TITLE: Evaluation of Cost and Survival in Intracranial Gliomas Using the Value Driven Outcome Database: A Retrospective Cohort Analysis.

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ABSTRACT:

Introduction
Gliomas are the most common primary brain tumors (3–4 patients per 100,000). Treatment options are limited for gliomas, with high costs and low survival rates due to the nature of the disease. We used the Value Driven Outcome (VDO) database to identify cost drivers and subgroups in the surgical treatment of intracranial gliomas.

Methods
A retrospective cohort of glioma patients treated in our institution from August 2011 to February 2018 was evaluated using medical records and the VDO database.

Results
263 patients with intracranial gliomas were identified that met our inclusion criteria (Grade I: 2.0%, II: 18.5%, III: 18.1%, IV: 61.4%). Facility costs were the major cost driver (64.4%) followed by supplies (16.2%), pharmacy (10.1%), imaging (4.5%), and laboratory (4.7%). Univariate analysis of cost contributors demonstrated that American Society of Anesthesiologists physical status (p=0.002), tumor recurrence (p=0.06), Karnofsky Performance Scale (p=0.002), length of stay (LOS) (p=0.0001), and maximal tumor size (p=0.03) contributed significantly to the total costs. However, on multivariate analysis, only LOS (p=0.003) contributed significantly to total costs. More extensive tumor resection in WHO grade III and IV tumors was associated with significant improvement in survival (p=0.004, p=0.02, respectively).

Conclusions
Understanding care costs is challenging in the highly complex, fragmented, and variable healthcare delivery system. We identified facility costs and LOS as significant contributors to total cost of intracranial glioma treatment. Adopting effective strategies that reduce facility costs and limit LOS are likely to reduce total costs in the surgical treatment of intracranial gliomas.

Key words: glioma; glioblastoma; cost analysis; value-driven outcomes; survival; microsurgery; chemotherapy; radiation therapy