NIMG-43. GLIOMA PATIENT OUTCOME AND TUMOR BIOLOGY CORRELATE WITH INTRAOPERATIVE MRI FLAIR AND T2 TUMOR VOLUMES COMPARED WITH IMMEDIATE AND 3 MONTH POSTOPERATIVE VOLUMES

Randy Jensen
cantly change from baseline mean rKr(10.243 to 11.16, p=0.73) or mean rVp (3.72 to 3.42, p=0.51). Using median rVp and rKr as cut-offs, baseline rVp and rKr were not associated with PFS (2.7 vs 2.3 months, p=0.32, 2.6 vs 1.2 months, p=0.42, respectively). Baseline rVp was not correlated with OS, but baseline rKr was (5.1 vs 9.6 months, p=0.05). CONCLUSION: In this small group of patients, outcomes were poor with the exception of one patient. Although perfusion parameters may be affected by bevaciuzumab, our results suggest baseline rKr and rVp may correlate with OS. Further investigation in a larger cohort is necessary to examine potential predictive value of DCE-MRI in OS and PFS in patients treated with immunotherapy with or without bevacizumab.

NIMG-41. ACCURATE AND GENERALIZABLE PRE-OPERATIVE PROGNOSTIC STRATIFICATION OF GLIOBLASTOMA PATIENTS USING INTEGRATIVE QUANTITATIVE RADIOMIC ANALYSIS OF CONVENTIONAL MRI

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Abstracts

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IN CHILDREN AND ADOLESCENTS

NIMG-42. EXPERIENCE WITH generalization across multiple clinics.

F-FET PET/CT has demonstrated superior performance (ACC:89.11%), also supported by Cox degradation to 75.74% when using C-mpMRI. The A-FP/C-mpMRI model published model (S-FP/A-mpMRI) was replicated (ACC:78.71%), and using a 5-fold cross-validation scheme. The performance of the previously long-(>14months), and intermediate-survivors was quantitatively evaluated

mented into various sub-regions (e.g., enhancing/non-enhancing/necrotic).

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ated equal contribution

may be constructed pre-operatively using integrative radiomic analysis of

most patients. This study demonstrates that accurate prognostic models may be constructed pre-operatively using integrative radiomic analysis of widely-available C-mpMRI. We hypothesized that appropriate extraction and selection of advanced radiomic feature panels can potentially compen-

sate for the lack of A-mpMRI, thereby rendering such radiomic predictors more amenable to broad clinical use. A retrospective cohort of 101 de novo glioblastoma patients with preoperative C-mpMRI and A-mpMRI was seg-

mented into various sub-regions (e.g., enhancing/non-enhancing/ necrotic).

Both visually (e.g., same, location, intensity, etc.) and non- visually (e.g., tumor growth model parameters) interpretable radiomic features (n=1612) were extracted for these sub-regions. We assessed two feature configurations: our advanced feature panel (A-FP), and a subset feature panel (S-FP) based on an existing published prognostic A-mpMRI model. The classification accuracy (ACC) of the prognostic model configurations to classify short (<12 months), long-(>14 months), and intermediate-survivors was quantitatively evaluated using a 5-fold cross-validation scheme. The performance of the previously published model (S-FP/A-mpMRI) was replaced (ACC:77%1), and degraded to 75.74% when using C-mpMRI. The A-FP/C-mpMRI model demonstrated superior performance (ACC:89.11%), also supported by Cox regression (HR:2.84, 95%CI:2.42-3.34). These results suggest that accurate pre-operative prognostic stratification, which is important for personalized management. However, most patients typically undergo only conventional multiparametric magnetic resonance imaging (A-mpMRI). If successfully extended into various sub-regions (e.g., enhancing/non-enhancing/necrotic).

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Multimodal MRI: 80%/80%/90%. PET/MRI: 73%/100%/86%. CONCLUSIONS. The addition of 

F-FET PET to MRI for imaging of pediatric CNS-tumors has a major impact on the clinical management in 9% of all scans and in 85% in clinically indicated scans. The addition of F-FET PET for early postoperative imaging seems to increase the specificity for residual tumor and should be considered when radiation therapy is of high priority, especially if MRI is equivocal.

NIMG-43. GLIOMA PATIENT OUTCOME AND TUMOR BIOLOGY CORRELATE WITH INTRAOPERATIVE MRI FLAIR AND T2 TUMOR VOLUMES COMPARED WITH IMMEDIATE AND 3 MONTH POSTOPERATIVE VOLUMES

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INTRODUCTION: Intraoperative MRI is a useful tool in the operative management of human gliomas. T2 and FLAIR signals are often used as resection margins. We hypothesized that intraoperatively obtained MRI T2 and FLAIR signal volumes might not reflect corresponding post-oper-

ative volumes due to tumor edema after resection and brain manipulation.

METHODS: We examined 160 patients, average age 48.0 (range 16-82) 71 females and 89 males, who underwent intraoperative imaging during glioma surgery. We excluded patients with a new vascular injury identified on diffusion-weighted imaging. Volumetric assessment of T2 and FLAIR sig-

nals were interpreted independently of each other. We compared F-FET PET scans conducted primarily 72 hours after surgery, minor impact was seen in 42% and major impact in 4% of cases. Based on a consensus reading for residual tumor of follow-up scans (up to 24 months), we found the following lesion-based sensitivity/specifity/accuracy for diagnosis residual tumor: MRI alone: 80%/64%/72%. PET/MRI: 73%/100%/86%. CONCLUSIONS. The addition of F-FET PET to MRI for imaging of pediatric CNS-tumors has a major impact on the clinical management in 9% of all scans and in 85% in clinically indicated scans. The addition of F-FET PET for early postoperative imaging seems to increase the specificity for residual tumor and should be considered when radiation therapy is of high priority, especially if MRI is equivocal.

NIMG-44. ROLE OF PRE-TREATMENT TUMOR DYNAMICS AND IMAGING RESPONSE IN DISCRIMINATING GLIOBLASTOMA SURVIVAL FOLLOWING GAMMA KNIFE

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INTRODUCTION: Glioblastoma (GBM) is a notoriously deadly cancer with poor prognosis following tumor progression. Stereotactic radiosurgery (SRS) is advantageous for localized treatment of new tumor burden thus controlling cumulative radiation dose to normal tissue. However, post-treatment effect and tumor progression are difficult to decipher due to