OS4.4 LONG TERM FOLLOW UP OF RADIONECROTIC BRAIN METASTASES ASSESSED BY SERIAL F-DOPA PET/CT SCANS

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BACKGROUND AND AIM: Differential diagnosis between radionecrotic (RN) and progressive (PD) brain metastases from the others gaining unequivocal molecular diagnosis. Besides, TE97 sequence detected 2HG in the contralateral region in 3 cases, while TE97 sequences did not.

RESULTS: A total of 68 F-DOPA scans from 19 patients (11 F, 8 M) were evaluated. Median follow-up was 30.5 months (range:14–51). At the time of writing, 4 (21%) patients had died because of intracranial (n=3) or extracranial (n=1) PD. Ten (52%) metastases remained in histologically confirmed (n=4) or unconfirmed RN, while 9 (48%) showed a slow PD (n=3 histological confirmations). All progressive metastases showed a steady rSUVR (SUV max) increase; however, PET was false positive in one case of histologically confirmed RN. In two cases of confirmed RN (one histologically, one radiologically), there was an increase of rSUVR followed by a subsequent slight decrease. PET/CT and MRI were concordant in 12 (63%) and discordant in 7 (37%) cases. MRI was false negative in 4/10 (40%) cases of RN and false negative in 2/9 (22%) cases of PD.

CONCLUSION: Amino acid PET with F-DOPA is a reliable tool to assess the evolution over time of metastatic brain lesions after SRS, and performs better than MRI. Different patterns of F-DOPA uptake over time can discriminate with excellent diagnostic accuracy between PD and RN in the context of mixed viable and radionecrotic neoplastic cells.

OS4.6 LARGE-SCALE RADIOMIC PROFILING OF RECURRENT GILOBLASTOMA IDENTIFIES AN IMAGING PREDICTOR FOR STRATEGIZING ANTI-ANGIOGENIC TREATMENT RESPONSE

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BACKGROUND: Antiangiogenic treatment with bevacizumab, a monoclonal antibody to the vascular endothelial growth factor, is the single most widely used therapeutic agent for patients with recurrent glioblastoma (GB). A major challenge is that there are currently no validated biomarkers that can predict treatment outcome. Here we analyze the potential of radiomics, an emerging field of research that aims to utilize the full potential of medical imaging.

RESULTS: A total of 4842 quantitative MRI features were automatically extracted and analyzed from the multiparametric MRI of 127 patients (allocated to a discovery and validation set with a 2:1 ratio) with recurrent GB prior bevacizumab treatment. Leveraging a high throughput approach, radiomic features of patients in the discovery set were subjected to a supervised principal component (superpc) analysis to generate a prediction model for stratifying treatment outcome to antiangiogenic therapy by means of both progression free and overall survival (PFS and OS) and validated for patients in the validation set.

CONCLUSIONS: Our radiomic-based superpc signature emerges as a putative imaging biomarker for the identification of patients who may derive the maximal benefit from antiangiogenic therapy, avoiding the known on the non-invasive characterization of brain tumors, and stresses the role of radiomics as a novel tool for improving decision-support in cancer treatment at low cost.

OS4.7 CXCL13 IN CEREBROSPINAL FLUID (CSF) AS A BIOMARKER FOR PRIMARY CENTRAL NERVOUS SYSTEM CELL LYMPHOMA (PCNSL)

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INTRODUCTION: Malignant lymphoma cells are known to secrete various cytokines and chemokines. We previously reported that the CSF level of interleukin-10 (IL-10) was significantly increased in primary central nervous system lymphomas (PCNSLs), as compared with other brain diseases. Recently, CXCL13 level in CSF is reported to be useful biomarker for PCNSL. We analyzed CXCL13 levels in CSF and compared CSF CXCL13 with other CSF cytokines and prognosis.

METHODS: Seventy-nine CSF samples were analyzed. Twenty-five samples were PCNSL (all diffuse large B-cell lymphomas), 41 samples were gliomas, 4 samples were metastatic tumors, and 3 samples were other diseases. The CXCL13 levels were measured by ELISA. In addition, IL-10 and IL-6 in CSF were measured and compared with CXCL13 levels. Also, relationship between CXCL13 levels and prognosis (overall survival (OS) and progression-free survival (PFS)) was analyzed by Cox proportional hazards model.