Letter: Direct Image Guided Targeting and Its Importance in Deep Brain Stimulation Surgery

To the Editor:

Direct image guided targeting is important in deep brain stimulation (DBS) surgery. The need for dopaminergic medication has decreased by 50%, considerable time could be saved, and good progress has been made thanks to subthalamic nucleus (STN) stimulation. Consequently, dyskinesias have improved.

Our studies have shown that magnetic resonance (MR) targeting is sufficient. Otherwise, for the purpose of placing the electrode in a correct position, microelectrode recording (MER), macrostimulation and magnetic resonance imaging (MRI) or other imaging techniques, and anatomic lead placement are used.

It has been commonly approved that intraoperative stimulation is a method used during surgery. However, there has been a discussion between neurosurgeons using MER and those using other techniques on its advantages and disadvantages with regard to hemorrhagic complications during DBS. The prolongation of the operation time and the awake surgery are some of the other factors. Our experience and thoughts support this.[1,2]

Fast Fourier transform (FFT) can be applied to information collected from MER, which enables us to decrease the number of microelectrodes during surgery. Thus, the vitality of MER in DBS surgery has been questioned.[3]

The potential benefits of image guidance are single-planned surgical targeting, shortening of surgical time, and use of general anesthesia. This approach consumes less time than MER. In addition, it should not be overlooked that intraoperative macrostimulation is important for clinical success. As a result of using the image guidance procedure, less electrode transit is required, which is less traumatic and with less postoperative side effect. Variability in the position of the STN is important. With DBS, direct targeting could be achieved compared with other indirect techniques.[1-3]

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REFERENCES

1. Kaptan H, Ekmekçi H. Long-term results for single electrode-guided deep brain stimulation used to treat Parkinson's disease. *Arch Neuropsychiatry*. 2019;56:1-4.
2. Ashkan K, Blomstedt P, Zrinzo L, et al. Variability of the subthalamic nucleus: the case for direct MRI guided targeting. *Br J Neurosurg*. 2007;21(2):197-200.
3. Kaptan H, Ayaz M, Ekmekçi H. Effect transformation of the micro electrode recording (MER) data to fast Fourier transform (FFT) for the main target nucleus determination for STN-DBS. *Acta Inform Med*. 2014;22(6):411-412.

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