Unilateral Absence of the Basal Ganglia on ¹²³I-Ioflupane DaTScan

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Abstract: This 33-year-old man presented with hemorrhagic stroke manifesting with left hemiparesis and right ptosis. Angiography revealed no patent carotids. The anterior and middle cerebral arteries were filling collaterally through the posterior vertebrobasilar pathway. The presumptive diagnosis was moyamoya disease. The etiology of the bleeding was right basilar tip aneurysm that subsequently had partial coil placement. Months later, the neck of the aneurysm perforated and second coiling was performed. Later on follow-up, patient developed left hand tremor. A radionuclide DATscan revealed total absence of right-sided basal ganglia activity. A possible etiology was occlusion of the middle cerebral artery's lenticulostriate branches.

Key Words: basal ganglia, ¹²³I-ioflupane, DATscan, moyamoya, stroke, ischemia (*Clin Nucl Med* 2019;44: 842–843)

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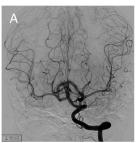






FIGURE 1. Posteroanterior view of a digital subtraction angiogram of the left vertebral artery (A) demonstrates large posterior cerebral arteries feeding the bilateral anterior circulation due to bilateral carotid artery occlusions. The etiology of the carotid occlusions was felt to likely be due to moyamoya disease. ^{1–3} Transporter function available from the ¹³¹I-ioflupane (DAT) scan has provided an invaluable diagnostic tool to assist in distinguishing Parkinson disease from other possible etiologies associated with tremors. 4-7 One other previously reported DAT scan showed unilateral absence of caudate uptake in a patient with a hand tremor.8 The current case shows total unilateral absence of both caudate and putamen functions. Magnified caudally angulated view of the left vertebral artery (B, arrow) shows a recurrence of the previously coiled basilar tip aneurysm at the neck with a maximal dimension of 5×3 millimeters. Such aneurysms are often associated with moyamoya disease. The aneurysm was successfully treated with 2 detachable coils (C).

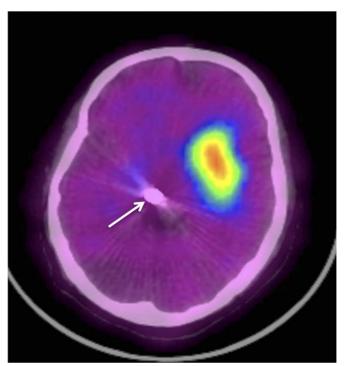


FIGURE 2. Transaxial SPECT image from a ¹³¹I-ioflupane (DAT) scan shows total absence of caudate or putamen activity on the right. This is often due to an occlusion of the lenticulostriate branches of the right middle (and possibly, anterior) cerebral arteries. These vessels constitute the major blood supply of the basal ganglia. ¹⁰ The metallic coil is seen to the right of midline (arrow). The DAT scan has evolved into a major diagnostic tool for the diagnosis of movement disorders.