

## Ablative procedures in Parkinson's disease: a forgotten tool?

*Procedimentos ablativos na doença de Parkinson: uma ferramenta esquecida?*

*Procedimientos ablativos en la enfermedad de Parkinson: ¿una herramienta olvidada?*

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### OPINION

Parkinson's disease (PD) is the second most prevalent neurodegenerative disease and movement disorder, affecting 7-10 million people worldwide<sup>1</sup>. Although rare before the age of 50, its prevalence after 60 can range from 1 to 4% after 60<sup>1-3</sup>. In particular, Parkinson's disease brings a significant duty to the patient and their family<sup>4</sup>. Besides the classic motor symptoms that cause functional incapacity, frequent falls, autonomic issues, and eventually, dementia, contribute to the low quality of life and increased mortality<sup>4</sup>.

Despite its high prevalence, no cure (or short term possibility for that) is still available. However, dopaminergic agonists and deep brain stimulation (DBS) have been the

stand of care in those patients and have already sufficient clinical evidence for their usage<sup>5-9</sup>. However, none of them is capable of changing the natural history of the disease, even though there has been a considerable effort in seeking neuroprotective therapies<sup>10,11</sup>.

Besides, neuromodulation, such as DBS, represents a high cost for public health care not only in developing countries but also in developed ones<sup>12</sup>. Worth mentioning, as the population ages worldwide, the prevalence of Parkinson's disease will continue to increase, representing still higher costs when comparing to the present date. What is more, some patients are not willing to undergo a procedure in which some material is permanently implanted, which will bring some concerns regarding physical exercises, for example. Importantly, how should we manage those patients with a surgical indication for Parkinson's disease and at the same time, has HIV or are immunocompromised? Nevertheless, what to do with patients who have significant comorbidities and are not able to undergo general anesthesia during a DBS surgery?

What to say about those who live far away from the reference center, having difficulty in maintaining the follow-up during the DBS programming? For all those patients, one still has the option of ablative surgeries, such as pallidotomy<sup>12</sup>.

Ablative surgeries were long used in the treatment of movement disorders, mainly in Parkinson's disease<sup>13</sup>. However, what exactly does ablative surgery mean? What

happened with the procedure? Why were they abandoned, especially in developed countries? Have they proved themselves without clinical evidence to be discarded as they have? Can they still be used in the neuromodulation era?

Ablatives surgeries consist of stereotactic-oriented lesions performed by radiofrequency in the globus pallidus or thalamus. They are done in a very accurate manner (error margin within 1 mm)<sup>14</sup>. Still, macro and microstimulation allow the surgeons to recognize the patients' improvements or side effects<sup>14</sup>. For this reason, before a permanent lesion is performed, the surgeon does several tests in order to prevent neurological deficits. In experienced hands, ablative surgeries are relatively safe, with little neurological complications<sup>15,16</sup>.

Nevertheless, if the procedure itself is safe, common sense could say that the surgery could potentially be performed in our days. However, with the advent of DBS in the '90s, all the attention drives to the neuromodulation direction, putting ablative procedures aside. There is no doubt that DBS surgery came to stay and represented a significant breakthrough in Parkinson's disease surgery, and it is more effective than ablative procedures<sup>17</sup>. Nonetheless, not necessarily because one procedure is effective means that the other one (ablative) is not. Remarkably, when one sees researches in Parkinson's disease surgery, the overwhelming majority of them concern neuromodulation, such as DBS surgery. Of course, economic issues also play

a role in this issue, since DBS is more expensive than ablative surgeries<sup>12</sup>.

For this reason, there are no interests from manufacturers and suppliers in investing in inexpensive surgeries such as the ablative ones. Not only that, many patients and neurologists see an ablative procedure as outdated, ineffective, and risky, although one knows that this claiming is not true. In developed countries, where patients can afford DBS surgery, the issue cost sometimes does not matter. So in those countries, ablative surgeries were almost abandoned, occupying only historical records in neurosurgery.

Concerning clinical evidence, pallidotomy is regarded as level 1 of evidence, with 2 RCTs (randomized controlled trials) proving its efficacy<sup>13,18</sup>. Therefore, there is no doubt that this procedure carries improvement in the motor symptoms as well as in the quality of life. This improvement has been witnessed in our group (unpublished data) and others<sup>13,17,18</sup>.

To summarize, one still sees a role for ablative surgeries, mainly pallidotomy in Parkinson's disease treatment, in specific cases. Although the indications for choosing ablative surgery instead of DBS are restricted, one should not undervalue a procedure by which has been used for such a long time, with strong clinical evidence and low cost. There is no reason to left patients untreated only because he or she cannot afford a DBS device. Importantly, many young neurosurgeons are no longer familiarized with

ablative procedures cause they are only trained in DBS surgery. This lack of knowledge is, in our viewpoint, detrimental for their medical formation and patients' choice, since not all the patients will fulfill the prerequisites to have a DBS surgery done. Even though neuromodulation has achieved significant progress in the treatment of Parkinson's disease, there still is room for ablative surgeries. Eventually, the choice for the procedure should be individualized, as all the treatments in neurological disorders should be.

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