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Usefulness of Fluorescence-Guided-Surgery In Achieving Gross Total Resection of Malignant Glioma: Evaluation Using Mr Volumetric Study

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Background: Malignant gliomas are highly infiltrative and aggressive primary brain tumors. Achieving gross total resection (GTR) using conventional white light microsurgical technique is a challenge. Five-aminolevulinic acid (5-ALA) can be used as an adjunct for the surgery of adult malignant glioma and improves the rate of gross total resection and patient survival. The use of this method in clinical practice is relatively new in Malaysia. We evaluate the extent of malignant glioma resection under fluorescence-guided resection (FGR) using volumetric MR neuroimaging.

Methodology: A prospective pilot study was carried out in 5 newly diagnosed malignant glioma patients that underwent FGR using 5-ALA. All cases were subjected to both pre and postoperative MR that was performed 72 hours prior to and post surgery. The volumetric assessment was performed using special software program. The Extent of Resection (EOR) was then classified into three categories: Gross total resection (GTR, >90% tumor removal), Subtotal resection (STR, resection of 10-90% of tumor) and Partial resection, <10% tumor removal)

Results: Five patients (mean age 54 years, range 45–60 years), 3 males and 2 females were recruited and analysed. These patients harbored Grade IV glioblastoma. The location of the tumor was predominantly in the frontal lobe (n =3, 60%). The median preoperative tumor volume was 35.67cm^3 (range 19.4-95.79) and the median postoperative tumor volume was 1.47cm^3 (range 0.12-2.37). GTR of >90% was achieved in all 5 patients.

Conclusion: Our experience using Fluorescence-guided surgery enabled a GTR in 100% patients with glioma. We advocate increasing the sample size, which in turn will increase the power of the statistical analysis. The application of 5-ALA has a great potential as a novel standard in neurosurgery in Malaysia to maximize tumor resections for malignant gliomas.

Biography

Marymol Koshy is an Associate Professor of Radiology and Senior Consultant radiologist at the Faculty of Medicine, Universiti Teknologi MARA, Malaysia. As the faculty was a new faculty she spearheaded the planning and designing of the Unit and also the purchasing and Installation of equipments. She also developed the radiology component of the medical students curriculum. In the meantime she subspecialized in cardiovascular imaging in CT and MRI. She has a keen interest in research in most fields of radiology and supervises Masters and PhD students. She is involved in many clinically based researches and has received grant funding.

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