

CURRICULUM VITAE

Jong Hyun Kim, MD, PhD

Address: Department of Neurosurgery, Korea University Guro Hospital
80 Guro-dong, Guro-gu, Seoul, Korea
Tel: 02-2626-3098
Email: jhkimns@gmail.com

EDUCATION

- 2006 PhD. in Neurosurgery, Graduate School, Korea University. Thesis: Possible role of monocarboxylates accumulation in hypoxic synaptic depression which is not mediated by adenosine A1-receptor
- 1996 MD. College of Medicine, Korea University

EMPLOYMENT HISTORY

- 2015-present Professor, College of Medicine, Korea University
- 2013-2014 Visiting scientist, Neurological Surgery, Johns Hopkins Hospital
- 2010-2013 Associate Professor, College of Medicine, Korea University
- 2009-2010 Assistant Professor, College of Medicine, Korea University
- 2008-2009 Clinical Assistant Professor, Department of Neurosurgery, Korea University Guro Hospital
- 2006-2008 Research Fellow, Neurological Surgery, Johns Hopkins University, School of Medicine
- 2006-2006 Visiting scientist, Neurological Surgery, Johns Hopkins Hospital
- 2005-2006 Clinical Assistant Professor, Department of Neurosurgery, Korea University Guro Hospital
- 2004-2005 Clinical Fellow, Department of Neurosurgery, Korea University Guro Hospital
- 2001-2004 Captain as a medical officer, Daegu Military Hospital, Republic of Korea Army
- 1997-2001 Residency, Department of Neurosurgery, Korea University Medical Center
- 1996-1997 Intern, Korea University Medical Center



Recent Advances of Neuroimaging for Movement Disorders: Therapeutic Aspects

Jong Hyun Kim, MD

Department of Neurosurgery, Guro Hospital, Korea University College of Medicine, Seoul, Korea

The 'standard' technique of the deep brain stimulation (DBS) has been following procedures: (1) preoperative calculation of target coordinates using MRI, (2) mapping through intraoperative microelectrode recording and (3) test stimulation of clinical effectiveness and side effects. Thanks to recent advances of neuroimaging, these procedures seem to be modified in near future. Advances in MRI definition from 1.5 Tesla (T) to 3.0 T, and even 7.0 T enabled higher signal-to-noise ratio to define anatomical target structures for DBS. Several groups successfully performed DBS with direct targeting method using 7.0 T MRI. Not only STN and GPi on 7 T MRI but thalamic nuclei could be visualized using susceptibility-weighted-image (SWI) of 7.0 T MRI. There is a concern of geometrical distortions at 7.0 T MRI but Duchin et al. showed those are acceptable in central brain regions where target nuclei are located.

Diffusion tensor imaging (DTI) has been used to demonstrate the proximity of effectively implanted DBS leads to axon fiber tracts which are preferentially activated by electrical stimulation. This technique can be applied to stimulate lenticular fasciculus and dentatorubrothalamic tract for STN and Vim DBS. Other technique using DTI like defining "connectome" of the subcortical target has been tried. Novel techniques of visualizing postoperative electrode location are being developed not only using fusion technique with preoperative MRI and postoperative CT but using individualized 3-D atlas.

However, the result of these studies were from small series and research purposes until now. If the novel techniques are sufficiently studied and consensus are made, current DBS procedure may be largely changed from awake surgery to surgery under general anesthesia without, possibly, the need of microelectrode recordings in the future.

MEMO

