who initially received whole brain radiation therapy (WBRT) for 10 days, with dexamethasone for the first 8 days of radiation. Upon completion of WBRT, the patient developed rapidly worsening visual acuity, which subsequently improved with bilateral occipital craniotomy for tumor resection. CONCLUSIONS: Patients with bilateral occipital metastases may present with visual symptoms, including visual field loss, reduced visual acuity, and diplopia. The management of bilateral occipital metastases involves consideration of symptomatology, disease burden, and goals of care. Visual deficits frequently improve following treatment but may also develop in a minority of patients.

CMET-35. DIFFUSION AND PERFUSION FEATURES OF METASTATIC BRAIN LESIONS

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PURPOSE: To determine clinically relevant MRI features of various metastatic brain lesions using classical and advanced post-processing techniques of both diffusion and perfusion-weighted MR images. METHODS: One hundred twenty-three brain metastases including breast (27), non-small cell lung cancer (NSCLC, 43) and other (44) were retrospectively assessed prior to radiation treatment with standard anatomical, diffusion and perfusion-weighted MRI. A total of 346 individual lesions were manually segmented. Complementary to tumor volume, apparent diffusion coefficients (ADC) and relative cerebral volume (rCBV) measurements, an independent component analysis (ICA) was performed with dynamic susceptibility contrast (DSC) in order to assess arterio-venous components and their overlap region relative to tumor volume and time to peak of T2* signal from each component. RESULTS: Results suggests that no differences are observable for either ADC or rCBV features (median value) across metastatic subtypes. Interestingly, ICA-derived arterial component was higher in breast and NSCLC compared to other patients, while the venous component was higher in breast compared to all other groups. No difference in the overlap component was observed between groups. Within the other group, we found that overlap has higher volume than venous and arterial components. For other group, the difference between arterial and venous components was as well significant. Median time to peak of arterial and venous components were 8.4s and 12.6s with no differences between lesion types. Additionally, the overlap component was positively related to rCBV in all groups. However, no correlation was found for arterial and venous components with respect to rCBV values. CONCLUSIONS: Advanced ICA-derived component analysis demonstrates perfusion differences in metastatic brain lesions not observable with classical ADC and optimized rCBV post-processing approaches.

CMET-36. BEVACIZUMAB WITH OR WITHOUT LOMUSTINE FOR METASTATIC ORBITAL, DURAL AND LEPTOMENINGEAL ESTHESIONEUROBLASTOMA

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Esthesioneuroblastoma is a malignant neuroectodermal tumor originating from the olfactory neuroepithelium. Bevacizumab is a specific inhibitor of the vascular endothelial growth factor ligand, preventing its interaction with receptors on endothelial cells. Lomustine is a widely used alkylating agent with good CNS penetration. We report 3 cases of metastatic dural esthesioneuroblastoma that responded to bevacizumab with or without lomustine. All patients had been treated up-front for Kadish Stage D disease with craniofacial resection, radiation therapy, and platinum-based chemotherapy with or without etoposide. One patient had been treated for recurrence with temozolomide plus sunitinib. Recurrent disease consisted of leptomeningeal, dural, orbital, and skull metastases. Patients 1 and 2 were treated with bevacizumab, 5 mg/kg every 2 weeks; patient 3 also received lomustine 110 mg/sq m every 42 days for 6 cycles. Two patients had partial responses and 1 had stable disease. Responses consisted of reduction in dural contrast enhancement, tumor cyst volumes, and perilesional edema, along with symptomatic improvement. Mean progression free survival was 388 days, and overall survival 432 days. These patients with metastatic orbital, dural and leptomeningeal esthesioneuroblastoma achieved durable responses with bevacizumab with or without CCNU. Antiangiogenic and alkylating agent strategies may play a role in salvage therapy for this tumor.

CMET-37. SUSTAINED CLINICAL AND RADIOGRAPHIC RESPONSE IN AN ADULT PATIENT WITH LEPTOMENINGEAL METASTASES FROM ACUTE MYELOID LEUKEMIA TREATED WITH INTRAVENTRICULAR METHOTREXATE

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Leptomeningeal involvement (LMI) in adult acute myeloid leukemia (AML) patients is rare. Treatment is not standardized and includes intrathecal chemotherapy, radiation therapy and systemic chemotherapy. We present the case of a 23 year-old female diagnosed with AML in June 2017 initially treated with idarubicin and cytarabine followed by hematopoietic stem cell transplant. The patient presented 6 months later with headache, nausea, diplopia and ataxia. MRI of the brain and entire spine showed leptomeningeal carcinomatosis. Patient was initially treated with systemic cytarabine and idarubicin. This was immediately followed by IT methotheraxate 12 mg via an Ommaya reservoir twice a week for 4 weeks. Clinical improvement was noted after only 2 IT treatments. Interval MRI showed complete response of the leptomeningeal disease after 4 weeks. Treatment was continued once a week for another 4 weeks followed by a repeat MRI confirming complete radiographic response. CSF cytology done before every intrathecal treatment did not show any leukemic cells. IT methotrexate was discontinued and patient is currently being followed in the clinic. This report documents excellent sustained clinical and radiologic response to IT treatment of a rare neuro-oncologic condition without any significant adverse effects.

CMET-38. IMPACT ON THE CLINICAL COURSE OF EGFR MUTATION ON BRAIN METASTASES FROM NON-SMALL-CELL LUNG CANCER FROM VIEWPOINT OF NEURO-ONCOLOGISTS

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OBJECTIVE: Molecular and genetic alternations of non-small-cell lung cancer (NSCLC) now plays an important role in patient care of this neoplasm. The authors focused on the impact of EGFR mutation status on brain metastases (BM) from NSCLC to better understand the most desirable management of BM from NSCLC. METHODS: This was a retrospective observational study analyzing 266 patients with BM from NSCLC diagnosed between January 2008 and December 2015 in our institute. EGFR mutation, overall survival (OS), durations from diagnosis to brain metastases, and related factors with OS were measured. RESULTS: Among 266 patients, 127 patients (47.7%) had EGFR mutations. EGFR-mutant (EGFR-mt), compared with EGFR wild-type (EGFR-wt), showed longer median OS from diagnosis (40 vs 21 months, $P < 0.001$) and after BM diagnosis (22 vs 11 months, $P < 0.001$) and higher frequency of BM, around 80% of which occurred within 2 years. Good prognostic factors for OS were positive EGFR mutation (Hazard Ratio (HR) 0.64), no BM at diagnosis (HR 0.56), and single brain metastasis (HR 0.65). Patients harboring EGFR-mt single brain metastasis showed longer OS and durations from 1st brain metastasis to 2nd brain metastases than patients with either multiple BM or EGFR-wt BM. For those without BM at diagnosis, EGFR mutation status did not have any impact on OS (40 for EGFR-mt vs 37 months for EGFR-wt). CONCLUSIONS: Our study is in agreement with other studies that EGFR mutation is associated with prognosis of patients with BM from NSCLC. Results of our study also suggest that careful observation or screening for BM is recommended especially with the first 2 years for NSCLC patients with EGFR mutation. Aggressive treatments for EGFR-mt NSCLC patients with single BM should be considered taking into account that these patients could show prolonged survival after BM.

CMET-39. INTRA-CSF LIPOSOMAL CYTARABINE PLUS SYSTEMIC THERAPY AS INITIAL TREATMENT OF BREAST CANCER LEPTOMENINGEAL METASTASIS: A RANDOMISED, OPEN-LABEL TRIAL

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BACKGROUND: Intra-cerebrospinal fluid (CSF) therapy for the treatment of leptomeningeal metastasis (LM). remains controversial. METHODS: DEPOSEIN (NCT01645839) was a multicenter randomized open-label study exploring the efficacy of liposomal cytarabine added to standard-of-care systemic therapy for the treatment of LM from breast cancer. Inclusion was based on the identification of tumor cells in the CSF or typical clinical and magnetic resonance imaging (MRI) signs of LM. Patients were randomly assigned to receive systemic therapy alone (arm A) or in combination with intra-CSF liposomal cytarabine (arm B). Neurological and patient-reported outcomes (PRO) were performed monthly, cerebrospinal MRI every 2 months. The primary endpoint was progression-free survival in the leptomeningeal compartment (LM-PFS); 66 events were required to ensure 80% power for a hazard ratio of 0.5 (two-sided alpha=5%). RESULTS: Thirty-seven patients were assigned to arm A, 36 patients to arm B. Baseline characteristics were similar between arms. The median number of liposomal cytarabine injections in arm B was 5 (range 1–20). Focal radiotherapy was performed in 6 (16%) and 5 (14%) patients in arms A and B, respectively. Serious adverse events were reported in 20 and 27 patients in arms A and B. In the intent-to-treat population, median LM-PFS locally assessed was 2.0 months (95% confidence interval (CI) 1.3 2.7) in arm A versus 4.3 months (95% CI 2.3 5.7) in arm B (HR=0.57, 95% CI 0.35 0.92, p=0.02). Sixty-eight patients have died. Median OS was 4.0 months (95% CI 2.2–6.5) in arm A versus 7.3 months (95%CI 3.9–12.6) in arm B (HR=0.80, 95% CI 0.50–1.29, p=0.35). Centrally reviewed LM-PFS and PRO will also be reported. CONCLUSIONS: The addition of liposomal cytarabine to systemic therapy may improve LM-related PFS but may not significantly improve survival. PRO will be essential to determine a possible clinical benefit from intrathecal chemotherapy.

CMET-40. LONG-LASTING RESPONSE IN SPINAL METASTASES FROM ALK REARRANGED NON-SMALL-CELL LUNG CANCER TREATED WITH DIFFERENT ALK INHIBITORS

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INTRODUCTION: About 40% of ALK-rearranged NSCLC patients develop brain metastases (BM), while leptomeningeal metastases (LM) occur in 5% of patients, and spinal intramedullary metastases in < 1%. Few data are available regarding the efficacy of ALK inhibitors in neoplastic spinal disease from NSCLC. CASE-REPORT: In March 2014 a 55 year-old woman developed multiple BM after 2 years from the diagnosis of an ALK-rearranged NSCLC who was receiving crizotinib. Crizotinib was continued associated with WBRT with a near-CR (RANO criteria) lasting 12 months. One year later a spinal MRI displayed multiple intramedullary enhancing lesions and diffuse leptomeningeal spread along the cauda equina, with CSF positivity for neoplastic cells. Ceritinib was started and a CR both on MRI and CSF was obtained lasting 18 months. In December 2017 the patient developed bladder dysfunction and paralytic ileus due to multiple intramedullary spinal and leptomeningeal recurrences. Considering the higher BBB penetration of lorlatinib, the patient started the drug and achieved a significant improvement of the urinary incontinence and intestinal transit after 3 months. Conversely, no change of the extent of spinal disease was observed on MRI. At this time, the patient is continuing treatment with lorlatinib and she is free of recurrence since 5 months. DISCUSSION: The development of CNS disease in ALK-rearranged NSCLC has been suggested to be a natural evolution of the disease and/or is correlated to low CNS penetration of the molecular drugs that control the systemic disease. The PROFILE trials have shown longer OS in patients with BM who received crizotinib beyond progression, but data are lacking on the activity of second- and third-generation ALK inhibitors. CONCLUSION: This is the first report of a prolonged clinical and radiological response using sequentially different ALK inhibitors in a patient with concurrent LM and spinal intramedullary metastases from an ALK-rearranged NSCLC.

CMET-41. LIFETIME LUNG, BREAST, AND SKIN CANCER BRAIN METASTASES INCIDENCE: A REPRODUCIBLE SEER-MEDICARE STUDY

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INTRODUCTION: With improvements in cancer detection and primary cancer control, brain metastases (BM) become a greater concern. The Surveillance, Epidemiology, and End-Results (SEER) program recently released data on BM diagnosed at the same time as primary cancer, referred to as synchronous BM (SBM). Tentative evidence of lifetime BM (LBM) is present in Medicare claims, expanding the utility of these new SBM data. PURPOSE: This is a reproducible SEER-Medicare study estimating synchronous versus lifetime frequencies of BM for primary lung, breast, and skin cancers. MATERIALS AND METHODS: SEER data were linked to Medicare claims from 2007–2014 to identify incidence proportions (IP) and average annual age-adjusted incidence rates of SBM and LBM. SEER SBM data were linked to Medicare claims and used as a gold standard to evaluate Medicare BM algorithms, the classification performance of which informed similar estimates of LBM incidence. RESULTS: The IP of SEER SBM in lung, breast, and skin cancers was 9.6%, 0.3%, and 1.1%, respectively. The greatest SBM IP among lung cancer patients was 13.4% for non-small cell lung cancer, and among breast cancer patients was 0.7% for triple-negative breast cancer. The greatest LBM IP among lung cancers was 21.7% in small-cell lung cancer, 4.0% in triple negative cases for breast cancer, and 1.7% in nevi and melanomas. Concordance between Medicare claims and SEER regarding SBM was 0.61 (95% CI: 0.60 - 0.62) for lung cancer, 0.45 (95% CI: 0.39 - 0.51) for breast cancers, and 0.65 (95% CI: 0.59 - 0.70) for melanoma. Fewer SBM cases were found in Medicare claims than in SEER. CONCLUSIONS: These analyses provide a population-level glimpse into the natural history of BM, estimating both synchronous and lifetime incidence in lung, breast, and skin cancers using a large dataset that is representative of the US.

CMET-42. BONE METASTASIS PREDICTS POOR PROGNOSIS OF PATIENTS WITH BRAIN METASTASES FROM COLORECTAL CARCINOMA POST AGGRESSIVE TREATMENT

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The presence of brain metastasis (BM) in patients with colorectal cancer (CRC) is usually associated with terminal stage illness; however, a subgroup of patients receiving aggressive treatment can have a satisfactory prognosis. This study was designed to investigate the profile of prognostic factors in CRC patients with BM treated aggressively. CRC patients with BM were retrospectively reviewed. Survival analysis was performed to identify potential prognostic factors in the entire cohort of patients and a subgroup of patients treated aggressively. Aggressive treatments included surgical resection, radiotherapy, and/or chemotherapy. Overall survival (OS) was defined as the time between the diagnosis of BM and death or until the date of the last follow-up visit. A total of 78 CRC patients were confirmed as having BM. Sixty-eight of them had extracranial metastases at the time of their BM diagnosis. The most common sites of extracranial metastases were lung (n=51, 65.4%), followed by liver (n=25, 32.1%), and bone (n=12, 15.4%). Fifty-one patients who were treated aggressively had significantly longer OS than those who accepted palliative care (14.1 months vs. 2.0 months, p<0.0001). Multivariate analysis was applied and results showed that aggressive treatment (n=51), recursive partitioning analysis (RPA) class I/II (HR=0.27, 95% CI: 0.12–0.6, p=0.001), and fewer BM (HR=0.4, 95% CI: 0.21–0.78, p=0.07) predicted longer survival. In contrast, the presence of bone metastasis, rather than lung or liver metastasis, at the time of diagnosis of BM (HR=2.38, 95% CI: 1.08–5.28, p=0.032) predicted a poor prognosis. Although the prognosis of CRC patients that have BM is frequently very poor, those with good performance status and few brain lesions responded to aggressive treatment, while those with bone metastasis at the time of diagnosis of BM had relatively dismal survival rates, even when treated aggressively.

CMET-44. PREDICTORS OF SURVIVAL IN NEURO-METASTATIC MERKEL CELL CARCINOMA

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BACKGROUND: Merkel cell carcinoma (MCC) is a rare cutaneous malignancy of neuroendocrine origin, with about 30 cases of brain metastasis (BM) reported in the literature. Historically, the treatment of neuro-metastatic MCC has largely included chemotherapy (CT) and radiotherapy (RT). The aim was to investigate predictors of overall survival (OS) in neuro-metastatic MCC. METHODS: In this retrospective study, we surveyed institutional databases and additionally conducted a systematic review of the literature to identify cases reporting on management of distant MCC BM. A pooled analysis was performed on the institutional and literature cases to assess predictors of OS. Survival analysis was done on R (ver 3.4.0) using a Log Rank statistic and cox proportional hazard