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

S. Karimi¹, P.D. Tonge, L. Gonen, R. Tabasinejad, G. Zadeh, K. Aldape

¹Princess Margaret Cancer Centre, Toronto, ON
shirin.karimi@uhn.ca

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
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BRAIN METASTASES

PS1 -131

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

C. Tseng, University of Toronto, Toronto, ON
chia-lin.tseng@sunnybrook.ca

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

O. Cohen-Inbar^{1,2,3}

¹Department of Neurological Surgery, Rambam Health Care Center, Haifa Israel

²Molecular Immunology Laboratory, Technion Israel Institute of Technology

³Department of Neurosurgery and Gamma-Knife Center, University of Virginia, Charlottesville, Virginia
oc2f@virginia.edu

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).