Role of intra operative cranial Ultrasonography in detection of residual brain lesions during surgery

A thesis submitted in partial fulfillment

of the requirements for the Msc degree in Neurosurgery.

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2019

Summary

Intracranial lesions are common findings with routine cerebral imaging examination. These lesions often represent a challenge in diagnosis. Intracranial lesions have wide pathologic and imaging spectra, of which some require an aggressive and tailored treatment, whereas many others remain asymptomatic and do not require follow-up or intervention. Intracranial lesions vary in nature solid, cystic, hemorrhagic and that are of multiple nature and they can present at various location in brain compressing its parenchyma and important structures. This leads to affection of brain functional areas causing morbid symptoms up to mortality.

Intraoperative ultrasonography (IOUS) was attempted in the 1960s. Following the introduction of navigation technology in the market, the idea of integrating ultrasonography with neuro-navigation systems was proposed.

Now, IOUS is well established as an intraoperative imaging technique in different neurosurgical procedures.

IOUS is widely used in neurosurgery today. IOUS is very valuable in neurosurgery. It helps in determining lesions location and reducing operative time and hence, provides better surgical efficiency and safety.

In contrast to intra operative MRI, IOUS is less time consuming, simpler and less expensive. It allows monitoring of the progress of the neurosurgical procedures and even of the brain tumour resection during surgery. Thus intra operative intra cranial US is suggested to be a useful imaging technique in

defining the border between the tumour and healthy brain tissue pre-resection and in detecting residual tumour tissue after the resection of the mass. In comparison to intra-operative MR imaging which is not affordable for most hospitals considering the primary cost including non-ferromagnetic tools and the time consuming investigations, ultrasound presents as a practical and cost affordable

In this study, we reviewed the US uses in neurosurgery as a method of neuro-navigation. We discussed the advantage of intraoperative US in detection of residual brain lesions and its help in achieving radical excision and evacuation of brain pathologies.

The most common pathological diagnosis was intracerebral hemorrhage (25%) followed by glioblastoma(15%), the parietal region was the most common site in 8 patients (40%), followed by frontal region in 6 patients (30%).

Post-operative assessment revealed that 5 cases of positive intraoperative US residues and also 11 cases with negative residues confirmed through postoperative CT/MRI and 4 cases (31 %) revealed positive postoperative CT/MRI residues however, negative intraoperative US residue .sounds that IOUS is good sensitive procedure