

Orthopaedic and spinal surgery

1. Staffs and Students (April, 2009)

Professor	Kenichi SHINOMIYA	
Associate Professor:	Atsushi Okawa,	
Junior Associate Professor	Yoshiaki Wakabayashi,	
Assistant Professor:	Keisuke Ae,	Shigenori Kawabata,
	Tsuyoshi Kato,	Daisuke Koga,
	Shoji Tomizawa	
GCOE super student:	Koji Fujita,	Masato Yuasa
(Development Division of Advanced Orthopaedic Therapeutics)		
Associate Professor:	Shinichi Sotome,	Shu Takeda
Junior Associate Professor:	Mitsuhiro Enomoto,	Yoshinori Aso
Graduate Student	Hiroataka KOYANAGI,	Yuki YAMAUCHI,
	Koji FUJITA,	Tomokazu MASAOKA,
	Kyohei SAKAKI,	Takashi HIRAI,
	Masato YUASA,	Dai Ukegawa,
	Madoka Ukegawa,	Tsuyoshi Yamada,
	Takashi Taniyama,	Yoto Oh,
	Ayako Kimura,	Jo Sei, Xu Ren, Pack, Hyrat, Ma,

2. Activities

As a department of Orthopaedic surgery, we execute medical treatment, research, and education in cooperation with section of Orthopaedic Joint Surgery. Orthopaedics deals with musculoskeletal systems such as bone, cartilage, joint, tendon, and muscle and with nervous systems such as spine and peripheral nerve and treats their various disorders by trauma, degeneration, neoplasm, and systemic disease. Thus our research should be extended wide area of basic and clinical fields. Now our research projects include reconstruction of motor function, clinical application of regenerative medicine, development of biomaterials and artificial joints, and pain control.

(1) Research Subjects

- 1) Development and evaluation of a novel artificial bone – porous hydroxyapatite / collagen composite
- 2) Reconstruction of bone defects using bone marrow stromal cells and artificial bone substitutes
- 3) Reconstruction of bone defects using bone morphogenetic proteins and artificial bone substitutes
- 4) Analysis of the mechanisms of spontaneous resorption of herniated disc and clinical application
- 5) Determination of responsible genes for degenerated intervertebral disc
- 6) Clinical applications of spinal cord evoked potentials
- 7) Development of novel diagnostic method for spinal cord function
- 8) Development of cell therapy to repair injured spinal cord
- 9) Development of gene therapy and artificial nerve to repair injured peripheral nerve
- 10) Development of multidisciplinary therapy for musculoskeletal malignant neoplasm
- 11) Reconstruction of motor function after musculoskeletal tumor resection

(2) Clinical Services

By popularity of sports and aging society, the need for orthopaedic medicine is growing rapidly. We carry out not only treatment of the disease but also repair of functional disability for the improvement of QOL by advancing therapeutic strategy.

In spinal operation, instrumentation, microsurgery and spinal cord monitoring yield safety and secure decompression and fusion, resulting early postoperative ambulation and satisfactory outcome.

Hand and upper limb surgery unit has applied microsurgical technique for atraumatic operation and micro-vascular anastomosis. Today, microsurgery is indispensable for re-implantation, nerve repair and transfer, and vascularized tissue transfer. Arthroscopic surgery in upper limb is also available, and provides less-invasive operation.

In musculoskeletal tumor surgery, limb-salvaging surgery is the first choice based on the concept of safety surgical margin from the systematic evaluation of surgical specimens. And also functional reconstruction of the affected limb after

tumor surgery is exerted by plastic and microsurgery technique and application of regenerative medicine.

Examples of advanced treatments for adult hip diseases are one-stage bilateral total hip arthroplasty, less-invasive technique for adult hip reconstruction, and accelerated rehabilitation after hip arthroplasty.

(3) Education

Lab

Goals/Outline:

Molecular biologically and using physiological procedure we analyze motor of joints, spine, intervertebral disc, spinal cord, peripheral nerve disorders, aging, injury, tumorigenesis mechanism and definite how to treat these disorders. And also we would do tissue reconstruction or develop an artificial tissue.

Available program:

Participation in a research group; Everyday as occasion demands