

# **SURG-10. MELANOMA CEREBRAL METASTASES IN IRELAND-GETTING UNDER THE SKIN**

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**BACKGROUND:** Ireland has the highest rate of melanoma related deaths in Europe. Despite the incidence of melanoma reaching record highs there remains a paucity of information in Ireland regarding the factors associated with melanoma brain metastasis (MBM). **METHODS:** Patients diagnosed with MBM in Ireland were retrospectively identified in Beaumont Hospital between 1999 and 2018. Patient demographics; year of detection of MBM, age at diagnosis of primary melanoma, age at detection of MBM, anatomical location of primary melanoma, BRAF mutation analysis and the number of metastases were investigated. Follow up data was also derived, including overall survival (OS). **RESULTS:** The incidence of malignant melanoma has increased by 158% over the past 20 years with 1,092 and 422 cases diagnosed in 2018 and 1999, respectively. 128 patients with melanoma brain metastases were identified during this period. The median OS after detection of MBM was 5 months (95% CI 0.641–9.359 months). There was a male predominance (n= 77/128; 60%) with a median age of death at 58 years (n=67; range 16–82 years). Although females had a significantly longer time between diagnosis of primary melanoma and detection of MBM compared to males, 4 and 2 years respectively (p=0.02442), there was no significant age difference at death between males and females (p= 0.41294). BRAF mutation was an independent prognostic factor with an improved overall survival compared to those without the mutation, of 8 months and 3.5 months respectively (p=0.0012). Although non significant, the primary location of melanoma, leptomeningeal disease and number of cerebral metastases were all important considerations in this group. **CONCLUSIONS:** Male predominance and BRAF mutation represent important factors in this population group. The results of this study add to our knowledge concerning outcomes in melanoma brain metastases in Ireland, and may be useful in clinical planning, educational programs and future treatments.

# **SURG-11. THE ROLE OF MAGNETIC RESONANCE-GUIDED LASER ABLATION FOR INTRACRANIAL METASTATIC TUMORS**

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**INTRODUCTION:** Laser interstitial thermal therapy (LITT) is a novel, minimally-invasive adjuvant therapy that is well-suited for intracranial tumors in deep or critical areas, recurrences failing standard therapy, and poor open-surgical candidates. To better characterize safety and clinical outcomes, we present the largest single-institutional experience with LITT for recurrent brain metastases. **METHODS:** All patients undergoing LITT for single recurrent brain metastases from 2013–2018 at the University of Miami were included in this study. Primary outcomes included extent of ablation (EOA), time-to-recurrence (TTR), and overall survival (OS). Secondary endpoints include neurologic status and complication rate. Kaplan-Meier survival analysis was performed to quantify TTR and OS, compare outcomes by primary tumor of origin, and identify potential predictors of TTR and OS. **RESULTS:** Thirty-six patients underwent 44 LITT procedures; all had undergone prior treatment with stereotactic radiosurgery (SRS). Mean age was 56.8 years and 83.3% were female. Average pretreatment tumor volume was 6.6cm<sup>3</sup>. Patients were treated with a mean ablation dose of 12.4W (9.8–14W), achieving a median EOA of 100% (range 55–100%). At median follow-up of 11.6 months (IQR 4.6–19.1 months), 34 of 44 (87.3%) cases had tumor control on radiographic imaging and 22 of 36 (61.1%) of patients remain alive. Median TTR was 55.9 months; median OS was 25.5 months. Neither TTR nor OS differed significantly by primary tumor of origin (P > .05). EOA >88% predicted longer TTR (P=.01) Neurologic status was stable or improved in all surviving patients. No major complications occurred (0% rate). **CONCLUSIONS:** Our institutional experience demonstrates LITT is safe for intracranial metastases resistant to SRS and offers several advantages over open surgical treatment. TTR and OS were not associated with primary tumor of origin. A threshold EOA >88% predicted longer TTR. Randomized studies are needed to evaluate the role of LITT as a treatment adjunct.

# **SURG-12. A COMPARISON BETWEEN PROGNOSTIC SCORES OF BREAST CANCER BRAIN METASTASES APPLIED TO A NEUROSURGICAL POPULATION**

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**INTRODUCTION:** Prognostic scores have been developed to predict overall survival (OS) in patients with brain metastasis from breast cancer, comprising different combinations of prognostic factors. A new prognostic score including the number of brain metastases has been proposed. We aimed to evaluate the use of these prognostic scores on a neurosurgical population. **METHODS:** Retrospective study with consecutive patients with brain metastasis from breast cancer treated in the neurosurgery department. Clinical end point is overall survival estimated by the Kaplan Meier method. Univariate and multivariate Cox proportional hazard models are applied to estimate the effect of covariates of interest on OS. We employ Bootstrap validation method to estimate the bias-corrected or over fitting-corrected predictive accuracy of Cox models, which is presented by concordance index(C-index). **RESULTS:** 315 consecutive patients with brain metastasis from breast cancer. Median OS was 14 months(95% CI 11–16.9), KPS, number of brain metastases, biological subtypes, age and presence of extracranial metastases were significantly associated with improved OS on the univariate analysis. Multivariate analysis showed that KPS, biological subtype, age and number of brain metastases were statistically significant for OS. The recursive partitioning analysis(RPA) classes, the graded prognostic assessment(GPA) score, the diagnostic specific GPA(DS-GPA) and the modified DS-GPA identified individual subgroups with different OS. RPA and DS-GPA had OS statistical significant between all groups with a C-index of 0.561 and 0.586 respectively. DS-GPA had a c-index of 0.639 and modified DS-GPA had a c-index of 0.637. DS-GPA and modified DS-GPA had a better performance in terms of discrimination when compared to RPA(p< 0.001) and GPA(p=0.01). **CONCLUSIONS:** DS-GPA and modified DS-GPA were able to better discriminate subgroups OS, which most likely reflects the use of biological subtype in the score calculation. The incorporation of number of BM by the modified DS-GPA improved the distinction between the higher score and the lower score group.

# **SURG-13. EVALUATION OF 5-ALA FLUORESCENCE IN BRAIN METASTASES OF VARIOUS PRIMARY TUMORS: A MULTICENTER STUDY WITH EXPERIENCE IN 157 CASES**

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**INTRODUCTION:** Local recurrence of brain metastases following incomplete resection is not uncommon. One reason is insufficient intraoperative visualization of tumor tissue. Recently, visible intraoperative 5-aminolevulinic acid (5-ALA) fluorescence was reported in the first brain metastases series. Thus, the aim of this study was to investigate intraoperative 5-ALA fluorescence in brain metastases at two specialized centers in the largest patient cohort up to date. **METHODS:** 5-ALA was administered prior to resection of 157 brain metastases in 154 patients. Intraoperatively, the fluorescence quality (strong, vague or none) and fluorescence homogeneity (homogeneous or heterogeneous) of each brain metastasis was investigated. These 5-ALA fluorescence characteristics were correlated with primary tumor and histopathological subtype according to the current World Health Organization (WHO) 2016 criteria. **RESULTS:** Visible 5-ALA fluorescence was observed in 104 brain metastases (66%), whereas fluorescence was absent in the remaining 53 cases (34%). 53/104 (51%) brain metastases showed strong fluorescence and 51/104 (49%) vague fluorescence. The majority of brain metastases (84%) demonstrated a heterogeneous fluorescence pattern. In context of primary tumor, visible fluorescence was less frequent in brain metastases of melanomas compared to all other tumors (p=0.037). Moreover, visible fluorescence was more common for ductal breast cancer subtype than other subtypes (p=0.008). **CONCLUSION:** Our data indicate that 5-ALA fluorescence is a valuable for intraoperative visualization of brain metastases to improve the extent of resection and thus patient prognosis. However, the frequent heterogeneous 5-ALA fluorescence pattern and lack of strong fluorescence limits the use of 5-ALA in brain metastases, claiming for further technical refinement.