Tumoural denervation of the nigrostriatal pathway

Martin Victor Añaños · Teresa Baringo ·
Paola Lievano · Leticia De la Cueva · Pablo Navarro ·
Estela Arroyo · Mario Gonzalez · Dolores Abos

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A 22-year-old woman, diagnosed 7 years ago with low-grade astrocytoma in the left mesencephalon, presented with an initial clinical picture of severe intention and resting tremor in the right limbs.

The tumour was treated with radiation therapy, and currently no signs of progression appear in the radiological control examinations, although the symptoms still persist and prevent the patient from carrying out daily activities.

The last radiological exam (A) showed a calcified tumour in the left thalamus and mesencephalon, without structural affectation in the basal ganglia, so a functional assessment of the nigrostriatal system through a combined study of presynaptic dopamine transporters and postsynaptic D₂ receptors was performed [1].

The study performed with [¹²³I]FP-CIT SPECT (B) shows absence of uptake in the left striatum and preserved uptake in the contralateral one. These findings suggest the existence of an interruption of the left nigrostriatal connections, with integrity of the right nigrostriatal pathway, consistent with the anatomical location of the tumour [2].

The study of D₂ receptors with [¹²³I]IBZM SPECT (C) demonstrates intense uptake of the radiotracer in the left striatum and normal uptake in the right D₂ postsynaptic receptors.

The discrepancy between the study of receptors and transporters can be explained by upregulation of the left postsynaptic D₂ receptors [3, 4], secondary to denervation of the left nigrostriatal connections by the expansive process in the mesencephalon.

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M. V. Añaños (✉) · T. Baringo · P. Lievano · L. De la Cueva ·
P. Navarro · E. Arroyo · M. Gonzalez · D. Abos
Department of Nuclear Medicine,
Hospital Universitario Miguel Servet,
P. Isabel la Católica 1-3.,
50009 Zaragoza, Spain
e-mail: martin-victor@hotmail.com