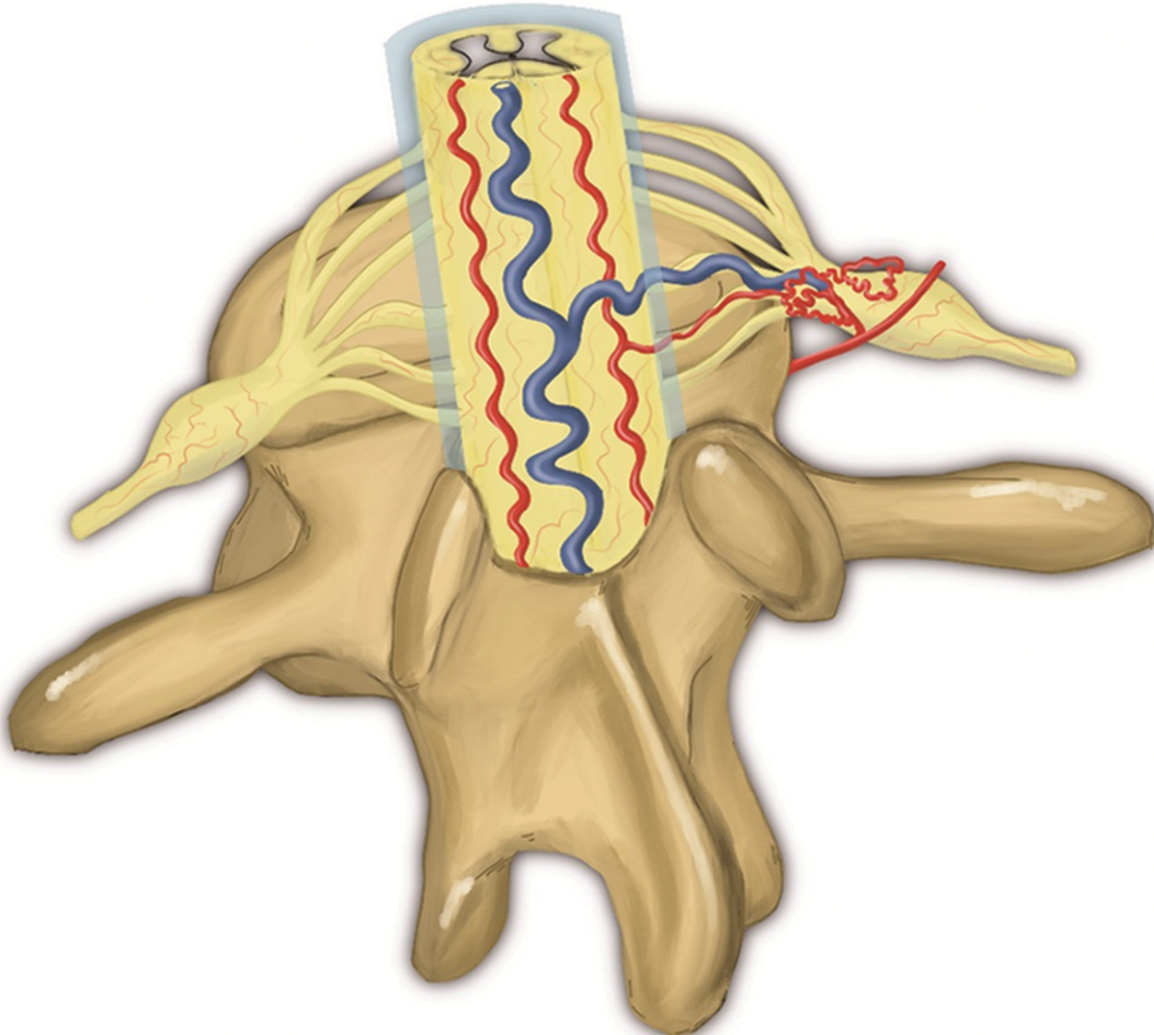


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Globus Pallidus Internus Deep Brain Stimulation for A Patient With Parkinson's Disease and Cerebral Developmental Venous Anomaly in the Region of the Basal Ganglia

Sir,

We would like to present a deep brain stimulation (DBS) surgery case wherein we had to reconsider the target for lead implantation due to a developmental venous anomaly (DVA).

Our 45-year-old male patient was diagnosed with Parkinson's disease ten years prior to surgery. He was selected for subthalamic DBS implantation, and he underwent the standard examination protocol. The preoperative MRI revealed a DVA in the region of the left basal ganglia. As the majority of the vessels were found in the trajectory running toward the subthalamic nucleus, based on the major symptoms of the patient, we decided to place the leads into the internal globus pallidus (GPi) as GPi DBS has long-term efficacy that is comparable with STN DBS.^[1-3]

Trajectories were selected in a way so as to avoid the branches of the DVA. On the left side, only one safe trajectory could be defined for microelectrode recording and final lead placement [Figure 1]; on the right side, we applied the usual 5-channel microelectrode trajectory planning. The implantation of the right side lead was conducted in the usual way using 5-channel microelectrode recording.

After surgery, the patient was observed in the general ward. No neurological deficit occurred. Native thin-slice CT was done postoperatively revealing no surgical adverse event, such as bleeding or lead misplacement. The stimulation started approximately one month after implantation with good results regarding the patient's symptoms. Follow-up MRI showed the electrode passing safely between the branches of the DVA [Figure 2].

In this case, a DVA made surgical planning difficult. DVAs can be present in various locations, including the cerebrum, cerebellum, and brainstem,^[4] and they are quite common accidental findings. The presence of a DVA in the trajectory or target sites of DBS surgeries can jeopardize the feasibility of the planned operation. However, we could find a safe way to place the DBS lead avoiding conflict with the branches of the DVA; in turn, we had to modify our initial plan from STN DBS to GPi DBS. Our case proves that even if in certain cases unexpected or unusual structures might act as a contraindication for DBS surgery, using meticulous planning and precise devices some of these difficulties can be overcome.

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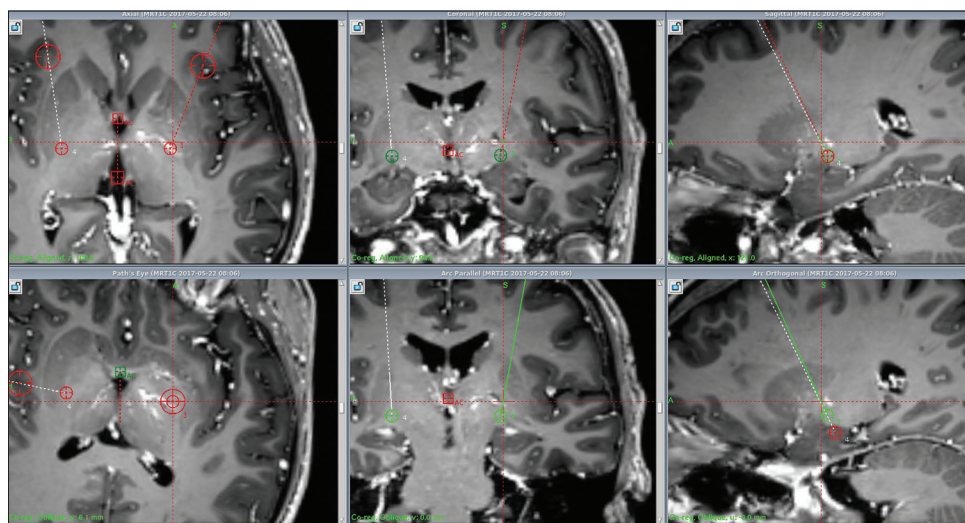


Figure 1: Preoperative planning avoiding the branches of the DVA

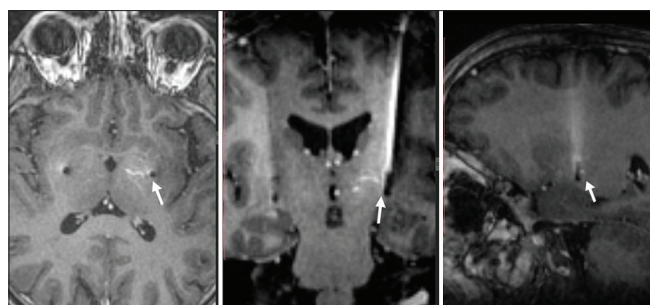


Figure 2: Postoperative MRI revealing the lead position related to the branches of the DVA (white arrows)

Conflicts of interest

There are no conflicts of interest.

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