LETTER TO THE EDITOR

PPN or PPD, what is the target for deep brain stimulation in Parkinson’s disease?

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Sir, I have read with much interest the recent article published by Palolo Mazzone and co-workers in Brain (Bilateral deep brain stimulation of the pedunculopontine and subthalamic nuclei in severe Parkinson’s disease by Stefani et al., Brain, 2007, doi:10.1093/brain/awl346) in which improvement of axial parkinsonian symptoms are obtained by deep brain stimulation of the PPN. Considering the impact that this important article will certainly have in the Neuroscience scientific community as well as, most importantly, in the domain of the Neurosurgical treatment of Parkinson’s disease, I would like, however, to make the following comment.

In their Figure 2, entitled ‘Schematic representation of PPN implantation sites’, the authors show the cerebral structure that they targeted in the Schaltenbrand atlas in saying ‘the PPN-targeted region was emphasized in cyan’. The frontal section that is illustrated corresponds to the level Fp 13.0 of the atlas of Schaltenbrand and it is quite embarrassing to see that the region emphasized in cyan in their figure is labelled ‘Ppd’ in the atlas, which corresponds to the ‘nucleus peripeduncularis’ not the pedunculopontine nucleus. The pedunculopontine nucleus appears in the Schaltenbrand atlas as the ‘Tg.pdpo’ for ‘Nucleus tegmenti pedunculo-pontinus’ and appears at the more caudal sections Pf 15.5 and 16.5. In these sections, it is localized, as the PPN is known to be, just lateral to the decussation of the brachium conjunctivum (B.cj in the atlas) and medial to the medial lemniscus. The cyan region in the sagittal section also corresponds to the label ‘Ppd’ in the atlas.

If electrodes are actually implanted in this targeted region, which seems likely owing to the 11–12 mm laterality, therefore they are localized more rostrally and more laterally than the PPN which appears at 7–8 mm lateral in sections Fp 15.5 and 16.5 of the atlas. The peripedunclar nucleus or Ppd borders the lateral and caudal part of the substantia nigra. Its neuronal constitution is not precisely defined in the textbooks (laterally located dopaminergic cells or lateral extension of the GABAergic pars reticulata?) and its role in axial control has not received any support.

The interpretation of the clinical improvement observed in this study should therefore be very cautious. Either the peripeduncular nucleus is in some way involved in gait control and postural stability but this would have to be further documented, or the effect is due to spread of stimulating current up to the PPN and in this case a better result might be expected by direct stimulation of the PPN.

Whatever the physiopathological interpretation which can be given to this study, it is important for reasons of public health care, to inform the potential users of PPN stimulation that this article does not report cases of PPN stimulation but rather PPD stimulation.