This study sought to identify major predictors of survival after second surgery. Methods: We collected clinical, pathological and radiographic data through a retrospective review of charts of 21 patients who underwent elective surgery for GBM recurrence at our institution in the past 6 years. Kaplan-Meier survival analysis and Cox proportional-hazards regression were employed to determine which variables significantly impacted survival time. Results Among variables examined, age, less than or equal to 50 (P equals 0.04), and chemotherapy treatment after second surgery (P equals 0.00057), were significant. Patients younger than 50, had a mean length of survival period of 14.7 months, while patients, age 50 or older, survived an average of 7.6 months. Patients who underwent chemotherapy after second resection survived an average of 12.6 months. Comparatively, mean survival period of patients who did not undergo chemotherapy was 3.7 months. The cumulative prognostic significance of age and post-reoperative chemotherapy treatment was determined to be 0.038 using Cox proportional-hazards regression modelling. Conclusion: The results confirm that younger patients survive longer after second surgery and that a second round of chemotherapy can prolong survival. Data from larger cohorts of patients is required to identify other important predictors.

C7 – Session5 1300-1315

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NovoTTF-100A alternating electric fields therapy for recurrent glioblastoma: An analysis of patient registry data

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Background: The NovoTTF-100A is a first-of-a-kind anticancer device, approved by the Food and Drug Administration in 2011, for the treatment of recurrent glioblastomas. It emits alternating electric fields, at an intensity of 1 V/cm and a frequency of 200 kHz, that mimic the cytotoxic effect of chemotherapy by disrupting charged cytoplasmic proteins involved in the tightly orchestrated process of mitosis. Past phase III trial demonstrated equivalent efficacy when the device was compared to conventional cytotoxic chemotherapies and bevacizumab, but without their systemic side effects. Methods: The NovoTTF-100A device has been available by prescription at 91 oncology centers in the United States since November 2011. We retrospectively analyzed the outcome and toxicity data from patients who were prescribed the device from October 2011 to November 2013 as treatment for their recurrent glioblastomas. Results: There were 147 female and 310 male patients (n=457) who were treated with this device. The median age was 55 (range 18 to 86) years. The Kaplan-Meier median OS was 9.6 (95% confidence interval [CI] 8.0 to 13.7) months and the median treatment duration was 4.1 (95% CI 3.5 to 4.8) months. The most common device-related adverse events include skin reaction (24.3%), neurological disorders (10.4%), heat sensation (8.9%), electric sensation (7.7%) and headache (5.7%). Conclusion: Treatment with NovoTTF-100A, as prescribed in the general clinical setting to patients with recurrent glioblastomas, offers favorable outcomes compared to historical patient data. The adverse event profile of the device remains benign with no new unexpected toxicities.

C8 – Session5 1315-1330

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A longitudinal prospective study investigating cognitive function in patients with high grade glioma

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Forty-one high grade glioma patients were enrolled in this prospective study prior to initial treatment with radiotherapy, chemotherapy or combination therapy. The study participants were assessed prior to treatment and subsequently every 2, 6, 9 and 12 months using self reports of quality of life (FACT-Br) and functional assessment (British Columbia Activity Checklist). In addition, a cognitive assessment (the Montreal Cognitive Assessment - MoCA) and semi-structured interview were performed at baseline and 6 months later. Only 16 patients remained progression free 12 months following treatment; 23 patients died or deteriorated clinically and 2 were lost to follow up. Over half (54%) of patients scored less than 26 on the MoCA at baseline, indicating cognitive impairment before treatment. MoCA scores did not change significantly over time. Similarly, quality of life and functional assessments as reported by patients did not alter significantly over time. Interviews reveal details of the effects of cognitive impairment on patients daily lives. Implications of these findings will be discussed.

C9 – Session5 1330-1345

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Glioblastoma pattern of practice from two regional cancer centres in Canada

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Background: Despite an evidence-base for glioblastoma management, treatment can vary and the pattern of practice in

Canada is unknown. We compared cohorts between 2 regional Canadian Cancer Centres for differences in patient factors, treatments, and outcomes. Methods Cohorts were constructed by a hybrid of retrospective chart review and prospective data collection consisting of all consecutive cases eligible for standard treatment. Demographics, pathology, treatment, and outcome data were obtained. Results The two cohorts (Winnipeg n=80 and Calgary n=103) were similar in terms of median age (57 and 56), percent male (62.5% and 63.1%), percent with good performance status (93.8% vs 85.4%) and extent of resection (gross total/sub-total/biopsy: 17.5%/66.3%/16.3% in Winnipeg and 7.8%/ 68.9%/23.3% in Calgary). Of patients with known MGMT promoter methylation status 28% were methylated in Winnipeg and 58% were methylated in Calgary. Greater than 6 cycles of chemotherapy was given to 42.5% of patients in Winnipeg and 28.1% in Calgary. The most common second line therapies differed: carboplatin and tamoxifen (31.3%) in Winnipeg; low dose temozolomide (26.2%) in Calgary. Significant poor prognostic factors for survival in the combined cohort included age (HR 1.02), extent of resection (sub-total HR 1.7; biopsy HR 8.9) and location (Calgary HR 1.17). Conclusion Comparison of cohorts from different parts of Canada can provide interesting descriptions of patterns of practice. These patterns may be useful in determining opportunities for quality improvement and clinical trial development.

C10 – Session5 1345-1400

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Glioblastoma multiforme in elderly and non-elderly patients in Newfoundland and Labrador: A province-wide six-year analysis.

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Glioblastoma multiforme (GBM) is a devastating and generally incurable malignancy, with increasing incidence in elderly patients. Although advances in adjuvant chemoradiotherapy have shown promise in improving survival, the benefit of these therapies in elderly patients remains unclear. In this population-based retrospective study, we compared treatment patterns and outcomes in elderly (defined as age 65 or older) and non-elderly patients diagnosed with GBM in Newfoundland and Labrador. During 2006-2012, one-hundred-and-thirty-eight patients received a pathological diagnosis of GBM. Median age at diagnosis was 62.5 years (range 20-85) and 56(40.5%) were age 65 or older. Elderly patients were more likely to present with a performance status of ECOG 3 or greater ($p < 0.01$) and to undergo stereotactic biopsy rather than surgical resection ($p = 0.04$), and less likely to receive adjuvant temozolamide chemotherapy ($p < 0.001$). Presence of gross neurological defects and treatment with radiation therapy did not differ between elderly and non-elderly patients. Median survival was 245(CI[95%] 165-269] days for elderly patients versus 342(CI[95%] 274-440] days for non-elderly patients ($p < 0.01$). In Cox multivariate analysis, chemotherapy was associated with improved survival in elderly patients after adjusting for functional status and extent of resection ($p < 0.001$) and was the strongest predictor of overall survival across patients in both age groups ($p < 0.001$). Despite receiving less aggressive surgery and chemotherapy, elderly patients showed evidence of improved survival with adjuvant temozolamide. These data support the growing body of evidence that adjuvant chemoradiotherapy may be beneficial in selected elderly patients with GBM.

SCIENTIFIC POSTER VIEWING

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SP1

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RXFP1 promotes temozolomide (TMZ) chemoresistance in brain cancer

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Current treatments for Glioblastoma (GB), the most aggressive form of primary brain cancer, include surgery, radiation and chemotherapy. TMZ is the most commonly used alkylating agent for GB treatment, but chemoresistance to TMZ is frequently an unsatisfactory treatment outcome. Relaxin Family Peptide Receptor 1 (RXFP1) mediates RLN2-induced cell migration and tissue invasion in many cancer entities including brain cancer. We have discovered RXFP1 expression in GB cells and tissues, but not in normal astrocytes. Down-regulation of RXFP1 in primary GB cells suppressed cell survival, cell invasiveness and induced cell death via a caspase3/7 mediated apoptosis pathway. Importantly, RXFP1- activation enhanced cell survival in primary GB cells treated with TMZ. To elucidate the mechanisms of RXFP1-mediated chemoresistance in GB cells, we identified the RXFP1-mediated up-regulation of anti-apoptotic proteins. In addition, several DNA repair proteins and Base Excision Repair (BER) members were regulated upon RXFP1 activation. Our results suggest that RXFP1 promotes TMZ chemoresistance by enhancing BER function and by suppressing apoptosis, thus, protecting primary GB cells from TMZ-induced DNA damage.

SP2

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Chloroquine inhibits the malignant phenotype of glioblastoma in vitro

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