Title

SURG-15. A NOVEL RISK MODEL TO DEFINE THE RELATIVE BENEFIT OF MAXIMAL EXTENT OF RESECTION WITHIN PROGNOSTIC GROUPS IN NEWLY DIAGNOSED DIFFUSE LOW-GRADE GLIOMA

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subtotal resection (STR) (p=0.006, HR: 0.23, 95% CI: 0.08-0.66), was associated with longer OS. GTR versus NTR (p=0.04, HR: 0.49, 95% CI: 0.29-.85), GTR versus STR (p=0.02, HR: .54, 95% CI: .32-.91) and iMRI use (p=0.02, HR: 0.54, 95% CI: 0.32-0.92) were associated with longer PFS. Frontal (p=0.048, HR: 2.11, 95% CI: 1.01-4.43) and occipital/parietal (p=0.003, HR: 3.59, 95% CI: 1.52-8.49) locations were associated with shorter PFS (versus temporal). Kaplan-Meier analyses showed longer OS with increasing EOR (p=0.03) and 1p/19q gene deletions (p=0.02). PFS improved with increasing EOR (p=0.01), GTR versus NTR (p=0.02), and resections above STR (p=0.04). Factors influencing adjuvant treatment (35.3% of patients) included age (p=0.002, OR: 1.04) and EOR (p=0.037, OR: 0.41 for NTR versus STR; p=0.003, OR: 0.39 for GTR versus STR), but not glioma subtype or location, as determined by logistic regression. Additional tumor resection after iMRI was performed in 105/159 (66%) iMRI cases, yielding GTR in 54.5% of these cases. CONCLUSIONS: EOR significantly improves OS and PFS for patients with grade II astrocytomas and oligodendrogliomas. Intraoperative MRI may improve EOR and was associated with increased PFS.

SURG-13. LASER INTERSTITIAL THERMAL THERAPY FOR RECURRENT GLIOBLASTOMA: A REVIEW OF SURVIVAL OUTCOMES COMPARED TO A MATCHED SURGICAL COHORT

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INTRODUCTION: Glioblastoma (GBM) is uniformly associated with a poor prognosis and inevitable recurrence. Management of recurrent GBM remains unclear, with repeat surgery often employed with varying degrees of success. We evaluated the efficacy of Laser Interstitial Thermal Therapy (LITT) for recurrent GBM when compared to a carefully matched cohort of patients treated with repeat surgical resection. METHODS: A retrospective single-institution database was used to identify patients who underwent LITT or surgical resection of recurrent GBM between 2014-2019. LITT patients were matched with surgical resection patients according to baseline demographics, comorbidities, tumor location, and eloquence. Subgroup analysis matching similar patients for tumor volume was also completed. Overall survival (OS) and progression-free survival (PFS) were the primary endpoints. RESULTS: A LITT cohort of 20 patients was matched to 50 similar patients who underwent repeat surgical resection. Baseline characteristics were similar between both cohorts apart from tumor volume, which was larger in the surgical cohort (17.5 cc vs. 4.7 cc, p< 0.01). On long-term follow-up, there was no difference in OS (HR, 0.72; 95%CI, 0.36-1.45) or PFS (HR, 0.67; 95%CI, 0.29-1.53) between the LITT and surgical cohorts when controlling for tumor volume. Subgroup analysis of 23 LITT patients matched according to tumor volume with 23 surgical patients with similar clinical characteristics also found no difference in OS (HR, 0.66; 95%CI, 0.33-1.30) or PFS (HR, 0.58; 95%CI, 0.90-1.05) between the cohorts. LITT patients had shorter length of stays (1 vs. 4 days, p< 0.001) and a higher rate of home discharge (84% vs. 67%, p=0.172) compared to the surgical cohort. CONCLUSION: After matching for demographic, clinical, and tumor characteristics, there was no difference in outcomes between patients undergoing LITT compared to surgical resection for recurrent GBM. LITT patients had similar survival outcomes yet shorter hospital stays and more favorable dispositions, potentially mitigating post-treatment complications.

SURG-14. AWAKE CRANIOTOMY VS CRANIOTOMY UNDER GENERAL ANESTHESIA FOR GLIOBLASTOMAS: EVALUATING THE IMPACT ON OVERALL SURVIVAL AND RISK OF RECURRENCE

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Maximum safe resection for eloquent glioblastomas (GBMs) is the maximum tumor resection achievable without causing neurological deficits. Although challenging, it must be considered the therapeutic target for GBMs. Indeed, the extension of resection positively correlates with the overall survival and recurrences risk. Awake surgery (AS) has become paramount for achieving maximum safe resection for tumors in eloquent areas. However, there is not a unanimous consensus on the extent of resection of eloquent GBMs, especially for what concerns the so-called supratotal resection (i.e.: resection over the contrast-enhancing limits of the lesion). Recently, several studies focused their attention on the residual tumor volume as estimated from T1-contrast enhanced sequences, but few analyzed the outcomes of patients with a more extended resection. Some authors speculated that increased surgical aggressiveness, thus removing peritumoral edematous area, correlates with improved overall survival and tumor control, without increasing adverse events rates. This study aimed to assess, through quantitative volumetric analysis, the outcomes of a prospectively collected cohort of patients with primary GBM located in eloquent areas. We furtherly subdivided our population into two treatment groups: awake surgery (AS) and general anesthesia (GA) craniotomies. We analyzed the overall outcomes, especially for what concerns MRI T2-Flair signal extent of resection, related to patients' survival and recurrences formation. Eventually, we stratified our analysis by type of treatment (awake surgery vs. general anesthesia) to rule out any significant differences in survival and postoperative GBMs behaviors. Our data confirmed extensive that T2-Flair resection (EOR≥30%) and AS could improve overall survival and reduce risk of recurrence without, at the same time, causing an increase of surgical and medical complications

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BACKGROUND: The overall prognostic significance of maximal surgical resection in patients with diffuse low-grade glioma has been well established. Nonetheless, prior studies omit the combined importance of molecular subclass, patient characteristics, and chemoradiation. Similar to findings recently published in newly diagnosed glioblastoma, incorporation of these interactive factors may redefine the relative benefit of cytoreductive surgery. METHODS: We examine the interactive effects of volumetric extent of resection with molecular and clinical factors to develop a new roadmap for cytoreductive surgery. Based on a 20-year retrospective cohort of 556 patients with WHO II diffuse low-grade glioma treated with surgery at UCSF 444 had complete records for survival modeling and recursive partitioning (RPA) to investigate multivariate relationships of overall and progression free survival. RESULTS: Regardless of molecular subtype, patients with tumor volume under 55cm^3 and postoperative volume of residual under 1.9cm^3 experience the longest OS (median OS: not reached). Patients with volume of residual over 1.9cm^3 experience a OS similar to that of patients with large (over 55cm^3) oligodendrogliomas (median OS: not reached). Patients faring worst have large (over 55cm^3) astrocytic gliomas (median OS: 84.8 months). Patients not treated with chemotherapy and either ATRX wild-type tumors or ATRX-mutant tumors with small (under 1cm^3) volume of residual have the longest PFS together with chemotherapy treated patients who receive either no radiation or radiation for p53-mutant tumors under 30cm^3 (median PFS 119 months). Patients with the shortest PFS are under 32-years with larger volume of residual (>1cm^3), who receive no chemotherapy for ATRX-mutant tumors together with patients who receive both chemoradiation for larger (>30cm3) p53 mutant tumors (median PFS 30.8 months). CONCLUSION: This is the first study to combine extent of resection with molecular and clinical information which paves the way for rethinking surgical strategies for individual patients with newly diagnosed low-grade gliomas.

SURG-16. PREDICTORS OF LOCAL CONTROL FOLLOWING LASER INTERSTITIAL THERMAL THERAPY FOR GLIAL TUMORS

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INTRODUCTION: Laser Interstitial thermal therapy (LITT) is a minimal-access procedure for intracranial tumors that are either refractory to standard treatment paradigms or difficult to access via conventional open surgery. OBJECTIVE: To evaluate predictors of local disease control following LITT in patients with primary and secondary brain tumors. METHODS: Single-center retrospective cohort study of all consecutive LITT ablations between 2014 and 2019. Demographic and procedural characteristics analyzed with respect to local disease control at 6 months. Chi-square tests for categorical variables, T-tests/Wilcoxon Rank-Sum tests for continuous variables for parametric and non-parametric data, respectively. Poisson regression models were used to approximate relative risk (RR) with 95% confidence intervals. RESULTS: A total of 76 patients underwent LITT with a median follow up of 12.3 months; pathology at time of ablation was glioblastoma multiforme (GBM, 36%), WHO grade III primary CNS (24%), low grade CNS (20%), and metastatic lesions (19%) with respective local control rates of 26%, 20%, 29%, and 26%. Pathology of GBM (RR 0.46, 0.21-1.02, p=0.055) and a 5-year increase in age at the time of ablation (RR 0.91, 0.83-0.99, p=0.028) were associated with a lower likelihood