comprising a total of 665 participants with ALKI-naive ALK+ lung cancer brain metastases were included. When compared pair-wise to CRZ, ALC (RR=0.49;95%CI:0.36–0.66), BRG (RR=0.39;95%CI:0.24–0.64), and CER (RR=0.36;95%CI:0.19–0.68) demonstrated significantly superior response rates in patients with untreated or previously treated lung cancer brain metastases. When the efficacy of each ALKI was compared to each other, BRG and CER were ranked the highest followed by ALC then CRZ in decreasing order. CONCLUSIONS: This network meta-analysis is the first to compare and rank ALKIs used in treating metastatic ALK+ lung cancer. It indicates that BRG, CER, and ALC are better therapeutic options for patients with ALK-naive ALK+ lung cancer brain metastases when compared to CRZ.

23. RETROSPECTIVE REVIEW OF ADULT PATIENTS WITH LEPTOMENINGEAL DISEASE SECONDARY TO MELANOMA AT MOFFITT CANCER CENTER: DIAGNOSIS, TREATMENT AND OUTCOMES.

Yolanda Pina, Brittany Evernden, Keiran Smalley, and Peter Forsyth; Moffitt Cancer Center, Tampa, FL, USA

BACKGROUND: Nearly 5–8% of solid cancers present with leptomeningeal disease (LMD). Patients with LMD have a dismal prognosis with survival measured in weeks-to-months. The pathophysiology of this devastating disease remains unknown. METHODS: A retrospective chart review was performed of twenty-five adult patients with LMD due to melanoma who were enrolled in the MCC 50172 clinical trial between 05/26/2015 and 07/17/2018. RESULTS: Patients had a median age 63 years (31–80) at diagnosis with LMD. Sixteen had confirmed LMD and five did not meet criteria for LMD, but had positive cerebrospinal fluid (CSF)-circulating tumor cells (CTC's). Those with LMD had a median KPS of 70 (30–90) at presentation, and symptoms most commonly included altered mentation n=6 (37%), headaches n=4 (25%), focal weakness n=3 (19%), and paresthesia n=2 (12%). Eleven patients were diagnosed by MRI. Ten patients (62%) had positive CSF cytology on first attempt and fourteen (87%) on first-two attempts. Lumbar puncture mean OP was 29.4 cmH2O (18–65), with CSF WBC 21.8/cumm (SD 25.6), RBC 2942.5/cumm (SD 9056.1), and protein 187.6 mg/dL (SD 166.1). CSF-CTC's CellSearch analysis had a sensitivity of 0.75 (12[12 + 4]) and specificity of 0.44 (4[4 + 5]); PPV 0.71 and NPV 0.50. Twelve patients with LMD had positive CSF-CTC's. Prior to LMD diagnosis, patients were treated with immune checkpoint inhibitors (ICI's) n=9 (56%), BRAF+/-MEK inhibitors n=5 (31%), and/or RT n=5 (31%). Patients with LMD were treated with Ommaya n=13 +VPS n=3, WBRT n=7, ICI's n=5, BRAF+MEK inhibitors n=4, and IT topotecan. LMD patients had a median survival 3.27 months after diagnosis (0.30–39). Two patients outlived their counterparts by 21.1 and 39.0 months. The 2 long-term survivors were treated with WBRT and either ICI, pembrolizumab or ipilimumab+nivolumab. CONCLUSION: Clinical studies in LMD can provide critical insights and help to develop improved guidelines and current therapies.

24. LOCAL TUMOR PROGRESSION IS A RISK FACTOR FOR POSTOPERATIVE SEIZURES IN PATIENTS WITH BRAIN METASTASIS

Bettina Grossenbacher[1], Selina Moors[1], Anna Lareida[1], Patrick Roth[1], Lukas Imbach[1], Emilie Le Rhun[1,2], Michael Weller[1], and FabianWolpert[1]; [1]Department of Neurology and Brain Tumor Center, University Hospital and University of Zurich, Zurich, Switzerland, [2]Neuro-oncology, Department of Neurosurgery, University Hospital Lille, Lille, France

PURPOSE: Brain tumor-related epilepsy (BTRE) occurs in 20–35% of patients with brain metastases (BM) and influences morbidity, mortality as well as quality of life. Several factors associated with seizure risk have been identified, including incomplete resection and supratentorial localization of BM. In primary brain tumors like lower grade glioma, tumor growth is associated with seizures. However, it remains to be elucidated whether this holds also true for patients with BM. METHOD: We identified 295 patients who had been diagnosed with BM between 2004 and 2014 by review of our electronic chart system. Occurrence of new onset of postoperative seizures dependent on BM progression was tested during the clinical course as well as pattern of progression and previously described predictors of postoperative seizures. Chi-square test was used for univariate analysis, a Cox-regression model for multivariate testing. RESULTS: Postoperative seizures were observed in 49 of 295 patients (16.6%). Supratentorial localization (p=0.043, OR 4.45, 95% CI 1.1–19.3) and incomplete resection (p=0.018, OR 3.68, 95% CI 1.4–10.9), along with intracranial (p=0.038, OR 1.4, 95% CI 1.4–5.8) but not extracranial progression (p=0.729, OR 0.90, 95% CI 0.4–1.7) were confirmed as factors independently associated with postoperative seizures. Furthermore, there was a significantly higher rate of postoperatives seizures in patients with local progression (18 of 84 patients, 21.4 %) compared to those with distant brain progression (12 of 93 patients, 12.9%, p=0.042, Chi-square test). CONCLUSION: Here we define tumor progression as a risk factor for the development of postoperative seizures in a well defined cohort of BM patients. Extracranial tumor recurrence seems to be not significant for seizure risk. Subgroup analysis indicates that patients with local progression of BM are more prone to seizures than those with new, distant BM lesions. Patients with local tumor recurrence might thus be candidates for primary prophylaxis with antiepileptic drugs.

25. EFFECT OF STEREOTACTIC RADIOSURGERY COMPARED TO WHOLE-BRAIN RADIOTHERAPY FOR LIMITED BRAIN METASTASIS ON LONG TERM COGNITION AND QUALITY OF LIFE: A POOLED ANALYSIS OF NCCTG N107C/CEC.3 AND N0574 (ALLIANCE) RANDOMIZED CLINICAL TRIALS

Joshua Palmer[1], Brett Klamer[1], Karla Ballman[2], Paul Brown[3], Jane Cerhan[4], Keith Anderson[4], Anthony Whitton[5], Jeffrey Greenspoon[5], Caroline Chung[6], Stuart Burri[7], Ian Parney[4], Volker Stieber[8], Bruce Pollock[4], Nadia Laack[3], Jonathon Ashman[9], Jean-Paul Bahary[10], Fred Barker[11], Evanthia Galanis[3], Anthony Asher[12], and David Roberge[10]; [1]The James Cancer Hospital at The Ohio State University, Columbus, OH, USA, [2]Weill Medical College of Cornell University, New York, NY, USA, [3]Mayo Clinic, Rochester, MN, USA, [4]Mayo Clinic, Rochester, MN, USA, [5]Juravinski Cancer Centre, Hamilton, ON, Canada, [6]The University of Texas MD Anderson Cancer Center, Houston, TX, USA, [7]Levine Cancer Institute, Charlotte, NC, USA, [8]Novant Health Forsyth Medical Center, Winston-Salem, NC, USA, [9]Mayo Clinic, Phoenix, AZ, USA, [10]CHUM-Notre Dame, Montreal, QC, Canada, [11]Massachusetts General Hospital Cancer Center, Boston, MA, USA, [12]Carolina Neurosurgery and Spine Associates, Charlotte, NC, USA

PURPOSE: We investigated the long term impact of SRS and WBRT in two large prospective phase III trials. METHODS: Patients with 1–4 BMs +/- resection were randomized to SRS or WBRT. Cognitive deterioration was a drop of >1 standard deviation from baseline in >2/6 cognitive measures (CM). Quality of life (QOL) scores were scored 0–100 point scale. CM and QOL scores were modeled using baseline adjusted Linear Mixed Models (LMM) with uncorrelated random intercept for subject and random slopes for time. Differences in trend over time between groups and the effect of >2 cognitive scores with >2 SD change from baseline were assessed. RESULTS: 88 patients were included with median follow up of 24 months. We observed decreasing CM over time (SRS: 4/6; WBRT: 5/6). Mean CM was significantly higher in SRS for Total recall and Delayed Recall at 3, 6, 9, 12 months. More patients in WBRT arm declined 1 SD in >1 and >2 CM at the 3, 6, 9, and 12 months. A 1 SD decline in >3 CM at 1 year was 21% SRS vs 47% WBRT (p=0.02). SRS had fewer patients with a 2 SD decline in >1 CM at every time point. SRS had fewer patients with a 2 SD decline at >2 and >3 CM. WBRT had lower QOL at 3 months, but switched to SRS having lower QOL at 24 months for PWB, EWB, FWB, FactG, BR, and FactBR (p<0.05). A 2 SD decline in cognition decreased mean FWB by 6.4 units (95% CI: -11, -1.75; p=0.007) and decreased QOL by 5.1 units (95% CI: -7.7, -2.5; p<0.001). CONCLUSIONS: We report the first pooled prospective study demonstrating the long term outcomes of patients with BMs after cranial radiation. WBRT was associated with worse cognitive outcomes. Impaired cognition is associated with worse QOL.

26. GENETIC CHARACTERIZATION OF SELLAR METASTASIS FROM PRIMARY BRONCHIAL CARCINOID TUMOR OF NEUROENDOCRINE PATHOLOGY

Christopher Hong, Declan McGuone, E. Zeynep Erson-Omay, and Sacit Bulent Omay; Yale University School of Medicine, New Haven, CT, USA

Metastasis to the pituitary gland and surrounding sellar region from systemic tumors is a rare occurrence. Patients may present with signs of endocrine dysfunction secondary to pituitary involvement, as well as mass effect-related symptoms including headaches and visual deficits. Despite a small but accumulating body of literature describing the clinical and histopathological correlates for sellar metastases from systemic tumors, the genetic alterations underlying sellar spread have not been previously described. We describe a 68 year-old female with history of a resected lung carcinoid tumor, followed by chemoradiation, who was diagnosed with a sellar lesion on surveillance PET-CT and subsequent brain MRI. Her tumor was resected via an endoscopic endonasal approach, and final pathology was consistent with neuroendocrine origin, including positive immunohistochemistry for synpatophysin, CK7, TTF-1, and CAM5.2 with a Ki-67 index of 8–12%. Whole-exome sequencing of the sellar specimen demonstrated large-scale deletions of chromosomes 3, 6, and 9 and focal deletions on chromosomes 1,2, 11, 15, and 16. Mutational signature analysis was enriched for COSMIC Signature 4, seen in multiple primary lung cancers. Among 91 total somatic alterations, 7 had been previously associated with oncogenesis (*MYO18A,*