Parkinson’s disease and anaesthesia

Editor—We were interested in the excellent review of Parkinson’s disease and anaesthesia in the BJA.1 As the authors noted, one of the challenges in this group of patients can be achieving a comfortable and compliant patient for awake intracranial surgery.

We have recently been involved in providing anaesthesia for awake functional neurosurgery in patients with severe Parkinson’s disease. This surgery involves implantation of bilateral subthalamic nucleus (STN) neuromodulation stimulators. The procedure requires siting of a ‘Leksell’ stereotactic head-frame (Elekta Instruments AB) under local anaesthesia, followed by an MRI scan, the creation of two sequential burrholes, STN stimulation and a final MRI scan. The ‘Leksell’ frame has a close fitting Perspex fiducial box attached to allow accurate targeting of each STN. This arrangement is extremely claustrophobic for most patients especially when the usual MRI head coil is also in place for scanning. The frame renders the airway impossible to access for the duration of the entire procedure (~8 h).

Following the creation of each burrhole, a neuromodulation stimulator is implanted in each STN. The patient must be awake and alert at this point to allow test stimulation and to observe changes in symptoms. Power, tone, fine movements, and speech are all assessed; any sedation given either for the MRI scan or burrhole creation must have completely worn off for this assessment.

We have found that a suitable technique to achieve these goals can be provided with a remifentanil infusion. We prepare the remifentanil as a dilute 10 μg ml⁻¹ solution (500 μg in 50 ml saline) and then, using a ‘Protégé’ 3010 MRI compatible pump (Medex-A Furon, USA), run this at 0.05–0.15 μg kg⁻¹ min⁻¹ during frame placement, MRI scanning and burrhole creation. Before starting the remifentanil infusion the patient is given granisetron 1 mg and up to midazolam 2 mg. Small increments of midazolam have been shown to improve the quality of sedation and reduce the incidence of nausea and vomiting associated with a remifentanil infusion without increasing the incidence of adverse effects.2 This regimen provides profound sedation that rapidly wears off once the infusion is stopped to allow full patient cooperation during STN stimulation. We have had no problems with apnoea, bradycardia, or nausea.

We have not encountered any problems with remifentanil-induced muscle rigidity, as the infusion rates we use are well below the threshold of 1 μg kg⁻¹ min⁻¹ necessary to produce this problem.3 Additionally, we continue L-DOPA therapy during the initial MRI scanning phase of the procedure. We have considered the use of propofol, but are concerned that in addition to unpredictable effects on the disease process,4 residual sedative effects may make patient co-operation difficult.

We would like to recommend this technique for functional surgery in patients with Parkinson’s disease.

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Editor—Thank you for the opportunity to reply to Dr Gray and colleagues’ letter.1 We are delighted that they found the review so helpful. Providing anaesthesia for neuromodulatory procedures is
challenging because of the duration of the procedure, the extremely claustrophobic conditions, the nature of the patient’s illness, and the requirements for patient compliance during the procedure followed by a rapid recovery. There is a paucity of information on how this can ideally be achieved. Propofol would appear to satisfy these requirements, but its unpredictable effects on involuntary movements precludes its use. The regimen suggested by Dr Gray and colleagues would appear to satisfy the above criteria and appears to provide safe and effective sedation. We would be interested to know how many patients they have studied using this regimen and the number, if any, of adverse effects encountered.

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