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LETTER TO THE EDITOR - BRAIN TUMORS

Objective assessment of intraoperative ultrasound in brain tumors

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Dear Editor,

We read with great interest the recent article by Mair et al. "A practical grading system of ultrasonographic visibility for intracerebral lesions" (Acta Neurochir (2013) 155:2293–2298).

We fully endorse their view and cannot agree more with the authors when they say that intraoperative ultrasound (IOUS) is a highly undervalued tool, especially in surgery for brain tumors. However, when the authors say that they present the "first attempt to classify intracerebral lesions on their intraoperative ultrasound appearances" we would beg to differ. Many authors have published on this particular aspect, and we have reviewed the same in our paper earlier [3]. Machi et al. [2], and later Kumar et al. [1] have published some of the earliest attempts at objective assessment of IOUS. Our group also published an objective assessment of IOUS utility not very long ago [3]. In that paper we described a scoring system for lesion identification and delineation which is very similar to the one the authors presently describe. We are indeed surprised that the present paper does not acknowledge these published studies. In our particular paper, we have also highlighted the multipurpose role that the IOUS plays (not just its utility in lesion identification) (Fig. 1). Further, we have described it as a very cost-effective and convenient alternative to other forms of intraoperative image guidance.

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The present study (as acknowledged by the authors themselves) is probably skewed in terms of the tumor types (the predominant group was comprised of metastases, glioblastomas, and meningiomas), with very few low-grade and intermediate-grade gliomas. No wonder they report excellent visualization in their results. These tumors (metastases, meningiomas, hemangioblastomas, cavernomas, and glioblastomas) are generally well defined. Especially for meningiomas, metastases, and cavernomas, lesion localization is what is important during surgical planning; however, resection control is usually not challenging (once the lesion is identified). Where the IOUS really helps and makes a difference is in intra-axial tumors, and that has not been forthcoming in this study because of the skewed histology. Nonetheless it re-emphasizes a valid point that the IOUS is very useful and should be utilized more frequently. Residents and neurosurgical trainees should be exposed to its use early on during their training in order to get comfortable with the image

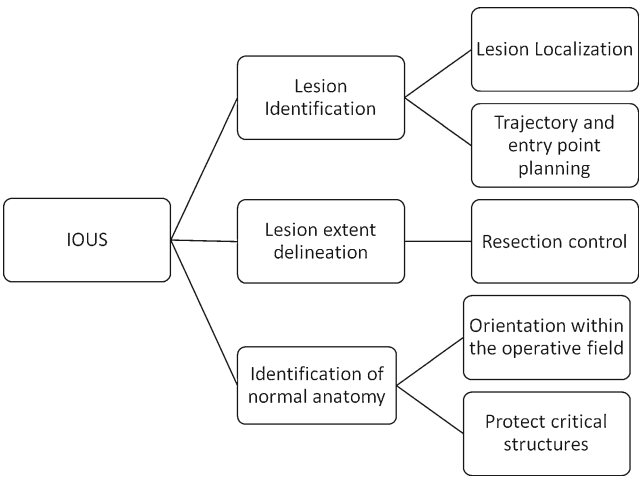

Fig. 1 Flowchart depicting the multiple ways in which intraoperative ultrasound can be useful during tumor resection

interpretation and reduce the steep learning curve. Better scanners with improved visualization have definitely made IOUS more user-friendly. Over the last few years, introduction of navigable three-dimensional ultrasound scanners has significantly improved the outlook for ultrasound guidance during surgery [5, 6]. In our experience, too, navigable ultrasound can improve resection rates in malignant gliomas [4]. A key factor (and what could be a potential limitation) in the successful widespread application and acceptance of IOUS in the operating room is the need for expertise in interpreting the images online. There can be no substitute for experience, and therefore, extensive use of ultrasound can help train the neurosurgeons's eyes and minds to reliably interpret the images, thereby increasing their comfort levels with the tool.

Conflicts of interest None.

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