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The prognostic role of pre-operative complete blood count (CBC) in progression-free survival in patients with meningioma

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Factors which might influence outcome in patients with meningioma are not well-understood. Previous studies have examined associations of laboratory blood values including hemoglobin levels with patient outcomes in cancer. We hypothesized those changes in CBC before tumor resection can be used as one of the prognostic factors for tumor recurrence/progression in meningioma. To address this, we gathered the clinical and pre-operative CBC results for final analysis from 226 patients (64 males and 162 females) who underwent craniotomy for primary meningioma (grades: 157 WHO GI, 59 GII, 10 GIII) at our institution between 2001 and 2015. Individual parameters were analyzed for correlation with progression-free survival. The median recurrence free survival (RFS) was not reached and follow-up ranged 0.3-14 years. Fifty-six patients (25%) had anemia and 30% of the patients showed leukocytosis using standard cut-offs. On univariate analyses, low hemoglobin (Hb) level, as well as high leukocytes (Lkc), neutrophil (Neutro) and monocyte counts correlated with worse RFS. As expected, tumor grade was correlated with RFS. Low Hb level, high Lkc and Neutro counts were all significantly associated with RFS after adjusting for grade. Strikingly, 32% of patients with pre-operative anemia experienced a recurrence at 5 years, compared with only 11% of non-anemic patients. Conclusion: In this exploratory study, we find that pre-operative CBC data, which is readily available, may contain prognostic information relevant to subsequent risk of recurrence or progression in meningioma. While the biological mechanism for these associations is not clear, they represent hypotheses for further investigation.

POSTER VIEWING SESSIONS

**SCIENTIFIC POSTER SESSION 1
 10 JUNE 2016 ~ 1520-1610**

BRAIN METASTASES

PS1 -131

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Dosimetric Feasibility of the Hybrid Magnetic Resonance Imaging (MRI)-LINAC System for Brain Metastases

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We aimed to investigate the feasibility of delivering stereotactic radiosurgery (SRS) or hypofractionated stereotactic radiotherapy with the hybrid MRI-LINAC (MRL) system for patients with

single brain metastases, and to characterize the dosimetric impact at tissue-air interfaces resulting from the electron return effect (ERE). Material/Methods: 24 patients treated for intact single brain metastases were selected for analysis. Three optimized radiotherapy plans with the same prescribed dose were generated for each case: 1) standard noncoplanar volumetric modulated arc therapy (VMAT), 2) coplanar step-and-shoot intensity modulated radiotherapy (IMRT) on the MRL in the absence (MRL_B=0), and 3) in the presence of the transverse magnetic field (MRL_B=1.5). The plans were evaluated using cumulative dose-volume histograms (DVHs) and by calculation of Paddick conformity index (PCI), V100%, V12Gy minus gross tumor volume (V12Gy – GTV), and V2Gy. The dosimetric impact of ERE to the skin and air cavities was quantified using a 5 mm rim of tissue around tissue-air boundaries. Results: All plans met the objectives with respect to target coverage and OAR constraints. Differences between all investigated dosimetric parameters significantly favored the VMAT plans as compared to the MRL_B=0 and MRL_B=1.5 plans, except for V2Gy. The VMAT plans showed a higher mean (\pm standard deviation) PCI compared to the MRL_B=0 and MRL_B=1.5 plans (0.85 ± 0.08 vs. 0.79 ± 0.09 vs. 0.78 ± 0.11). In the presence of the magnetic field, ERE resulted in a statistically significant but small increase in mean dose and D2cc in the skin (0.08 Gy, $p < 0.0001$ and 0.66 Gy, $p < 0.0001$, respectively) and around air cavities (0.07 Gy, $p = 0.0092$ and 0.25 Gy, $p = 0.0004$, respectively). Conclusions: Stereotactic radiation to single brain metastases is feasible using the MRL Monaco treatment planning system; however, in its current iteration, application to small targets deserve careful consideration given the technical limitations resulting in less favorable plan quality compared to that of a noncoplanar standard VMAT technique. The dosimetric impact of ERE at tissue-air boundaries is minor and does not compromise target conformity or dose gradient.

PS1 – 140

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The Effect of Timing of Stereotactic Radiosurgery Treatment of Melanoma Brain Metastases Treated with Ipilimumab

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Melanoma represents the third most common cause of CNS metastases. Immunotherapy has evolved as a treatment option for patients with stage-IV melanoma. Stereotactic radiosurgery (SRS) also elicits an immune response within the brain and may interact with immunotherapy. We report a cohort of patients treated for brain metastasis with immunotherapy and evaluate the effect of SRS timing on the intracranial response. Methods: All consecutively treated melanoma patients receiving Ipilimumab and SRS for their brain metastasis were included in the retrospective analysis. 46 patients harboring 232 brain metastases were reviewed. The median clinical follow-up was 7.9 months (3-42.6). Median age was 63 years (24.3-83.6). 32 patients received SRS before or during ipilimumab cycles (Group-A) whereas 14 patients received SRS after the ipilimumab treatment (Group-B).

Radiographic and clinical responses were assessed at approximately 3 months intervals after SRS. Results: The two cohorts were comparable in pertinent pre-treatment aspects with the exception of SRS timing relative to ipilimumab. Local recurrence free duration (LRF) was significantly longer in Group-A patients (19.6 months, range 1.1-34.7 months) as compared to group-B patients (3 months, range 0.4-20.4 months), respectively ($p=0.002$). Post-SRS perilesional edema was more significant in Group-A. Conclusions: The effect of SRS and ipilimumab in attaining LRF seems greater when SRS is performed before or during ipilimumab treatments. The timing of immunotherapy and SRS may effect LRF and post-radiosurgical edema. The interactions between immunotherapy and SRS warrant further investigation so as to optimize the therapeutic benefits and mitigate the risks associated with multimodality, targeted therapy.

PS1 – 159

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A Case of Intracranial Metastases from Renal Pelvic Carcinoma and Review of LiteratureA. Ghare¹, F. Haji, M. Boulton¹Western University, London, ON aisha.ghare@lhsc.on.ca

Transitional cell carcinoma (TCC) of the renal pelvis is a rare urological malignancy, with only a handful of cases of metastases to the brain reported in literature. We aim to present a case of intracranial metastasis in a female patient with history of renal pelvic carcinoma, and review existing literature of brain metastases from renal pelvic TCC. Methods: We searched PubMed, EMBASE, and MEDLINE from 1966 to January 2016 for published case reports written in English. Results: Five published case reports describe intracranial metastases from renal pelvic TCC. Our case is a 56-year-old woman with known high grade renal pelvic carcinoma and pulmonary metastases, who presented nine years after her initial diagnosis with mild left side weakness and headaches. She was found to have two lesions in the right cerebral hemisphere and underwent surgical resection of the larger right frontal lobe mass. Her neurologic symptoms improved postoperatively. She declined whole brain radiotherapy and remains stable at 6 months' follow-up. This is the first published case of presentation of brain metastases from pelvic TCC more than 12 months after diagnosis of the primary cancer. Conclusion: There is minimal literature of renal pelvic TCC metastasizing to the brain. However, as systemic chemotherapy leads to improved survival from the primary cancer, it is possible for more cases to appear, necessitating increased awareness from the healthcare team.

PS1 – 177

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Diagnosing and Treating Leptomeningeal Metastasis across Europe: A Web-Based SurveyE. Le Rhun¹, M. Weller, R. Soffiotti, R. Rudà¹University Hospital Lille, Lille, Franceemilie.lerhun@chru-lille.fr

Leptomeningeal metastasis is a serious complication of systemic cancer commonly occurring in later disease stages which affects

approximately 10% of patients with solid tumors. The risk is highest for patients with lung cancer, melanoma and breast cancer. Survival at one year is in the range of 10%. Cerebrospinal fluid analysis and magnetic resonance imaging are the most important diagnostic measures. Treatment recommendations vary by primary tumor and pattern of disease, that is, e.g., the absence or presence of concurrent systemic or solid brain metastasis. To explore the current practice of diagnosing and treating leptomeningeal metastasis across Europe, a web-based survey was sent to members of the European Association of Neuro-Oncology (EANO) and the Brain Tumor Group of the European Organisation for Research and Treatment of Cancer (EORTC) in April 2016 which contains 24 questions on current practice patterns as well as 8 case presentations. The results of this survey will be presented for the first time. They shall serve as the basis for treatment recommendations for this complication of systemic cancer that reflects current knowledge as well as current practice.

PS1 – 181

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Dural Metastases from Breast Cancer: A Case SeriesD.R. MacDonald¹, J.F. Megyesi, K.R. Potvin¹Western University London Regional Cancer Program, London, ON david.macdonald@lhsc.on.ca

Intracranial metastases from solid tumors are increasingly common, often brain or leptomeningeal metastases. Dural metastases are under-reported, present diagnostic and therapeutic challenges, and may mimic subdural hematoma or meningioma. This report describes 4 recent patients with dural metastases from breast cancer. A 60 year old woman, without known cancer, had 5 months of increasing headaches, left weakness, and focal seizures. Imaging showed an enlarging right frontal extra-axial enhancing mass with edema, initially thought to be a meningioma. At surgery the tumor involved overlying bone, replaced the dura, and invaded brain. Pathology was metastatic adenocarcinoma, ER/PR positive and Her-2 negative. Investigations showed a right breast primary, and lung and bone metastases. She received cranial radiotherapy (RT), letrozole and pamidronate. The tumor remains controlled after 40 months. The 3 other patients all had prior known breast cancer, 2 ER/PR positive and Her-2 negative, and 1 triple negative, ages 45-70 years. Two had known systemic metastases prior to neurological presentation. Presenting symptoms included headache, seizures, focal weakness, and confusion. All had new or progressive systemic metastases, including bone, at diagnosis of dural metastases. Two had resection of dural metastases, 1 with complicated postoperative course, with eventual improvement in both. Two received cranial RT, 1 refused RT, and all received hormonal or chemotherapy, with ongoing clinical or MRI control. These cases illustrate the complexity of dural metastases. Although patients often have extensive metastatic disease, treatment can improve symptoms and prolong survival.