Intraoperative 3D ultrasound: using IBIS NeuroNav in 28 brain tumor surgeries

Laurence Mercier [1], Rolando F. Del Maestro [2], Kevin Petrecca [2], D. Louis Collins [1]

[1] *McConnell Brain Imaging Centre, Montreal Neurological Institute, McGill University, Montreal, Canada*
[2] *Brain Tumour Research Center, McGill University, Montreal, Canada*

ABSTRACT

Dr Louis Collins' group has developed a prototype neuronavigation system that combines the detailed preoperative anatomical information of MRI with the low cost and real-time advantages of ultrasound. Called IBIS NeuroNav, the system includes a tracked 2D ultrasound probe, which enables acquiring a series of images that can then be reconstructed in 3D. The 3D ultrasound can then be viewed in parallel or superimposed on the preoperative MRI. One unique feature of the system is its ability, when necessary, to automatically correct the ultrasound/MRI misalignment. Aligning the ultrasound with the more familiar MRI helps with its interpretation and is therefore important. The system is currently being tested in the context of brain tumor surgery in collaboration with Dr Del Maestro and Dr Petrecca.

To this date, IBIS NeuroNav has been used in 28 tumor cases. This presentation will go through a few cases to show its advantages and limitations. Ultrasound will also be compared to other intraoperative imaging techniques like fluorescence and intraoperative MRI.