MIRAI Medtech

Next-Generation Supermicrosurgery Consortium

14th Virtual Conference

The Future of Surgery : Echoes of Flow: A New Technology for Mapping Blood Vessel Architecture through Blood Flow Sound

TUE, May 21, 2024, 18:00-20:00 (JST)

The optoacoustic imaging developed through industry-academia-government collaboration at Kyoto University, spearheaded by Dr. Itaru Tsuge and his colleagues, involves placing the required transplantation sites on a measurement surface filled with water. By capturing the sound of blood flow with 512 acoustic sensors, this technique intricately delineates the network of blood vessels in three dimensions. This three-dimensional vascular image allows for color coding corresponding to depth, enabling precise determination of the selection of blood vessels and skin for transplantation, thus reducing the number of transplantations needed.

Dr. Toushirou Mese will present the current status of lymphedema treatment and the photoacoustic imaging device based on images obtained before and three months after lymphaticovenous bypass surgery, as well as future utilization methods.

In Professor Isao Koshima' s opening lecture, the focus will be on topics such as lymphatic vessel transplantation, ultrasound lymphatic perforator mapping, lymphedema, and objective evaluation using bioimpedance. The latest research findings and clinical applications in these areas will be presented.

Opening speech

The latest insights on super microsurgery

Isao Koshima, MD, PhD

Professor and Center Chief, Department of Plastic and Reconstructive Surgery,
International Center for Lymphedema,
Hiroshima University Hospital

Subcutaneous vascular navigation free skin valve surgery with new technology: combining photoacoustic imaging and medical projection mapping.

Itaru Tsuge, MD, PhD

Senior Lecturer, Plastic and Reconstructive Surgery, Graduate School of Medicine and Faculty of Medicine, Kyoto University

New Technology for Lymphatic Vessel Delineation: Photoacoustic 3D Imaging and Lymphedema Therapy in Practice

Toshiro Mese MD

Department of Plastic and Reconstructive Surgery, International Center for Lymphedema,
Hiroshima University Hospital

■ **Registration and Fees : https://cpk.jp/reg/2**

Participation fees for organizations such as companies and public institutions are as follows: 15,000 yen per person, 28,000 yen for two people, and 40,000 yen for three people.

*Special discount tickets for 6 or 12 sessions are also available.

*Free for healthcare professionals, academia, and students (excluding adult students).

Seminar venue URL: https://cpk.jp/s/2072

Registration

Mirai Medtech | https://ikou-funding.com | info@ikou-funding.com

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Outline

In reconstructive surgeries following mastectomy due to breast cancer or for the repair of defects caused by trauma, procedures have been performed to enhance patients' quality of life by transplanting blood vessels along with soft and pliable skin from areas such as the thigh or abdomen. Until now, determining the suitable donor site for transplantation has relied heavily on the experience and judgment of surgeons, often involving the assessment of the condition of subcutaneous blood vessels and lymphatic vessels using techniques such as ultrasound.

The optoacoustic imaging developed through industry-academia-government collaboration at Kyoto University, spearheaded by Dr. Itaru Tsuge and his colleagues, involves placing the required transplantation sites on a measurement surface filled with water. By capturing the sound of blood flow with 512 acoustic sensors, this technique intricately delineates the network of blood vessels in three dimensions. This three-dimensional vascular image allows for color coding corresponding to depth, enabling precise determination of the selection of blood vessels and skin for transplantation, thus reducing the number of transplantations needed.
During surgery, new technologies such as medical projection mapping, which projects images onto the surgical field, and subcutaneous vascular navigation with free flap surgery have been established. Additionally, the PreFlap algorithm has been developed to convert three-dimensional vascular information into a two-dimensional map. In the rapidly advancing field of technology development, effective utilization of imaging techniques is expanding the possibility of achieving safe and minimally invasive surgeries by supporting microsurgery, leading to faster and less burdensome procedures for patients.

Dr. Toushirou Mese will introduce the utilization of this imaging technology in patients who developed lymphedema after surgery for uterine and ovarian cancer. He will present the current status of lymphedema treatment and the photoacoustic imaging device based on images obtained before and three months after lymphaticovenous bypass surgery, as well as future utilization methods.

In Professor Isao Koshima’ s opening lecture, the focus will be on topics such as lymphatic vessel transplantation, ultrasound lymphatic perforator mapping, lymphedema, and objective evaluation using bioimpedance. The latest research findings and clinical applications in these areas will be presented.

Suppreme mtary Information [Career & Achievements]

Itaru Tsuge, MD, PhD

Senior Lecturer, Plastic and Reconstructive Surgery, Graduate School of Medicine and Faculty of Medicine, Kyoto University

2006 Kyoto University Faculty of Medicine; deceased, 2006 Graduate School of Medicine, Kurashiki Chuo hospital, 2008 Specialized in Formative Surgery, Kurashiki Central Hospital, 2013 Kyoto University Graduate School of Medicine, Department of Formative Surgery Graduate Student, 2017 Assistant Professor, Kyoto University Hospital for Formative Surgery, Kyoto University School of Medicine, 2019 Assistant Professor, Kyoto University Graduate School of Medicine, Department of Formative Surgery, 2024 Kyoto University Graduate School of Medicine, Department of Formative Surgery, Lecturer Now
Degree: Doctor of Medicine (Program)

Councilor:
Councilor of Japan Oncoplastic Breast Surgery Society
Councilor of Japan Society of Cranio-Maxillo-Facial Surgery
Councilor of Japanese Society for Reconstructive Microsurgery
Delegate of Japan Society for Surgical Wound Care
Councilor of Japan Society of Plastic and Reconstructive Surgery

Toshiro Mese MD

Department of Plastic and Reconstructive Surgery, International Center for Lymphedema, Hiroshima University Hospital

2019 Graduated from Tottori University School of Medicine
2019 Fukuyama Municipal Hospital Initial Resident
2021 Medical doctor, International Lymphedema Treatment Center, Hiroshima University Hospital
2022 Plastic Surgery Specialist, Hiroshima University Hospital

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