30. RADIOSURGERY FOLLOWED BY TUMOR TREATING FIELDS FOR BRAIN METASTASES (1–10) FROM NSCLC IN THE PHASE 3 METIS TRIAL

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29. ROLE OF AGE AND CNS MYELOID CELLS ON BREAST CANCER BRAIN METASTASIS

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RESULTS: Stromal macrophages in breast tumors showed that rather than intrinsic tumor properties, extrinsic microenvironmental factors contribute to age-related differences in aggressiveness. The effect of age was examined by injecting brain-selected breast cancer cells into young (2–6 months) and older (>12 months) mice. In four breast metastasis models examined, young mice developed 2–16-fold (p < 0.05) more breast metastases compared to older mice. The effect of age was not observed in mouse breast cancer models that metastasize to liver and lungs, suggesting that this is an organ-specific phenomenon. Flow cytometry profiling of mouse brains showed that T-cells (CD4+, CD8+, and FOXP3+CD25+ regulatory T-cells), monocytes and neutrophils were elevated in brains with metastases, but the abundance of these populations did not vary dramatically with age. Furthermore, antibody-based depletion of T-cells, monocytes and neutrophils did not significantly alter brain tumor growth.

Microglia, which are resident CNS myeloid cells, were 1.5-fold more abundant in young brains compared to older brains. Depletion of CNS myeloid cells using the colony stimulating factor-1-receptor inhibitor PLX3397 reduced brain metastatic tumor burden in young mice by 2.1-fold (p < 0.001). Importantly, loss of CNS myeloid cells/microglia, which are normally more activated in aged mice and thus may protect the older brain against metastasis, did not augment brain metastasis formation in older mice. These results suggest the younger brain is more permissive for breast metastases and that targeting resident CNS myeloid cells may be an effective strategy to prevent brain metastasis development in younger patients.

30. RADIATION NECROSIS IN STEREOTACTIC RADIOSURGERY AND IMMUNE CHECKPOINT INHIBITORS FOR BRAIN METASTASES FROM LUNG ADENOCARCINOMA

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PURPOSE: Treatment with stereotactic radiosurgery (SRS) and immune checkpoint inhibitors (ICI) is increasingly common for brain metastases (BM) from lung adenocarcinoma. Rates of radiation necrosis (RN) with SRS in the setting of ICIs is an ongoing area of research. We investigated rates of RN in patients with BM from lung adenocarcinoma treated with SRS with or without concurrent ICIs. METHODS: We identified patients who underwent SRS at a single institution who were prescribed SRS for BM from lung adenocarcinoma. Of these, 19 (49%) received SRS without ICIs and 20 (51%) patients received ICIs within a month of SRS. The rate of RN, defined by MRI, was evaluated in the overall group as well as in patients stratified by age (<40 or >40 years old). RESULTS: Of all patients who received ICIs within a month of SRS, 11 (28%) patients developed RN defined by MRI and/or histologic evidence for RN. The rate of RN defined by MRI was 25% and 25% for patients treated with SRS alone and SRS with ICIs, respectively. CONCLUSION: Treatment with SRS alone and with ICIs does not increase the risk of RN.

31. RADIATION NECROSIS IN STEREOTACTIC RADIOSURGERY WITH BRAIN METASTASES

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PURPOSE: Recently, the RANO group has analyzed the additional diagnostic value of amino acid PET in patients with primary and secondary brain tumors and recommended the use of this imaging technique in addition to conventional MRI. Here, we investigated the value of PET using the radiolabeled amino acid O-[18F]fluorooxy-L-tyrosine (FET) for treatment monitoring of immune checkpoint inhibition (ICI) or targeted therapy (TT) alone or in combination with radiotherapy in patients with brain metastases (BM) since contrast-enhanced MRI often remains inconclusive. METHODS: We retrospectively identified 40 patients with 107 BM secondary to melanoma (n=29 with 75 BM) or non-small cell lung cancer (n=11 with 32 BM) treated with ICI or TT who had FET PET (n=60 scans) for treatment monitoring from 2013–2019. The majority of patients (n=37; 92.5%) had radiotherapy during the course of disease. In 27 patients, FET PET was used for the differentiation of treatment-related changes from BM relapse following ICI or TT. In 13 patients, FET PET was performed for response assessment at ICI or TT using baseline and follow-up scans (median time between scans, 4.2 months). In all lesions, static and dynamic FET PET