DEEP BRAIN STIMULATION FOR TOURETTE SYNDROME: A MINI-CASE SERIES

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INTRODUCTION

Deep brain stimulation (DBS) is an effective therapy for refractory Tourette syndrome[1]. Many targets have been proposed including the thalamus, posterior lateral or anterior medial of the globus pallidus internus, anterior limb of internal capsule. Yet there is no consensus on how the selection of targets could be personalised to the patients' presentation, especially when such patients often suffer from psychiatric comorbidities, such as obsessive-compulsory disorder (OCD). Here we describe the local experience of three cases with Tourette syndrome treated with DBS of bilateral anteromedial nuclei of globus pallidus internus (amGPi). Target-brain connectivity is analysed.

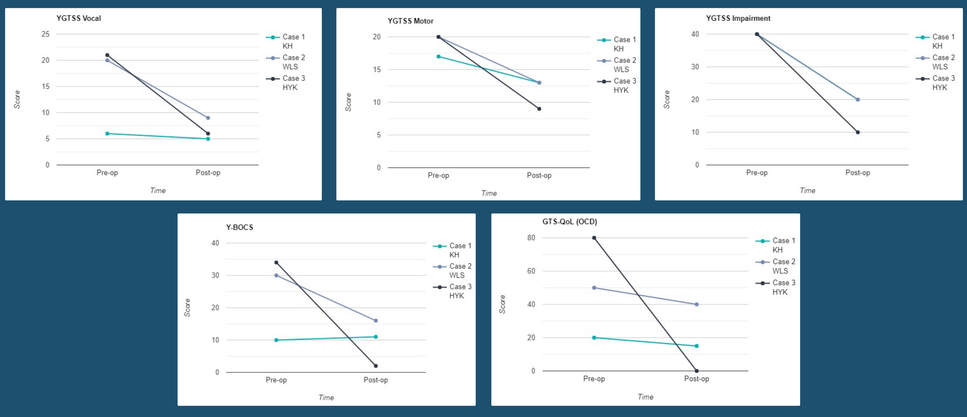
METHODOLOGY

Three patients with Tourette syndrome refractory to medical treatment underwent amGPi DBS from 2018 to 2020. Clinical data were collected prospectively. Clinical outcomes were measured by Yale Global Tic Severity Scale (YGTSS), Yale-Brown Obsessive-Compulsive Scale (Y-BOCS), and Gilles de la Tourette Syndrome Quality of Life (GTS-QoL). The follow-up period was ≥1 year post-operatively. Target-brain connectivity was studied by fiber-tracking using the volume of tissue activated as the seed.

RESULTS

All three cases showed a significant and sustained improvement past 1-year post-op in control of Tourette symptoms. Patient 1 had mild OCD symptoms at baseline while Patients 2 and 3 had more severe symptoms, which improved the most after DBS.

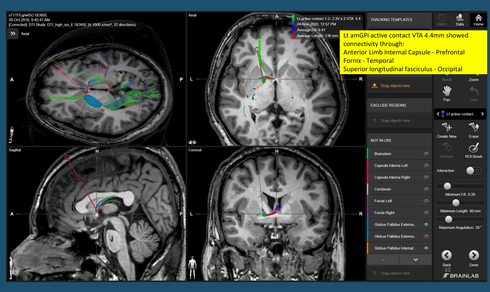
Target-brain connectivity of all three cases showed prominent connectivity to the pre-frontal region via the anterior limb of the internal capsule and to the limbic system via the fornix. The results are consistent with literature that amGPi DBS is effective for Tourette syndrome with comorbid OCD. The intensity of such target-brain connections was more obvious in case 2 and 3 who had significant OCD symptoms.



DISCUSSION

The anterior part of Gpi is a limbic-associative subdivision, with strong pre-frontal connection[2]. am-GPi DBS has been shown effective for Tourette syndrome patients with a predominant comorbidity burden[4]. amGPi has also been reported as an effective DBS target for patients with OCD[3].

Our results are consistent with the literature that amGPi DBS is effective for Tourette syndrome with comorbid OCD. Our study suggests that the intensity of prefrontal and limbic connectivity may correlate with the clinical severity of exhibited symptoms, hence defining the suitable target(s) for DBS. However, more cases studies and a quantitative DTI analysis are needed.



CONCLUSION

In the target selection of DBS for Tourette syndrome with significant comorbid OCD, amGPi might be the choice. Target-brain connectivity study in pre-operative planning may be an useful adjunct for target planning.

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