A diagnosis of cerebral thrombosis was made in this 74-year-old man who presented with speech and gait disturbances. On admission he was completely conscious and fully oriented, but manifested right-sided homonymous hemianopsia, mild right-sided hemiparesis, and aphasia. Computerized tomography (CT) scanning of the brain revealed left frontal and parietooccipital infarctions. Right vertebral artery (VA) angiography demonstrated a hypoplastic VA; the basilar artery (BA) and the posterior inferior cerebellar artery were not seen. Right carotid artery angiography revealed a persistent primitive hypoglossal artery (PPHA) originating from the cervical portion of the internal carotid artery at the C-2 level (Fig. 1). The posterior communicating artery and the left VA were not visualized. Left carotid artery angiography proved to be unremarkable.

Three-dimensional (3-D) CT angiography provided a particularly clear view of the PPHA as it penetrated the hypoglossal canal and joined the lower portion of the BA (Fig. 2). The PPHA arises from the internal carotid artery at the level of C-1 or C-2 and runs parallel to the cervical spine before curving rostrally, with its convexity at the base of the skull, to enter the cranial cavity through the hypoglossal canal.1–4 The PPHA then passes medially and rostrally to the BA, where it terminates. The prevalence of PPHAs in cerebral angiograms has been reported to range from 0.027 to 0.26%.1–4 Although the diagnosis of PPHA has been made most often by using cerebral angiography, such studies are not ideally suited to defining the foramina at the base of the skull. Kamisasa, et al.,3 have emphasized that carotid artery angiography should include axial projections to facilitate diagnosis of a PPHA. With the increasing availability of 3-D CT angiography and experience in its interpretation, this imaging technique is becoming widely established as the examination of choice in many neurosurgical disorders. In the present case, 3-D CT angiography readily visualized the PPHA as it coursed rostrally along the anterior rim of the foramen magnum after passing through the hypoglossal canal; thus, the technique provides a highly useful demonstration of anatomical relationships.

References

Fig. 1. Anteroposterior (left) and lateral (right) right carotid artery angiograms revealing the PPHA.

Fig. 2. Anteroinferior (left) and posterosuperior (right) 3-D CT angiograms revealing the PPHA as it transverses the skull via the hypoglossal canal.