expression or amplification and 4 were positive. The median survival of the 16 patients with BM was 15.8 mos. No difference in survival from time of diagnosis was found between HER2 positive (n=4) and HER2 negative groups (n=12) (p=0.05 vs. 14.2). There was no difference in survival from time of diagnosis to development of BM was 13.6 mo. for all patients, with no difference by HER2 status (p=0.13 vs. neg. 14.2 mos.). Median survival from the time of BM diagnosis was 24.0 mos. CONCLUSIONS: BM in GBC patients was found in 4% of GAD patients. HER2 positivity was slightly more common in the BM group than in the general GAD population. HER2 positivity did not affect survival when compared to the HER2 negative group. Updated results for HER2 status of our series of BM will be presented.

**BMET-30. TREATMENT OPTIONS OF LONG TERM SURVIVORS WITH LEPTOMENINGEAL METASTASES AND BREAST CANCER**

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**INTRODUCTION:** Leptomeningeal metastases (LM) is a devastating complication of cancer. We previously reported a study of 318 breast cancer (BC) patients with LM and a median survival of 3.5 months. However, 63 (20%) of patients were long term survivors (LTS), alive after 1 year. This study describes treatments received after the LM diagnosis by these LTS. METHODS: Clinical, pathologic, and treatment information were collected in 1963 LTS patients registered previously identified from a MGH database from January 1995 to June 2013. RESULTS: Among LTS, median age was 54 years (range 24-80). Median KPS at LM diagnosis was 80 (70-100). Twenty-two patients (33%) were HER2-positive, 51 (81%) hormone receptor positive and 33 (53%) were triple-negative. Median of LM diagnosis was 20 months (range 12.3-118). After LM diagnosis, 62 patients (98%) received systemic treatment, while only 133/253 (53%) patients who lived less than 1 year received chemotherapy. Hormone therapy was the first regimen in 18% patients; cytotoxic chemotherapy (CC) combined with HER2-directed therapy in 26%; CC alone in 38%; Bevacizumab in combination with CC in 2%; HER2-directed therapy alone in 6%; HT combined with HER2-directed therapy in 3%; and HT with CC in 6% patients. Furthermore patients (84%) received second line chemothera

**BMET-31. DETECTION OF EGFR MUTATIONS IN THE CEREBROSPINAL FLUID OF NON-SMALL CELL LUNG CANCERS**

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**INTRODUCTION:** Detection of Epidermal Growth Factor Receptor (EGFR) mutational status is required to determine optimal treatment of non-small cell lung cancer (NSCLC). PATIENTS AND METHODS: In this retrospective cohort, we evaluated EGFR mutational status including the resistance T790M mutation in 38 NSCLC patients presenting with leptomeningeal metastasis (LM) between 2012 and 2016. RESULTS: Among the 16 patients with LM, 13 had an EGFR mutation (exon 19, n=7; exon 21, n=6), 1 had a KRAS mutation, 1 had an ALK rearrangement, and 1 a HER2 mutation. LM diagnosis was made after a median of 19 months (range, 9-31) after lung cancer diagnosis. CSF molecular analyses were performed at LM diagnosis (n=12) or for the evaluation of mutations during the management of a known LM (n=4). At the time of molecular CSF analysis, malignant cells were observed in the CSF in 13 patients (34%). The known mutational alteration was found in CSF in 11 of 13 initially EGFR mutated patients. A supplementary EGFR T790M mutation was detected in the CSF of one patient. In another patient, the EGFR mutation was detected whereas no malignant cells were observed using standard cytology. Initial treatments for EGFR-mutated LM included first- or second-generation tyrosine kinase inhibitors (TKI, n=9) systemic chemotherapy (n=5), immunotherapy (n=1) and intra-CSF liposomal cytarabine combined with systemic treatment (n=8) or alone (n=1). Median time from diagnosis to development of BM was 13.6 mo. for all patients, with no difference by HER2 status (p=0.13 vs. neg. 14.2 mos.). Median survival from the time of BM diagnosis was 24.0 mos. CONCLUSIONS: BM in GBC patients was found in 4% of GAD patients. HER2 positivity was slightly more common in the BM group than in the general GAD population. HER2 positivity did not affect survival when compared to the HER2 negative group. Updated results for HER2 status of our series of BM will be presented.

**BMET-32. HOSPICE ENROLLMENT PATTERNS IN MEDICARE BENEFICIARIES WITH BRAIN METASTASES**

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**INTRODUCTION:** Brain metastases (BM) are the most common intracranial tumors with the highest incidence occurring in elderly populations. Given their limited survival in conjunction with significant symptom burden and cognitive impairment, patients with BM are likely to benefit from hospice enrollment. This study evaluates regional hospice enrollment patterns in elderly patients with BM. METHODS: Administrative claims were obtained for Medicare Beneficiaries with BM from 2012-2015 within the UAB Health System Cancer Community Network including AL, FL, GA, MS, and TN. Hospice enrollment patterns were recorded as early (<2 weeks prior to death), late (3-14 days prior to death) or very late (<6 days prior to death). Logistic regression analysis was performed to determine if demographic factors were associated with hospice enrollment patterns.

RESULTS: Among 948 patients with BM who died during the claims period, there were 378 (40%) early, 251 (27%) late, and 99 (10%) very late hospice enrollment. Median time from hospice enrollment to death was 16 days. In multivariable analysis controlling for other demographic factors, non-white patients were less likely than their white counterparts to receive any hospice referral OR (95% CI) 0.43 (0.30-0.64). Median time from hospice enrollment to death was less likely than males to receive a very late referral (OR 0.37, 95% CI 0.14-0.98, p=0.045). Very late or no enrollment occurred in 34% of BM patients versus 24% (n=383) of patients with primary malignant brain tumors within the same hospital network (p=0.001). CONCLUSION: Late hospice enrollment (within the last 2 weeks of life) in Medicare patients with BM is common (60%). BM patients of male gender and/or non-white race are significantly less likely to have timely hospice enrollment, as are patients with BM versus primary brain tumors.

**BMET-33. MORBIDITY AND MORTALITY OF OMMAYA RESERVOIR PLACEMENT FOR INTRAVENTRICULAR CHEMOTHERAPY**

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**BACKGROUND:** In 1963, a Pakistani neurosurgeon by the name of Ayub Omamyas proposed a surgical technique for subcutaneous reservoir and pump placement to allow access to intraventricular cerebrospinal fluid (CSF). Currently, the most common indication for Ommaya reservoir placement is for patients with hematologic or leptomeningeal disorders. We wished to examine short- and long-term outcomes in patients treated with Ommaya reservoirs at our institution. METH:

**METHODS:** We retrospectively evaluated all operative cases of Ommaya reservoir insertion from 2000-2014 by the senior author (JFM). Patient demographic data, surgical outcomes, peri-operative complications, and long-term outcomes were collected. RESULTS: 28 patients underwent image-guided Ommaya reservoir insertion by the senior author (JFM) over the study period (43.3±17.3 years; 35.7% female). The most common indication for placement was acute lymphoblastic leukemia, diffuse large B-cell lymphoma, and leptomeningeal carcinoma. There were two complications: one asymptomatic peri-operative intracranial hemorrhage (3.6%), and one early infection (3.6%) requiring hospitalization. There were two complications: one asymptomatic peri-operative intracranial hemorrhage (3.6%), and one early infection (3.6%) requiring hospitalization. Two patients died (7.1%) within 1 year of Ommaya reservoir placement. The median follow-up was 4.5 years (range, 1-11.2 years). CONCLUSIONS: Our findings suggest minimal short-term morbidity with improved accuracy and decreased complications using an image-guided approach compared with a traditional approach. There were no peri-operative deaths in our series. Our results support routine use of intra-operative image guidance for proximal catheter insertion in elective Ommaya reservoir placement for intraventricular chemotherapy.