**Abstract**

**Anterior nucleus of thalamus deep brain stimulation for refractory epilepsy: long term results of a prospective cohort study**

Eric YH Cheung1, KY Lau1, XL Zhu1, Howan Leung2, Eva LW Fung3, Venus YH Tang4, Danny TM Chan1, WS Poon1

1Division of Neurosurgery, Department of Surgery, Prince of Wales Hospital

2Division of Neurology, Department of Medicine and Therapeutics, Prince of Wales Hospital

3Department of Paediatrics, Prince of Wales Hospital

4Department of Clinical Psychology Department, Prince of Wales Hospital

**Background and Objectives**  
The anterior nucleus of thalamus (ANT) has been one of the deep brain stimulation (DBS) targets for refractory epilepsy. The study aims to investigate the seizure outcome among patients with ANT DBS for epilepsy. We report the long term outcome of a prospective cohort study

**Methodology**  
Prospective cohort study of DBS for adult patient with medically refractory epilepsy, who are not suitable for resective epilepsy surgery.

**Results**  
Sixth cases (3 females and 3 males, mean age 31.3) received bilateral ANT DBS in our institute from 2015 to 2018 (one in 2015, two in 2017 and three in 2018 respectively). Frame-based stereotactic surgery was performed with both frontal trans-ventricular approach or parietal approach. The active contacts were selected based on the closest Euclidean distant to the mammillothalamic tract (MTT) and ANT junction. 5 out of 6 cases (83.3%) achieved greater than 50 % seizure reduction compared with pre-operation. Mean percentage of seizure reduction was 59.2% at 3 years after DBS (range from 32.7% to 80%). Overall there was a trend of increased seizure reduction rate from year 1 to year 6 post-operatively.

**Discussion and Conclusion**  
This is the first report of ANT DBS for epilepsy in Hong Kong. Although the case number is small, the results are encouraging. It suggests that ANT DBS for refractory epilepsy is effective. Details of the cases and seizure outcome will be presented. The imaging modality to visualize the ANT, the scenario of choosing different surgical approaches and the programming adjustment will be discussed.