The multi-target deep brain stimulation (DBS) aimed at improving symptoms related to different nuclei is a promising research direction. However, to implant a single lead into multiple targets simultaneously is difficult with the current lead implantation method.

Ding et al. proposed a novel stereotaxic system used for implanting a curved lead to any two targets of the brain, and used the theoretical "curved lead method". First, a customized novel stereotaxic system was fabricated, and a solid cranial model with six fixed internal targets was made; second, CT scan was performed to locate the fixed internal targets; third, five curved leads were implanted to five selected pairs of targets, each following the calculated parameters of "curved lead pathway" with the novel stereotaxic system, respectively. Finally, CT scans were performed again to determine the exact locations of the curved leads.

The five curved leads accurately passed through the five pairs of combined targets, respectively, and the average vector error of curved lead implantation was 0.70±0.24mm. Comparison with Existing Method(s): In most situations, performing a multiple-target DBS procedure with the current stereotaxic systems means increased number of implanted leads, increased incidence of operative complications, and increased medical costs. However, the novel stereotaxic system could guide a single lead to reach two selected targets of the brain with high accuracy.

The novel stereotaxic system enables curved lead implantation with high accuracy, and can be considered as a useful complement to the current stereotaxic system ¹⁾.

1)

Ding CY, Yu LH, Lin YX, Chen F, Wang WX, Lin ZY, Kang DZ. Title: A novel stereotaxic system for implanting a curved lead to two intracranial targets with high accuracy. J Neurosci Methods. 2017 Aug 20. pii: S0165-0270(17)30298-4. doi: 10.1016/j.jneumeth.2017.08.017. [Epub ahead of print] PubMed PMID: 28834693.

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