a non-enhancing, ill-defined tumor centered on the left insula and extending into the frontotemporal opercula, corona radiata, and posterior limb of the internal capsule—hypointense by T1-weighted sequence and hyperintense by T2-weighted sequence, thus radiographically consistent with diffuse low-grade glioma. Blood-oxygen-level-dependent functional MRI revealed left hemispheric language dominance in the cortex overlying the tumor, but with no motor cortex involvement. The patient underwent a protocol-driven awake craniotomy, intraoperative positive brain mapping using standard cortical stimulator, transsylvian and transcortical transopercular microsurgical approaches to achieve greater than 80% excision of the tumor. Postoperatively, the patient was seizure-free and with similar neurocognitive status prior to the surgery. The patient had been following up for standard adjuvant chemotherapy and radiotherapy. Avoidance of postsurgical neurologic deficits and maximal cytoreduction can still be achieved by awake craniotomy with brain mapping in settings with limited resources. Despite the lack of other perioperative tools and adjuncts such as diffusion tensor imaging, intraoperative ultrasonography, and even intraoperative MRI that are routinely available in high-resource settings, we illustrate in this case that comparable outcomes could be achieved by overcoming hurdles and aiming for the asymptote to the up-to-date and ideal neurosurgical treatment for diffuse low-grade gliomas.

SURG-09. EXTRAOPERATIVE CORTICAL MAPPING VIA IMPLANTED SUBDURAL AND DEPTH ELECTRODES FOR MAXIMIZING ELOQUENT AREA GLIOMA RESECTION

Konstantinos Fountas, Thanasis Paschalis, and Eftychia Kapsalaki; Faculty of Medicine, University of Thessaly, Larisa, Greece

OBJECTIVE: Aggressive, even supramarginal, resection without compromising the neurological status of the patient remains a great challenge in the management of glioma cases. Accurate cortical and subcortical functional mapping allows more radical glioma resection. Numerous imaging, electrophysiological, and hybrid methodologies have been employed in the cortical mapping of patients with gliomas in eloquent areas. Despite the recent advances of these non-invasive modalities, direct electrical cortical and subcortical stimulation and mapping through an awake craniotomy remains the gold standard for maximal glioma resection and preservation of eloquent cortex functions. Extraoperative stimulation and mapping via implanted subdural and/or depth electrodes may be a valid alternative mapping method in these cases that an awake procedure is not feasible. The role of this mapping method is examined in our current study. MATERIAL & METHODS: In a retrospective study, 51 patients undergoing extraoperative stimulation and mapping for glioma resection were included. The demographic data, the clinical characteristics, the stimulation parameters and complications, the extent of resection, the perioperative complications, and the tumor histological grade were analyzed. Shapiro-Wilk test, as well as uni- and multi-variate regression analysis was used for our statistical analysis. RESULTS: The mean age of our participants was 58 (SD: 9.4) years. The location of the glioma was on the left side in 80.4%, while the frontal lobe was affected in 51.0%. Extraoperative cortical and subcortical stimulation and mapping was successful in 94.1%. The median stimulation procedure was 2.0 hours, while the median implantation time was 72 hours. Stimulation-induced seizures occurred in 13.7%, while CSF leakage in 5.9% of our cases. The mean extent of resection was 91.6%, while transient dysphasia occurred in 21.6%, and transient hemiparesis in 5.9% of our cases. CONCLUSIONS: Extraoperative stimulation and mapping constitutes a valid alternative mapping option in glioma patients, who cannot undergo an awake craniotomy.

SURG-10. PROGNOSTIC IMPORTANCE OF THE EXTENT OF RESECTION IN IDH-WILD TYPE GRADE II ASTROCYTOMAS ACCORDING TO PTERT MUTATION

Alessia Pellerino[1], Francesco Bruno[2], Antonio Silvani[3], Tamara Ius[4], Lorenzo Bello[5], Giuseppe Minniti[6], Andrea Pace[7], Giuseppe Lombardi[8], Riccardo Soffietti[2], and Roberta Rudà[1]; [1]Department of Neuro-Oncology, University of Turin and City of Health and Science Hospital, Turin, Italy, [2]Dept Neuro-Oncology, University and City of Health and Science Hospital, Turin, Italy, [3]Dept Neuro-Oncology, Neurologic Institute Carlo Besta, Milan, Italy, [4]Dept Neurosurgery, University Hospital of Udine, Udine, Italy, [5]Dept Neurosurgery, University of Milan and Clinical Institute Humanitas, Rozzano, Italy, [6]Dept Radiotherapy, University and Sant'Andrea Hospital, Rome, Italy, [7]Neurooncology Unit, IRCCS Regina Elena Cancer Institute, Rome, Italy, [8]Department of Oncology, Medical Oncology 1, IOV-IRCCS, Padua, Italy

BACKGROUND: IDH-wild type diffuse astrocytomas with pTERT mutation have been suggested by cIMPACT-NOW update 3 to share a poor prognosis with glioblastoma (GBM). In a previous series of the Italian Association of Neuro-Oncology, we reported that IDH-wild type grade II astrocytomas benefit from gross total resection. However, the impact of surgery in the pTERT-mutated subgroup has not been addressed so far. Here, we present our preliminary data about the impact of the extent surgery according to pTERT status. MATERIAL AND METHODS: We re-analysed a national database of 122 patients with grade II IDH-wild type astrocytoma. P-TERT mutation was evaluated by gene sequencing. Kaplan-Meier curves were used for the analysis of progression-free and overall survival (PFS and OS). RESULTS: Median follow-up was 33.0 months. P-TERT status was available in 40 cases and the mutation was found in 27 cases (67.5%). Patients with pTERT mutation had a significantly shorter PFS (9.4 vs 147.7 months, P < 0.001) and OS (NR vs 36.6 months, P = 0.012). Furthermore, the OS of patients with pTERT mutation, who underwent gross total resection, was significantly longer than in patients with subtotal / partial resection (37.0 vs 32.0 months, P = 0.018). Thus far, the OS of patients without pTERT mutation was not reached with either subtotal / partial or gross total resection. CONCLUSIONS: IDH-wild type astrocytomas may be stratified into classes with different outcome based on the pTERT mutation. As far as we know, this is the first study that specifically investigated the importance of a gross total resection according to pTERT status in IDH-wild type grade II astrocytomas.

SURG-11. NEOADJUVANT CHEMOTHERAPY FOR DIFFUSE GLIOMAS: A FEASIBLE OPTION?

Aline Campos Paiva[1], João Luiz Vitorino Araujo[2], Guilherme Brasileiro de Aguiar[1], Gabriel Rezende Batistella[3], Marcos Maldaum[4], and José Esteves veiga[1]; [1]Santa Casa de Sao Paulo, Sao Paulo, Brazil, [2]Faculdade de Ciencias Medicas da Santa Casa de Sao Paulo, Sao Paulo, Brazil, [3]Universidade de São Paulo, Sao Paulo, Brazil, [4]Hospital Sirio Libanes, Sao Paulo, Brazil

BACKGROUND: Diffuse gliomas are slow-growing tumors with predilection for deep and eloquent structures such as supplementary motor area and insula. They can reach huge dimensions which is a surgical challenging. OBJECTIVE: Describe indications and limitations of neoadjuvant chemotherapy for diffuse gliomas. METHODS: Systematic review was performed in November/2019 using Pubmed, Bireme and Cochrane databases. The following combinations were used: "Chemotherapy" AND "neoadjuvant" AND "diffuse glioma", "Chemotherapy" AND "neoadjuvant" AND "low grade glioma", "Chemotherapy" AND "preoperative" AND "diffuse glioma", "Neoadjuvant" AND "Chemotherapy" AND "temozolomide" AND "diffuse glioma". RESULTS: After carefully analysis, 7 papers were selected. They had mixed surgical interventions and used different drugs. In general, it was observed that neoadjuvant Temozolomide for Oligodendrogliomas 1p19q codeleted with MGMT methylation had better response than other molecular groups. Tumor reduction was significant. CONCLUSIONS: Quality of life is a main goal in neurooncology. Tumor reduction using chemotherapy is a promising therapeutic. Surgery, especially in eloquent areas, could remove more tumors with less morbidity. Recent publications are using this approach with good outcomes, however further studies with more patients and uniformization are required to stablish this approach.

SURG-12. PREDICTORS OF SURVIVAL AND UTILITY OF INTRAOPERATIVE MRI FOR RESECTION OF GRADE II ASTROCYTOMAS AND OLIGODENDROGLIOMAS: A MULTICENTER ANALYSIS

Alexander Yahanda[1], Bhuvic Patel[1], Amar Shah[1], Daniel Cahill[2], Garnette Sutherland[3], John Honeycutt[4], Randy Jensen[5], Keith Rich[1], Joshua Dowling[1], David Limbrick[1], Ralph Dacey[1], Albert Kim[1], Eric Leuthardt[1], Gavin Dunn[1], Gregory Zipfel[1], Jeffrey Leonard[6], Matthew Smyth[1], Mitesh Shah[7], Steven Abram[8], John Evans[1], and Michael Chicoine[1]; [1]Washington University School of Medicine, St. Louis, MO, USA, [2]Department of Neurosurgery, Translational Neuro-Oncology Laboratory, Massachusetts General Hospital, Harvard Medical School, Boston, MA, USA, [3]University of Calgary, Calgary, AB, Canada, [4]Cook Children's Medical Center, Fort Worth, TX, USA, [5]University of Utah School of Medicine, Salt Lake City, UT, USA, [6]Ohio State University College of Medicine, Columbus, OH, USA, [7]Goodman Campbell Brain and Spine, Indianapolis, IN, USA, [8]St. Thomas Hospital, Nashville, TN, USA

BACKGROUND: Few studies use large, multi-institutional patient cohorts to examine the role of intraoperative MRI (iMRI) in the resection of grade II gliomas. We assessed the impact of iMRI and other factors on overall survival (OS) and progression-free survival (PFS) for newly-diagnosed grade II astrocytomas and oligodendrogliomas. METHODS: Retrospective analyses of a multicenter database assessed the impact of patient-, treatment-, and tumor-related factors on OS/PFS. RESULTS: 232 resections (112 astrocytomas, 120 oligodendrogliomas; 135 males; mean age 36.2 ± 0.9 years) were analyzed. Oligodendrogliomas had longer OS (p< 0.001) and PFS (p=0.009) than astrocytomas. Multivariate regression showed that extent of resection (EOR), including gross-total (GTR) versus near-total (NTR) resection (p=0.02, HR: 0.64, 95% CI: 0.25-.79) and GTR versus

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

Hassan Fadel[1], Sameah Haider[1], Jacob Pawloski[1], Hesham Zakaria[1], Farhan Chaudhry[2], Seamus Bartlett[3], Michael Bazydlo[1], Steven Kalkanis[1], and Ian Lee[1]; [1]Henry Ford Health System, Detroit, MI, USA, [2]Wayne State University School of Medicine, Detroit, MI, USA, [3]Wayne State University School of Medicine, Midland, MI, USA

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

Mario Moro; AZ ULSS 2 Marca Trevigiana, Treviso, Italy

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

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

Shawn Hervey-Jumper[1], Annette Molinaro[2], Joanna Phillips[1], Ramin Morshed[1], Jacob Young[1], Yalan Zhang[1], Marisa LaFontaine[1], Tracy Luks[1], Simon Ammanuel[1], Sofia Kakaizada[1], Javier Villanueva-Meyer[1], Anny Shai[1], Gayathri Warrier[2], Terri Rice[2], Yi Lin[1], Jason Crane[1], Margaret Wrensch[2], John Wiencke[2], Nancy Ann Oberheim Bush[1], Jennie Taylor[2], Nicholas Butowski[1], Jennifer Clarke[2], Susan Chang[1], Edward Chang[1], Manish Aghi[1], Philip Theodosopoulos[1], and Mitchel Berger[1]; [1]University of California San Francisco, San Francisco, CA, USA, [2]Department of Neurological Surgery, University of California (UCSF), San Francisco, San Francisco, CA, USA

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

Sameah Haider[1], Jacob Pawloski[1], Hassan Fadel[1], Hesham Zakaria[1], Farhan Chaudhry[2], Seamus Bartlett[3], Michael Bazydlo[1], Steven Kalkanis[1], and Ian Lee[1]; [1]Henry Ford Health System, Detroit, MI, USA, [2]Wayne State Medical School, Detroit, MI, USA, [3]Wayne State University School of Medicine, Midland, MI, USA

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