We present a 71 year old woman with predominantly right sided parkinsonism of sudden onset, but without tremor. Magnetic resonance imaging (MRI) depicted lesions affecting the substantia nigra (SN) bilaterally, but more pronounced on the left side. There were no other discernible structural lesions. Using positron emission tomography (PET), we investigated regional cerebral metabolic rate of glucose (rCMRG) using the tracer [18F]-fluorodeoxyglucose (FDG), and striatal dopa decarboxylase capacity using the tracer [18F]-L-6-fluorodopa (FDOPA). The degree and pattern of distribution of FDOPA uptake reductions (putamen> caudate nuclei) were similar to those in idiopathic Parkinson's disease (PD). FDG uptake also revealed similar changes (reductions in frontal cortex and cerebellum, but increases in thalamus), except for putamen which showed reduced rCMRG. In conclusion, the absence of tremor at rest accords with experimental SN lesions. The PET findings in this atypical condition are explained in terms of deafferentation of various brain regions involved in motor control. Furthermore, they illustrate the metabolic effects related to acute focal lesions of the SN as opposed to the progressive degeneration in idiopathic PD and may serve to help unravel the complicated pathophysiology underlying these conditions.