tissue using a laser at wavelengths of near-infrared region. The voxel size was 0.125 mm.

RESULTS: In the still images, the lymphatic vessels up to the diameter of 0.2 millimeters could be observed three-dimensionally with the blood vessels around them. In the videos, it was observed that lymphatic fluid including ICG was transported by spontaneous contraction of the collecting lymph vessels. The flow was observed intermittently with various intervals. The velocity of the flow was also varied from subject to subject. Lymph flow tended to be faster in the upper limbs than in the lower limbs.

CONCLUSION: In this study, three-dimensional high spatial and temporal resolution PA images were obtained using the PAI-05 system, allowing the visualization of fine lymphatic vasculature and its pumping movement. The system is a promising tool for more precise quantitative assessment of the pumping frequency and the velocity in the collecting lymphatic vessels in lymphedema patients or subclinical subjects.

ACKNOWLEDGEMENT: This work was funded by the ImPACT Program of the Council for Science, Technology and Innovation (Cabinet Office, Government of Japan).

REFERENCES:

1. Zackrisson S, van de Ven SMWY, Gambhir SS. Light In and Sound Out: Emerging Translational Strategies for Photoacoustic Imaging. Cancer Res. 2014;74(4):979–1004.
2. Forbrich A, Heinmiller A, Zemp RJ. Photoacoustic imaging of lymphatic pumping. J. Biomed. Opt. 2017;22(10), 106003. doi: 10.1117/1.JBO.22.10.106003.
3. Toi M, Asao Y, Matsumoto Y, et al. Visualization of tumor-related blood vessels in human breast by photoacoustic imaging system with a hemispherical detector array. Sci Rep. 2017;7(2):41970. doi: 10.1038/srep41970.
4. Matsumoto Y, Asao Y, Yoshikawa A, et al. Label-free photoacoustic imaging of human palmar vessels: a structural morphological analysis. Sci Rep. 2018;8(1):786. doi:10.1038/s41598-018-19161-z.

A Clinical Trial for Three-Dimensional Vascular Mapping of Anterolateral Thigh Flap Distally-Branching Perforator Vessels Based on Photoacoustic Tomography: The Protocol and Preliminary Results

Presenter: Itaru Tsuge, MD
Co-Authors: Susumu Saito, MD, PhD; Shigehiko Suzuki, MD, PhD
Affiliation: Kyoto University, Kyoto

BACKGROUND: Thin free flaps are challenging procedures. In particular, the failure of thin anterolateral thigh (ALT) flaps is reported to be associated with the distal branching pattern of the perforator vessels. In a previous study, we demonstrated the feasibility of using photoacoustic tomography (PAT) to identify ALT perforators and their branching patterns in the subcutaneous layer, especially those in oblique or horizontal orientations. In this paper, we present the protocol and preliminary results of a clinical trial for three-dimensional vascular mapping of the distal ALT perforators using PAT imaging.

METHODS: Patients for whom reconstructive surgery using an ALT flap was planned were recruited. Four days before the operation, the bilateral anterolateral aspects of the mid-thigh were examined by PAT. The perforator orientation, as determined by ultrasound, was marked with red ink. The body surface was marked every 4 cm with purple ink. The acquired data were processed three-dimensionally using a laboratory-made imaging software program. The depth of the visualized perforator vessels and the distal networks were distinguished based on the color gradation. The body surface markings were preserved until the operation day using a film sheet. Two days before the operation, the three-dimensional vascular data were converted into a two-dimensional vascular map using a projective image reconstruction technique. A semi-automated normal vector detection method and curvature approximation were applied to maintain accuracy. The depth was indicated by color gradation on a sterilized transparent sheet. The mapping sheet was attached to the patient’s thigh before the operation. The skin incision was performed with cutting the transparent mapping sheet. The stem portion of the perforator vessels was evaluated at the level of fascia lata.

RESULTS: The first clinical trial involved a 32-year-old male patient with a malignant chest-wall tumor. Each PAT scan took approximately 5 minutes per thigh. The perforator vessels were visualized at the expected points by ultrasonography. A two-dimensional vascular mapping sheet was prepared by drawing the courses of the subcutaneous micro-vessels using projection mapping. Our computing
technique projected the trajectories of the vessels in the subcutaneous layer onto a two-dimensional transparent sheet and showed the depth by color gradation. The stem portion of the perforator vessels, as estimated by PAT, was correlated with the operative findings at the points that penetrated the fascia.

CONCLUSION: The first clinical trial protocol revealed the efficacy of PAT in creating a three-dimensional vascular map of the anterolateral thigh in the clinical setting.

REFERENCES:
1. Tsuge I, Saito S, Sekiguchi H, Yoshikawa A, Matsumoto Y, Toi M, Suzuki S. Photoacoustic tomography shows the branching pattern of anterolateral thigh perforators in vivo. Plast Reconstr Surg. 2018; in press.

FINANCIAL DISCLOSURE STATEMENT: The authors declare no conflicts of interest in association with the present study.

ACKNOWLEDGEMENTS: This work was funded by the ImPACT Program of the Council for Science, Technology and Innovation (Cabinet Office, Government of Japan). Canon invented the photoacoustic imaging system used in this study.

The American Society of Plastic Surgeons Conference Hashtag #PSTM17 Dramatically Increased Global Exposure of Academic Plastic Surgery

Presenter: Dhivya Srinivasa, MD

Co-Authors: Meera Reghunathan, BS; Arminder Kaura, BA; Mark W. Clemens, MD; Olivier Branford, MBBS

Affiliation: University of Michigan, Ann Arbor, MI

INTRODUCTION: Social media is a growing communication platform connecting millions of individuals worldwide. Twitter, one of the largest social media enterprises, is a public and easily accessible forum used by both healthcare professionals and non-healthcare professionals in daily communications regarding plastic surgery. We used Plastic Surgery, The Meeting 2017 (PSTM) as a model to analyze tweet demographics, content, and impressions to understand twitter impact on global exposure of plastic surgery.

METHODS: Twitter data for the hashtag #PSTM17, the official designated conference hashtag, and #biaALCL, a specific sub-topic discussed at the conference, was obtained from the Symplur Signals database. These hashtags were used to identify pertinent tweets, analyze content, frequency per conference day, author demographics, and quantify impressions. The most popular tweets were further qualitatively examined.

RESULTS: Sixty percent of attendees posted tweets during PSTM 2017. During the meeting, there were 5,018 tweets by 1,848 unique participants, creating 90 million total impressions. The most popular trending subtopic with the hashtag #PSTM17 was social media itself. Tweet frequency peaked on Day 2 of the conference. Nine of the ten most impressionable tweets using #PSTM17 were made by healthcare professionals, almost equally by private and academic surgeons. Six of the ten tweets relayed information for scientific promotion, while four were social in content. In using the BIA-ALCL panel as a paradigm for information dissemination during the meeting pertaining to a specific topic, the hashtag #biaALCL was analyzed. This hashtag was tweeted 46 times during the meeting, with 23 tweets specifically pertaining to a BIA-ALCL panel, resulting in 581,000 total impressions. Tweets with links to the new BIA-ALCL guidelines resulted in a 230 percent increase in traffic to the guidelines from the nadir in August.

CONCLUSION: Nearly two thirds of the 3,071 attendees at Plastic Surgery The Meeting 2017, the most heavily attended plastic surgery meeting in the US, tweeted meeting-related content using #PSTM17 during the five day conference. Twitter plays an instrumental role in communicating meeting-related academic content between healthcare professionals. A single tweet has the potential to reach millions of viewers. The most commonly discussed topic was social media, highlighting the increasing recognition of this topic as vital to plastic surgery academia. #biaALCL tweets showcase a particularly consequential use of tweeting, in which a single tweet correlated with more than doubled traffic to the most up-to-date guidelines regarding BIA-ALCL treatment. By recognizing the importance of social media in promoting academic information, healthcare providers can move to control the dialogue and tap into the wealthy platform Twitter provides for knowledge dissemination and opportunities for collaboration.