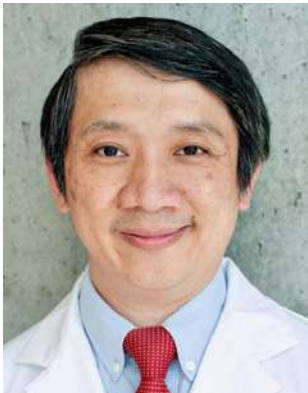# FLASH™ Navigation with 7D Technology

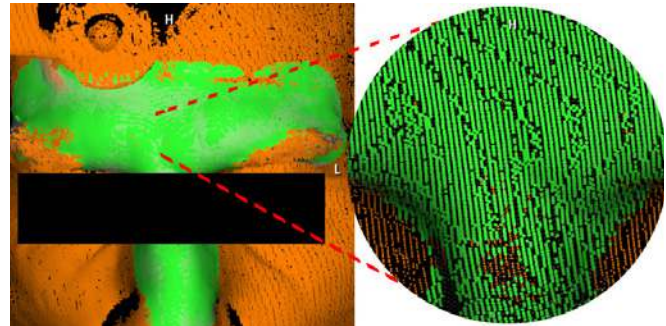**CASE STUDY | Left Temporal Open Biospy**

Surgeon Profile

SURGEON
Victor Yang, MD

LOCATION
Sunnybrook Hospital
Toronto, ON, Canada

Green dots represent registered points between pre-operative MRI and intraoperative digitized patient surface.

Initial Steps

Prior to the procedure, the patient's preoperative CT and MRI were loaded into the FLASH™ Navigation System. The MRI data set was thresholded such that the skin surface was visible, and the CT data set was thresholded to view the skull surface.

MRI Registration

The patient was positioned in the skull clamp in an extreme lateral position for access to the region of interest. The 7D Cranial Reference Frame was rigidly attached to the skull clamp using the Star-Burst Connector. The FLASH Navigation System's Light Head was aimed at the patient's face and the site was instantly digitized using FLASH Registration. Four points were picked virtually on the MRI and on the digitized patient surface without the need to contact the patient, at the user station.
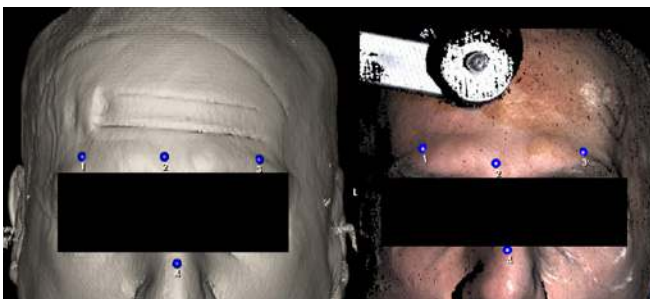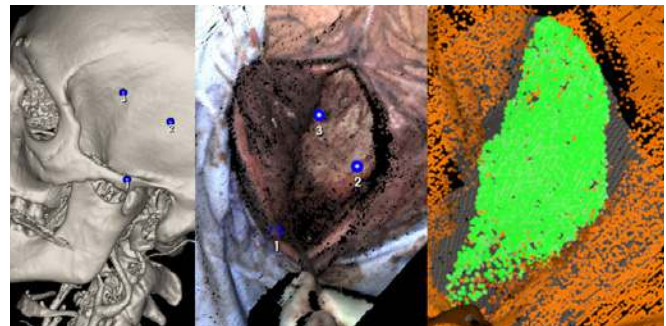

Corresponding points on MRI and intraoperative digitized patient surface.

The FLASH Navigation System then registered thousands of points in under two seconds using the patient's anatomy as a constellation of virtual fiducials, shown below in green. After the patient was draped, Dr. Yang used this registration to plan the appropriate location for the skin flap.

CT Registration

In order to minimize craniotomy size, once Dr. Yang exposed the skull, he chose to perform a second registration by aiming the Light Head to FLASH directly to the bone. Virtual points were picked on the CT and on the intraoperative digitized surface, as shown below in blue. Of the 300,000 points collected instantly using advanced machine vision algorithms, the FLASH Navigation System was able to detect which points to use for registration, shown below in green.

Corresponding points on patient CT (left) and intraoperative digitized patient surface (middle); green points used for registration (right).

Using the FLASH Navigation Cranial Software's Linked Registration feature, the registered CT and MRI data sets were shown overlaid on the FLASH Navigation Surgeon Monitor. Using both registered modalities, Dr. Yang was able to plan the craniotomy location and biopsy approach using the Cranial Pointer.
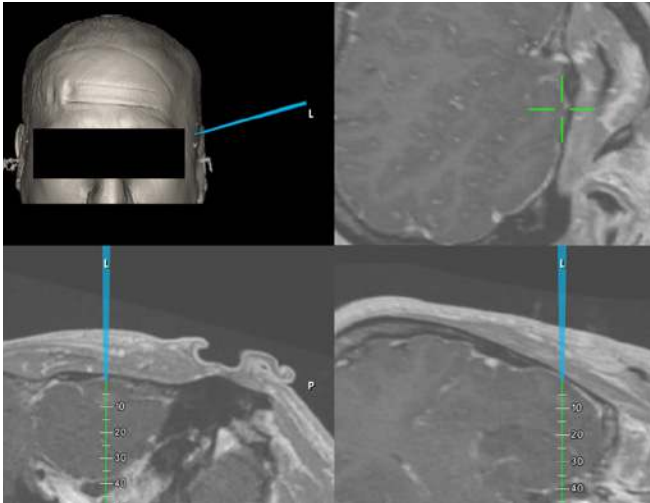
Navigation of 7D Cranial Pointer being used to plan Biopsy trajectory.

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