

**Different effects of supra-nuclear and sub-nuclear vascular lesions on clinical and imaging findings in a case of vascular parkinsonism**

*Simone Valente*<sup>1,2</sup>, F. Piattellini<sup>1,2</sup>, S. Mombelli<sup>1,2</sup>, D. Greco<sup>1,2</sup>, G. Grigioni<sup>2</sup>, L. Caremani<sup>2</sup>, A. Govoni<sup>2</sup>, A. Lombardo<sup>1,3</sup>, M.T.R. De Cristofaro<sup>3</sup>, A. Bianchi<sup>4</sup>, S. Ramat<sup>2</sup>

<sup>1</sup>Department of Neurosciences, Psychology, Pharmacology and Child Health, University of Florence, Florence, Italy

<sup>2</sup>Parkinson Unit, Department of NeuroMuscular-Skeletal and Sensorial Organs, Azienda Ospedaliero Universitaria Careggi, Florence, Italy

<sup>3</sup>Nuclear Medicine Unit, Department of Experimental and Clinical Biomedical Sciences "Mario Serio", University of Florence, Florence, Italy

<sup>4</sup>Department of Neuroradiology, Azienda Ospedaliero Universitaria Careggi, Florence, Italy

*Introduction:* Vascular parkinsonism is a form of atypical parkinsonism due to vascular lesions in the basal ganglia or in the nigrostriatal pathway. The most common clinical features are postural instability, gait impairment, absence of tremor, lower limbs rigidity and lack of response to L-dopa therapy. Ioflupane-SPET usually shows a preserved or mildly reduced only degree of striatal radiotracer uptake.

*Objective:* We present the case of an 87-years old woman with a diagnosis of extrapyramidal disorder and the complete absence of radiotracer uptake in the left striatum in Ioflupane-SPET due to a sub-nuclear vascular lesion.

*Methods:* Since the beginning of her clinical history, the patient underwent neurological examination, MRI and SPET studies.

*Results:* The patient has been suffering from hypercholesterolemia and hypertension and had a transitory ischemic attack, so she has been regularly taking cardiovascular secondary prevention treatment. At the age of 82 years, she started to have postural instability, gait impairment, mild rigidity and bradykinesia in her right limbs and signs of mild cognitive impairment. L-dopa therapy was then started without significant clinical benefit. CT scan showed diffuse vascular leukoencephalopathy. Ioflupane-SPET revealed markedly reduced uptake in the left striatum, which appeared to correlate with slightly right-predominant motor signs, while normal FP-CIT uptake was present in the right striatum. A brain MRI was then performed which showed chronic vascular leukoencephalopathy and a left subnuclear lacunar infarct. At the last follow-up visit in January 2023, despite stopping levodopa therapy, her neurological signs and symptoms remained stable, suggesting a probable form of vascular parkinsonism.

*Conclusion:* This is an explicative example of how supra and sub-nuclear vascular lesions may cause different symptoms and Ioflupane-SPET findings. In particular, subnuclear vascular lesions may provoke the loss of dopaminergic neuronal terminals resembling that of the neurodegenerative disorders such as Parkinson's disease.