Wu et al., retrospectively evaluated intraoperative data obtained from 16 patients diagnosed with high grade glioma (HGG).

Overall, 18 nodules observed in 15 patients were examined. HGG images from ultrasound and contrast-enhanced ultrasound (CEUS) were compared to those from preoperative reconstructive coplanar enhanced T1-weighted MRI using automatic V Nav fusion image technology.

All HGG tumours were detected. Images of 13 of 18 tumours (72.2%) with obscure margins using B-mode ultrasound were improved with clear tumour boundaries using CEUS imaging. The relative difference in tumour area between CEUS and enhanced MRI modalities in 14 mainly solid component lesions was considered statistically significant (p-value < 0.05). There was a perfect correlation of the enhanced area (EA) between coplanar CEUS and enhanced MRI.

The V Nav fusion image system combining intraoperative real-time ultrasound imaging with reconstructive preoperative coplanar MRI is valuable for image-guided HGG resection. It is suitable for neurosurgeons who lack the expertise in ultrasound technology to discern the brain structure and allows better recognition of tumour and oedema tissues compared with reconstructive preoperative coplanar-enhanced MRI in real-time and in multiplane from different angles. In addition, CEUS combined with B-mode ultrasound could improve tumour detection and resection control in neurosurgery, even in single ultrasound-guided operations [1].

1)
Wu DF, He W, Lin S, Han B, Zee CS. Using Real-Time Fusion Imaging Constructed from Contrast Enhancement Ultrasonography and Magnetic Resonance Imaging for High Grade Glioma in Neurosurgery. World Neurosurg. 2019 Jan 21. pii: S1878-8750(19)30098-1. doi: 10.1016/j.wneu.2018.12.215. [Epub ahead of print] PubMed PMID: 30677585.