuisance."

On examination, he was a 90-kg, well-built man of normal body habitus with a mild dysarthria. His blood pressure was 140/90 mm Hg. His cardiorespiratory system was normal. There were no cervical bruits. On neurologic examination, the major abnormality was that his tongue appeared asymmetrical at rest and there was a right hypoglossal palsy. The gag reflex was absent, and nasal escape could be demonstrated. Palatal, lingual, and buccal sensation were intact, and taste sensation was normal over his entire tongue to standard solutions and galvanic stimulation. There was no evidence of a Horner's syndrome, long-tract limb signs, or cerebellar deficits.

The combination of headache and bulbar dysfunction was taken to indicate the presence of posterior circulation or medullary pathology. CT scan showed no evidence of subarachnoid or cerebral hemorrhage. The cerebrospinal fluid (CSF) was clear, colorless, and under normal pressure, with 3 lymphocytes/mm³. CSF protein concentration was 0.82 (normal < 0.04) g/l. Results of routine biochemical and hematologic tests were normal, but magnetic resonance imaging (MRI) showed a strong signal on T1- and T2-weighted images suggesting occlusion or severe stenosis of the right ICA (Figures 1 and 2). The suspected diagnosis of right ICA dissection was confirmed at subsequent selective carotid angiography by the demonstration of the classic "string sign" (Figure 3). An incremental dynamic CT scan of the neck6 was performed to examine the ICA in the vicinity of the...
hypoglossal nerve; at this level the artery appeared considerably enlarged (Figure 4). The enlargement corresponded to the site of marked tortuosity demonstrated on the sagittal MRI study (Figure 1, top).

In view of the benign natural history of this condition,1 the patient's minimal and resolving deficit, and his late presentation, he was not anticoagulated. Follow-up angiography 5 months later, performed when he had an episode of further headache and transient dysarthria, showed that the ICA had not recanalized.

**Discussion**

The neurologic deficits following carotid dissection are presumed to result from a number of mechanisms1-5: 1) ischemia due to the direct interruption of the cerebral circulation by the luminal stenosis, 2) antegrade propagation of thrombus, 3) embolism, 4) disruption of the perivascular sympathetic fibers as the dissecting artery swells, causing the oculosympathetic paresis.

The syndrome of ICA dissection with hypoglossal palsy suggests that local factors may also
contribute to the neurologic deficit. We are aware of only two other reported cases\textsuperscript{2,7} associating lingual motor paresis (as distinct from dysgeusia) with ICA dissection in the neck. Fisher et al\textsuperscript{3} described persisting tongue weakness in a patient presumed to have suffered a dissection 9 weeks previously, although angiography had not been performed. In our case, we propose that the dissection compromised the function of the hypoglossal nerve by local compression. The focal enlargement and tortuosity of the ICA, demonstrated by MRI and CT scanning at this level, supports this hypothesis. Furthermore, the palatal weakness (evidenced by nasal escape and dysarthria) suggests that the pharyngeal branch of the vagus nerve, which also passes close to the ICA,\textsuperscript{8} was compromised by a similar mechanism. The relevant anatomy is shown in Figure 5. In the second reported case,\textsuperscript{7} carotid dissection with tongue weakness was associated with glossopharyngeal, vagal, and accessory nerve dysfunction. It is likely that these other nerve palsies were due to local compression by an expanded ICA in the neck.

MRI appearances of carotid dissection have been described in two patients, 12 and 16 days after the dissection.\textsuperscript{7} In our case, a hyperintense signal from the carotid artery on T1- and T2-weighted images...
was observed 10 days after dissection. It remains to be shown just how early these appearances develop. It would be expected that the arterial wall hematoma would initially be slightly hypointense on T1-weighted images and markedly hypointense on T2-weighted images by analogy with intracerebral hemorrhages, although slow blood flow may cause a strong signal in the early period.7

From a practical viewpoint, this syndrome should be borne in mind when dysfunction of the hypoglossal and other lower cranial nerves is observed in the context of a possible dissection, as the clinical picture might suggest a lesion of the vertebrobasilar territory. In addition to angiography, MRI and dynamic CT scanning are useful imaging modalities to assist in making this diagnosis.

Acknowledgments

The authors thank Arthur Wigley for assistance in preparation of the photographs, Dr. G. Kenny and Peter Maltezos for assistance in preparation of the illustration, and Mena Luciani and Rifa Ibrahim for assistance in preparation of the manuscript.

References


KEY WORDS • carotid artery diseases • hypoglossal nerve • magnetic resonance imaging
Spontaneous internal carotid artery dissection presenting as hypoglossal nerve palsy.
G J Lieschke, S Davis, B M Tress and P Ebeling

Stroke. 1988;19:1151-1155
doi: 10.1161/01.STR.19.9.1151

The online version of this article, along with updated information and services, is located on the World Wide Web at:
http://stroke.ahajournals.org/content/19/9/1151

Permissions: Requests for permissions to reproduce figures, tables, or portions of articles originally published in Stroke can be obtained via RightsLink, a service of the Copyright Clearance Center, not the Editorial Office. Once the online version of the published article for which permission is being requested is located, click Request Permissions in the middle column of the Web page under Services. Further information about this process is available in the Permissions and Rights Question and Answer document.

Reprints: Information about reprints can be found online at:
http://www.lww.com/reprints

Subscriptions: Information about subscribing to Stroke is online at:
http://stroke.ahajournals.org/subscriptions/