CMET-31. INTRACEREBRAL HEMORRHAGE FROM NEOPLASTIC ANEURYSM AS FIRST MANIFESTATION OF LUNG CANCER

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Clinical trial results for metastatic brain tumors (MBs) were presented at the 2018 CNS meeting, with a focus on the role of T790M in acquired resistance to TKIs.

**CMET-29. PRE-OPERATIVE DURAL CONTACT IS ASSOCIATED WITH SURGICAL CAVITY RECURRENCE AFTER POST-OPERATIVE STEREOTACTIC RADIOSURGERY**

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**BACKGROUND:** Brain metastases can be expected in 20–40% of patients diagnosed with cancer. Resection of a solitary or symptomatic brain metastasis provides immediate decompression and has the potential to improve overall survival, generally with some form of adjuvant postoperative radiation to reduce risk of recurrence. We sought to evaluate risk factors for local recurrence after postoperative single-fraction stereotactic radiosurgery (SRS).**METHODS:** Patients who underwent surgical resection of a brain metastasis between 2006 and 2016 were retrospectively reviewed. Characteristics of the pre-surgical tumor, surgical resection, and post-surgical treatment were collected. Patients who received single-fraction stereotactic radiosurgery to the surgical bed were included for analysis. Surgical cavity recurrences were evaluated based on the location of their centroid within the dose distribution and categorized as in-field, marginal, and out-of-field. RESULTS: A total of 38 patients with 60 resection cavities receiving post-operative SRS met the criteria for inclusion in study. During a median follow up of 20 months, 12 patients were noted to have surgical cavity recurrences with actuarial 1 and 2-year local failure rates of 15% and 18% respectively. Of the recurrences, 5 were in-field, 5 were marginal, and 4 were out of field. Evaluation of pre-operative tumor characteristics and post-operative cavity size did not predict recurrence. Dural/meningeal contact had a significantly higher risk of local failure using Fishers exact test (p=0.025). Quadratic-mean-diameter, target volume, dose, and conformity index were not significantly associated with local recurrence. A post-operative rate of adverse radiation effect (ARE) was 8% in this cohort. CONCLUSION: Dural/meningeal contact was associated with an increased risk of surgical cavity failure in patients undergoing post-operative SRS. In light of these results, and the recent consensus guidelines regarding contouring of post-operative surgical cavity for SRS, further consideration should be the addition of a dural margin in post-operative surgical cavity target delineation.

**CMET-30. BRAIN METASTASES FROM EGFR-MUTATED NSCLC WHICH HAD ACQUIRED RESISTANCE TO EGFR-TKI: LESS-FREQUENT T790M AND PRESERVED RESPONSE TO OTHER TKIs**

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**BACKGROUND:** Despite the favorable response, most brain metastases (MBs) acquire resistance to TKIs. T790M is the most common mechanism and accounts for approximately half of acquired resistance to TKIs. The aim of this study is to clarify the role of T790M in the acquired resistance of BMs, and optimal treatment for BMs progressed after TKI.**METHOD:** Uptfront TKI was performed for BMs from EGFR-mutated NSCLC, and TKI was changed at progression. Gefitinib, erlotinib, afatinib and osimertinib were used and the selection of these TKIs were owing to the physicians’ decision. During the disease course, re-biopsies of progressing diseases were performed to verify mutations of EGFR, and the incidence of T790M were compared among the organs biopsied. The time to CNS-progression (TCP) were evaluated for each TKI. RESULTS: 141 cases were enrolled. Gefitinib was used only as the first line TKI (n=91). Afatinib (n=21) and osimertinib (n=17) were selected for only recurrent cases. TCPs after gefitinib, erlotinib, afatinib, and osimertinib were 13.4, 20.1, 19.9, and 13.8 months respectively. The history of treatment did not affect the TCP after erlotinib (HR=1.37, 95%CI:0.61–3.25, P=0.451). Re-evaluations of EGFR was performed using 107 samples (lung:51, serum:25, CNS:22, others:9) from 88 cases. The incidence of T790M from CNS samples was 9.1% (Tumor:1/6, CNS:2/16), and was significantly lower than that of BMs (lung:50.1%, serum:28.0%, others:44.4%) (Odds ratio:0.130, P=0.001). The extremely low incidence of T790M and satisfied effects of TKIs even after TKI-failure suggested the different mechanism of acquired resistance of BMs to TKIs in compared with the extracranial lesions. CONCLUSIONS: T790M progressed only a limited role in acquired resistance of BMs to TKIs, and alterations of the types of TKIs were still recommended for the progressed BMs after TKI.

**CMET-31. INTRACEREBRAL HEMORRHAGE FROM NEOPLASTIC ANEURYSM AS FIRST MANIFESTATION OF LUNG CANCER**

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**BACKGROUND:** Metastatic cerebral aneurysms are an extremely rare complication of cancer. We present a case of an intracerebral hemorrhage (ICH) secondary to a neoplastic aneurysm as the initial manifestation of lung cancer. **CASE REPORT:** A 63-year-old man presented with acute aphasia and was found to have a left parieto-temporal ICH on brain imaging. Angiography demonstrated a fusiform dilation of the distal left middle cerebral artery suspicious for a neoplastic aneurysm. Initial high-resolution CT showed intraventricular and intraparenchymal hemorrhage. Pathology showed intravascular tumoral cells identical to those visualized in the aneurysm, with final pathology consistent with poorly differentiated lung adenocarcinoma (EGFR, ALK and KRAS negative). The patient subsequently received Gamma Knife radiosurgery to the surgical bed, followed by carboptaxol, pemetrexed and pembrolizumab for treatment of his systemic disease. **DISCUSSION:** Tumoral intracerebral aneurysms are rare, with about 100 cases published in the literature, the majority of them arising from cardiac myxoma or choriocarcinoma. Only six cases of neoplastic cerebral aneurysms from metastatic lung cancer have been reported, all presenting as ICH. Four of them died as a result of the hemorrhage, and the remaining two had complications that precluded the administration of further therapy, making ours the first case to receive cancer-directed treatment aimed at the aneurysmal metastatic lesion. **CONCLUSION:** Neoplastic cerebral aneurysms are rare, but should be considered in patients with malignancy presenting with a pattern of ICH suspicious for aneurysmal origin. There are no guidelines regarding the treatment of these uncommon aneurysms, but based on our case, we suggest approaching them as any other cerebral metastasis, with complete resection whenever possible, followed by stereotactic radiosurgery.

**CMET-32. BILATERAL OCCIPITAL METASTASES: MANAGEMENT CONSIDERATIONS AND CORtical BLINDNESS**

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**INTRODUCTION:** Treatment decisions for brain metastases balance potential benefits of tumor control, symptom alleviation, and survival, with the risk of functional impairment or reduced quality of life. Bilateral occipital metastases pose a risk of significant visual deficits and even cortical blindness, with an unclear rate of resolution and development of these debilitating symptoms following resection or radiotherapy. METHODOLOGY: We retrospectively reviewed all cases of bilateral occipital metastases treated with surgery and/or radiotherapy between 2008–2017 at the Brigham and Women’s Hospital. RESULTS: 18 patients with bilateral occipital metastases (median age 64 years; 13 women, 5 men) were identified. The most frequent primary cancer sites were lung (56%), melanoma (17%) and breast (11%). Visual symptoms were present in 67% of all cases, of which 67% had a visual field deficit, 17% had diplopia, and 17% had an acute visual decline. These metastases were initially managed with resection (44%), BMs to TKIs (28%), or both (28%). In patients who initially presented with visual symptoms, 75% improved with treatment while 25% remained stable. In those who presented with no visual symptoms, 67% remained stable at baseline, 17% worsened acutely, and 17% worsened permanently with treatment. The majority of patients were also managed with post-treatment steroids. A representative case illustration is discussed of a patient after gefitinib (n=51). Afatinib (n=21) and osimertinib (n=17) were selected for only recurrent cases. TCPs after gefitinib, erlotinib, afatinib, and osimertinib were 13.4, 20.1, 19.9, and 13.8 months respectively. The history of treatment did not affect the TCP after erlotinib (HR=1.37, 95%CI:0.61–3.25, P=0.451). Re-evaluations of EGFR was performed using 107 samples (lung:51, serum:25, CNS:22, others:9) from 88 cases. The incidence of T790M from CNS samples was 9.1% (Tumor:1/6, CNS:2/16), and was significantly lower than that of BMs (lung:50.1%, serum:28.0%, others:44.4%) (Odds ratio:0.130, P=0.001). The extremely low incidence of T790M and satisfied effects of TKIs even after TKI-failure suggested the different mechanism of acquired resistance of BMs to TKIs in compared with the extracranial lesions. CONCLUSIONS: T790M progressed only a limited role in acquired resistance of BMs to TKIs, and alterations of the types of TKIs were still recommended for the progressed BMs after TKI.