During resection of intrinsic brain tumors in eloquent areas, particularly under awake mapping, subcortical stimulation is mandatory to avoid irreversible deficits by damaging white fiber tracts. The current practice is to alternate between subcortical stimulation with an appropriate probe and resection of tumoral tissue with an ultrasound aspiration device. Switching between different devices induces supplementary movement and possible tissue trauma, loss of time, and inaccuracies in the localization of the involved area.

The tip of different ultrasound aspiration devices is currently used for monopolar current transmission (e.g., for vessel coagulation in liver surgery). Colle et al. used the same circuitry for monopolar subcortical stimulation when connected with the usual stimulator devices.

They have applied this method since 2004 in over 500 patients during tumor resection with cortical and subcortical stimulation, mostly with awake language and motor monitoring.

A method is presented using existing stimulation and wiring devices by which simultaneous subcortical stimulation and ultrasonic aspiration are applied with the same tool. The accuracy, safety, and speed of intrinsic intracranial lesion resection can be improved when subcortical stimulation is applied [1)].

1)
Colle H, Colle D, Noens B, Dhaen B, Alessi G, Muller P, Aerts A, Robert E, van der Linden C. Subcortical Stimulation with Tip of Ultrasound Aspirator. J Neurol Surg A Cent Eur Neurosurg. 2021 Aug 25. doi: 10.1055/s-0039-1691824. Epub ahead of print. PMID: 34433223.