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Advancing Glioma Management: The Pivotal Role of Surgical Neuro-Oncology in Driving Innovation and Translational Research

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Abstract

Purpose of the review: This study aims to assess the evolution of the role of surgery in advancing the treatment paradigm of primary central nervous system malignancies, gliomas.

Recent findings: Diagnostic and therapeutic surgical intervention is the cornerstone for management of all gliomas. Current treatment guidelines for all gliomas include maximal safe resection, with concurrent and adjuvant chemo/radiotherapy, or other targeted molecular therapies, for high-grade gliomas and subsets of low-grade gliomas dependent on mutation profiling and IDH status. The extent of surgical resection affects overall survival across all grades of gliomas. Recently, several technological advances have augmented a surgeon's ability to push the boundaries of extent of resection, while also opening the door for novel intraoperative diagnostic and therapeutic interventions. Increasingly surgery is playing a pivotal role in the management of gliomas from diagnosis to therapeutic intervention, to drug delivery and progression monitoring. Novel technological advances such as advanced image guidance, fluorescence markers, intraoperative functional mapping, histological identification, and intraoperative radiation and drug delivery, provide a fertile ground for combining innovative modalities together to drive better treatment strategies and outcomes for patients.

Keywords: Glioma intraoperative therapy; Surgical clinical trials; Surgical neuro-oncology; Translational research.