

Neurosurgery

1. Staffs and Students (October, 2010)

Professor:	Kikuo Ohno	
Associate Professor:	Masaru Aoyagi	
Assistant Professors:	Tadashi Nariai,	Taketoshi Maehara
Hospital staffs:	Yoshikazu Yoshino,	Yoji Tanaka,
	Takashi Sugawara,	Yoshihisa Kawano,
	Maki Mukawa,	Yoshiki Obata,
	Hitoshi Kanda,	Juri Kiyokawa,
	Shihori Hayashi,	Kana Sawada.
Secretary:	Mariko Tasumi,	Mayako Tokunaga.
Graduate Students:	Keigo Shigeta,	Tomoaki Okada,
	Yoshiyuki Matsuoka,	Yoshihisa Kawano,
	Toshiya Momose,	Mutsumi Fujii,
	Shin Hirota,	Tomoyuki Kino,
	Takumi Kudoh,	Kotaro Kumagai,
	Chihiro Hosoda,	Mullah Saad Habib-E-Rasul,
	Tomoyuki Nakamura,	Takashi Shigematsu,
	Atsuko Ishibashi,	Ritsu Nishimura

2. Purpose of Education

There are various attracting subjects in the field of clinical or basic research. It is essential to acquire the sufficient knowledge and insight into the pathological conditions as well as normal functions of the central nervous system and spinal cord, which will directly benefit for the improvement of clinical results. Main educational purpose of neurosurgery in the graduate course is to provide students opportunity to acquire the proper technique as well as the broad knowledge, and to nurture the mind of exploration.

In the clinical practice, it is important to attach priority to the patients, considering their background. Also in surgery, it is important to preserve the normal brain functions by employing the cutting edge technique. In the research field, it is essential to introduce and develop the latest knowledge and technology by establishing the reciprocal relationship with the other laboratory institutions.

3. Research Subjects

Brain tumors

1. Analysis of the mechanism of tumor proliferation and infiltration, and its application to treatment
2. Analysis of both proliferative and inhibitory cancer genes in cerebral and spinal tumors
3. Studies of photodynamic therapy, irradiation therapy, agents of chemotherapy, immunotherapy, and inhibition of angiogenesis
4. Development of the multi-modal navigation system integrated with anatomical, hemodynamic, and functional information for brain tumor surgery and evaluate its efficacy.

Vascular diseases in the central nervous system and spinal cord

1. Analysis of pathogenesis of vasospasm after subarachnoid hemorrhage and its application to treatment
2. Studies of circulatory disturbance in ischemic and hemorrhagic diseases, and reversibility of the brain tissue
3. Investigations of pathology of Moyamoya disease and the effects of indirect surgical anastomosis on this entity
4. Solutions of problems in the development of endovascular surgery

Neurotrauma

1. Analysis of cell damage and its reversibility, dynamic simulation in cerebrospinal injury
2. Animal experiments concerning treatment of cerebrospinal injury

Functional neurosurgery

1. Pathological analysis and treatment of temporal lobe epilepsy
2. Analysis of intracellular signal transductions

Others

1. Studies of human cerebral circulation, metabolism, and functions using PET, MRI/S, and MEG

2. Studies of receptors in the central nervous system using PET
3. Experiments of brain diseases using animal model MRI and PET

4. Clinical services

Neurosurgery is a clinical department dealing with various diseases of central nervous system and spinal cord including tumors, vascular diseases, trauma, congenital malformation, functional disorders, and infection.

5. Publications

Original Articles

1. Fujii M, Nakagawa K, Tomita H, Tone O, Tamaki M, Takada Y, Hokari M, Nariai T, Ohno K: Efficacy of the American Heart Association/American Stroke Association guidelines for ultra-early, intentional antihypertensive therapy in intracerebral hemorrhage. *J Clin Neurosci.* 17;1136-1139, 2010 2010 Jun 9.
2. Hosoda C, Nariai T, Ishiwata K, Shii K, Matsushima Y, Ohno K: Correlation between focal brain metabolism and higher brain function in patients with Moyamoya disease. *Int J Stroke* 5: 367-373, 2010
3. Inaji M, Sato K, Momose-Sato Y, Ohno K: Voltage-sensitive dye imaging analysis of functional development of the neonatal rat corticostriatal projection. *Neuroimage* 54: 1831-1839, 2011
4. Ishiwata K, Kimura Y, Oda K, Ishii K, Sakata M, Kawasaki K, Nariai T, Suzuki Y, Ishibashi K, Mishina M, Hashimoto M, Ishikawa M, Toyohara J. Development of PET radiopharmaceuticals and their clinical applications at the Positron Medical Center. *Geriatr Gerontol Int.* 2010 Jul;10 Suppl 1:S180-96.
5. Karakama J, Nakagawa K, Maehara T, Ohno K: Subarachnoid hemorrhage caused by a ruptured anterior spinal artery aneurysm. *Neurol Med Chir* 50: 1015-1059, 2010
6. Ohta Y, Nariai T, Kurumaji A, Hirakawa K, Ohno K. Increased binding of inhibitory neuronal receptors in the hippocampus in kainate-treated rats with spontaneous limbic seizures. *J Clin Neurosci.* 2010 May;17(5):612-6.
7. Tamura K, Aoyagi M, Wakimoto H, Ando N, Nariai T, Yamamoto M, Ohno K: Accumulation of CD133-positive glioma cells after high-dose irradiation by Gamma Knife surgery plus external beam radiation. *J Neurosurg* 2010 Aug; 113(2):310-8.
8. Tanaka Y, Nagaoka T, Nair G, Ohno K, Duong TQ: Arterial spin labeling and dynamic susceptibility contrast CBF MRI in postischemic hyperperfusion, hypercapnia, and after mannitol injection. *J Cereb Blood Flow Metab.* 2010 Dec 22.
9. Wakamatsu H, Utsuki T, Mitaka C, Ohno K: Clinical system engineering of long-term automatic thermal control during brain hypothermia under changing conditions. *Technol Health Care.* 2010 Jan 1;18(3):181-201.
10. Yu I, Inaji M, Maeda J, Okauchi T, Nariai T, Ohno K, Higuchi M, Suhara T: Glial cell-mediated deterioration and repair of the nervous system after traumatic brain injury in a rat model as assessed by positron emission tomography. *J Neurotrauma.* 2010 Aug;27:1463-75
11. Karakama J, Nakagawa K, Maehara T, Ohno K. Subarachnoid hemorrhage caused by a ruptured anterior spinal artery aneurysm. *Neurol Med Chir (Tokyo).* 2010;50(11):1015-9.
12. Sawada K, Maehara T, Inaji M, Toriyama H, Okada T, Nariai T, Aoyagi M, Doi M, Ohno K. Case of ruptured multiple cerebral aneurysms associated with primary aldosteronism. *No Shinkei Geka.* 2010 Apr;38(4):347-51.