Subthalamic nucleus volume

The Subthalamic nucleus volume was measured using magnetic resonance images and 3-dimensional volume reconstructions of stereotactic magnetic resonance images. Intraoperative microelectrode recording was performed on all patients and the maximal electrophysiologic length of the STN was recorded for each patient. In the postoperative period, the permanent electrode was modeled and reconstructed in 3D, and the longest distance traveled in the STN was calculated. Sixty-one patients (122 STNs) who underwent surgery between 2012-2022 were included in the study. Thirty-six (59%) of the patients were male, and 25 (41%) were female. We used a total of 166 electrodes. The most common end alignment used was center with 86. STN length averaged 4.9 mm (0-10.5 mm). The mean STN volume was 0.11 cm3. The STN Volume of men was significantly higher than women. The STN Length, Volume, and the target MER length showed a positive correlation significantly.

With radiological advances, it is possible to better visualize the target points and define the boundaries better, and direct methods can be used more in making targeting plans. MER records obtained during surgery and STN dimensions in pre-surgical planning show compatibility, and it is seen that there may be differences between the right and left sides because of brain shifting. Although radiology is increasingly providing better support, electrophysiological recordings provide real-time information on the electrodes\' locations and give the opportunity for the surgical team to choose an alternative target [1)].

1)
Tugcu B, Hasimoglu O, Altinkaya A, Barut O, Hanoglu T. Comparison of Electrophysiological and Radiological Subthalamic Nucleus Length and Volume. Turk Neurosurg. 2022 Sep 7. doi: 10.5137/1019-5149.JTN.42157-22.1. Epub ahead of print. PMID: 36128921.