

A Novel Image Guided System to Mount Micro Targeting Platform for Deep Brain Stimulation Surgery to treat Parkinsons Disease

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USA

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A Novel Image Guided System to Mount Micro Targeting Platform for Deep Brain Stimulation Surgery to treat Parkinsons Disease

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Research Abstract

? DESCRIPTION (provided by applicant): Customized, miniature rapid-prototype stereotactic frames: Micro-Targeting Platform (MTP), for use in deep brain stimulation (DBS) surgery has gain popularity among Parkinson's patients with its smaller and lighter structure, and it has

demonstrated many advantages over traditional heavy and bulky frames through clinical studies, considering that the DBS surgery typically requires patient awake through the procedure to conduct the intraoperative physiological mapping. However, MTP needs a process involved two stages: (1) implanting anchors several days prior to surgery; (2) performing the surgical operation with MTP on the implanted anchors. The two-stage process is a burden for patients and surgeons, and increases the cost of surgery. This proposal presents an innovative method to make this process achievable in a single stage. Taking advantage of the intraoperative imaging and image guided surgery (IGS) technologies, the process mentioned above can be conducted through one stage. Instead of implanting the real anchors on the head of patient in first stage, virtual anchors are positioned in the image volume acquired through diagnose phase. Then the virtual anchor locations are used in designing the MTP, rather than the real anchor locations. During the surgery, the real anchors are implanted through image guided method. In this way, only one hospital visit for patient is needed for surgery, and patient does not need to have the anchors on the head for many days while waiting for the MTP design and fabrication, which will reduce the patient discomfort and inconvenience, as well as the cost of the surgery. Improving care of Parkinson's patients through DBS surgery is the goal of this research. In this Phase I project, a prototype system simulating MTP mounting will be developed and tested through phantom study to verify the feasibility of this method. Whether the proposed workflow is a practical process will be studied. With current available intraoperative imaging and image guided technologies, precisely intraoperative MTP positioning is expected. Further clinical study will be conducted if this project is successful. A stand-alone or integrated system with our current intraoperative CT imaging device — xCAT could be a new product at Xoran Technologies LLC.

Further information available at:

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