Introduction

Evolving applications of fluorescence technology in neurosurgery

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In this issue of *Neurosurgical Focus*, we will explore the exciting topic of fluorescence-guided surgery (FGS). Neurosurgeons have increasingly relied on FGS for the management of different cerebrovascular and neoplastic lesions. Fluorescence-guided surgery has been established in cerebrovascular neurosurgery with the use of indocyanine green (ICG) angiography. The use of 5-aminolevulinic acid (5-ALA) for fluorescence-guided resection of high-grade gliomas has been widely used around the world for more complete tumor resections. Other tumor types are currently being studied for the use of 5-ALA and FGS. Current regulatory barriers limiting the use of 5-ALA in the US have facilitated the study of other fluorescence-guided technologies for tumor resection. Fluorescein and other fluorophores have demonstrated their own advantages and limitations in the resection of high-grade gliomas. The following collection of papers will provide readers with the most recent information on currently available FGS technologies and the exciting emerging modalities that may advance FGS in neurosurgery.

The leading article in this issue by Butte and colleagues reports on a new technology: near-infrared imaging of brain tumors using Tumor Paint BLZ-100. The accompanying editorial by Dr. Roberts further emphasizes the strengths and limitations of this emerging tool. The second article by Coburger and colleagues describes the correlation between 5-ALA intraoperative fluorescence and Gd-diethylenetriaminepentaacetic acid (Gd-DTPA)-enhanced intraoperative MRI findings for tumor detection at the borders of contrast-enhancing lesions. The subsequent article by Acerbi and colleagues reviews their experience with the use of FGS with fluorescein for resection of high-grade gliomas, and the corresponding editorial by Dr. Berger further elucidates the potential of this fluorophore, which does not carry the regulatory limitations imposed on 5-ALA. In a very different application, Roessler and colleagues review important details regarding intraoperative ICG videoangiography assessment for intracranial aneurysm surgery.

Januszewski and colleagues describe flow-based evaluation for revascularization, while Marbacher and colleagues review a large series of fluorescence-guided resection of primary brain tumors and brain metastases. Millesi and colleagues discuss their experience with resection of spinal tumors. The other subsequent papers further review emerging applications of fluorescence technologies in neurosurgery. We are very pleased with this issue of *Neurosurgical Focus* and believe the readers will find it very informative.

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Disclosure

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