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Clinical value of optimizing extent of resection in adult diffuse gliomas

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What do these dates mean?

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Highlights

- Revision surgery in adult-diffuse gliomas, maximizes resection and improves histological accuracy.
- It benefited 90 % of patients analysed (44 % achieved GTR, 46 % revision in histology).
- 81 % of symptomatic patients before revision surgery were at least partially relieved of their symptoms after surgery.
- Major morbidity was 9.8 %, underscoring the safety of the procedure in majority of the patients.

Abstract

Background and Introduction

Revision surgery for adult diffuse gliomas has benefits in terms of maximizing the extent of resection and providing accurate histopathological diagnosis. However, these benefits must be balanced against the potential higher morbidity of redo-surgery.

Methodology

We retrospectively analyzed patients who underwent revision surgery for adult-type diffuse gliomas. Benefits (histological reclassification, and achievement of gross total resection i.e. GTR), and harm (major morbidity) were incorporated into a scoring system, and outcome categories were proposed. For the subset of glioblastomas (IDH wild-type) who underwent GTR, we also calculated the estimated increase in survival, conferred by the relook surgery.

Results

There were 41 patients (M:F ratio of about 3.5), with a mean age of 35.4 years. GTR was achieved in 43.9 % and histopathological discordance seen in 46.3 %. Four (9.8 %) had major morbidity (including one death). Most (37/41) were categorized into the 'definitely benefitted' or 'benefitted' categories. Preoperative symptoms, raised ICP and comorbidities were more likely to predict subtotal resection, with resultant lower benefits from revision surgery. Glioblastomas were also less likely to have GTR, but in the subset that underwent GTR, there was an estimated survival benefit of 4–9 months.

Conclusion

Revision surgery provides valuable benefits in selected patients having undergone an incomplete primary resection, by increasing the extent of resection (and thereby survival) and providing a more accurate histopathological diagnosis due to adequate tumour sampling, provided morbidity can be minimized.

Section snippets

Introduction and background

Extent of Resection (EOR) is a known prognostic factor in diffuse gliomas, and remains the most important (besides adjuvant therapy) modifiable prognostic factor. We have definitive evidence

to support the role of extended resections in both high and low grade gliomas [1], [2], [3], [4], [5], [6], [7], [8]. In certain subsets of lower grade gliomas (for example 1p19q codeleted, Grade 2), radical surgery can also defer the need for adjuvant therapy which can have a significant impact on the …

Study design

This was a retrospective review of prospectively collected data. We identified all adult patients with adult-type diffuse gliomas (as per the as per the WHO 2021 Classification of CNS Tumours) [13] that had been operated and not received any further oncological therapy before being reoperated at our centre (for revision surgery between January 2015 and December 2022, as decided in a joint multidisciplinary neuro-oncology tumor board meeting after verification of histopathology (review of the …

Demographic data, clinical presentation and perioperative features

A total of 41 patients (33 male and 8 female) with a M:F ratio of approximately 4:1 were analysed.

The mean age at presentation for revision surgery was 35.4 years (range – 18–65 years). Twenty (48.8 %) were asymptomatic at presentation. Of those who were symptomatic (21 patients) at presentation, 17 (81 %) were relieved of their symptoms partly or completely, after revision surgery. Table 2 depicts the clinicodemographic and histopathological features of the study cohort. The mean interval …

Discussion

For adult gliomas, the extent of resection (EOR) is an important modifiable prognostic factor, and maximizing the EOR is the surgical goal, provided this does not occur at the cost of neurological function [1], [2], [3], [4], [6]. The prognostic benefit of radical resections seems to be independent of other patient related factors like age [3], [5] and even molecular features [7], [8], [15], [16]. Radical supramaximal resection for GBM, where feasible, is also associated with improved prognosis …

Conclusion

Revision surgery is a viable option for adult diffuse gliomas in select cases. It does not necessarily increase the risk of major morbidity. It must be considered in patients having significant tumour residue, before starting adjuvant treatment. Lower grade gliomas and patients with relatively fewer acute symptoms and better performance scores benefit the most. For glioblastomas, careful case selection to ensure GTR with minimal morbidity is key to obtaining the benefit of a revision surgery. …

Ethics approval

This was a retrospective study and all patients were treated at our centre in accordance with standardized treatment protocols. No deviation from treatment standards occurred. Ethical approval was obtained from the Institutional Ethics Committee of Tata Memorial Centre, Mumbai prior to undertaking the study (IEC no. 4312) with waiver of consent as this was a retrospective study. No personal identifying information of any of the patients has been included in the body of the manuscript or the …

Disclosures

None. No conflicts of interests to disclose …

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CRediT authorship contribution statement

Sahay Ayushi: Data curation, Methodology, Writing – review & editing. **Epari Sridhar:** Data curation, Methodology, Writing – review & editing. **Shetty Prakash:** Data curation, Methodology, Writing – review & editing. **Moiyadi Aliasgar:** Conceptualization, Data curation, Formal analysis, Methodology, Project administration, Resources, Supervision, Writing – original draft, Writing – review & editing. **Singh Vikas:** Data curation, Methodology, Writing – review & editing. **Shroff Krishna:** Data curation, …

Conflict of Interest

The authors declare that they have no known competing financial interests or personal relationships that could have appeared to influence the work reported in this paper. …

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