combining baseline MATV and early mR allowed to identify three risk groups for OS and PFS respectively with different median OS/PFS in the development (12.1 vs 6.7 vs 3.8 months for the low, intermediate and high-risk groups; p<0.001 for OS and 4.9 vs 2.9 vs 1.3 months; p<0.001 for PFS) and validation cohorts (40 vs 25.3 vs 15.7 months; p<0.001 for OS and 15.3 vs 10.6 vs 7.7 months; p<0.001 for PFS). **Conclusion:** This study demonstrates the robustness of combined baseline MATV and early mR as prognostic biomarkers for OS/PFS in mCRC, independently of patients' treatment. As independent predictors of outcome, combining these biomarkers allowed to improve risk stratification for OS and PFS in both the development and validation cohorts. **References:** None.

## OP-576

### Multimodal Radiomic Imaging: Evaluation of $^{18}$F-FDG-PET and CE-CT as an early Imaging Biomarker for Prognostication and Response Prediction after Radiochemotherapy using Cetuximab in Head and Neck Squamous Cell Carcinoma

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**Aim/Introduction:** This study investigated the value of F-18-Fluorodeoxyglucose-positron-emission-tomography (PET) radiomics in comparison to contrast-enhanced-computed-tomography (CE-CT) radiomics in a) evaluation of progression free survival after radio-chemo-therapy, and b) identifying patients who will be free of recurrence of head and neck squamous cell carcinoma (HNSCC) as early as one week after end of radiochemotherapy. **Materials and Methods:** Following Institutional Ethics Committee approval and informed consent, a total of 59 patients with histologically proven and locoregionally advanced HNSCC were prospectively enrolled in this single-center randomized study, and scheduled for curative radiochemotherapy including cetuximab and cisplatin. PET and CE-CT were acquired on the same machine. Patients underwent PET/CE-CT imaging at 3 time points: pre-treatment (PET/CE-CT1), 1 week post primary radiochemotherapy (PET/CE-CT2) and 3 months post primary radiochemotherapy (PET/CE-CT3). 154 radiomic features of first, second, and higher order, glucose uptake (SUVmax), and Hounsfield units (HU) were extracted from the primary tumor at each time point separately. Delta radiomics/values ([posttreatment feature value – pretreatment feature value]/pretreatment feature value) following treatment were calculated for each parameter (PET2, CE-CT2, PET3, CE-CT3). Association of features to non-/recurrence, progression free survival (PFS), and between the different modalities was evaluated (Spearman's Rho "ρ"). A p-value of <0.05 was considered statistically significant. **Results:** 38 patients were free of recurrence during follow-up period (52+/-22 month; range 8-89). PFS was 38+/-26 month (range 2-83). There was no significant correlation between patients with/without recurrence, and SUVmax (p=0.17, 0.65, 0.94) or HUmean (p=0.17, 0.40, 0.05) at the 3 imaging time points. None of the PET/CE-CT1, but delta radiomics of 4 PET2 (0.02<p<0.04), 1 CE-CT2 (p=0.03), 9 PET3 (0.001<p<0.02), and 6 CE-CT3 (0.01<p<0.04) features could significantly predict the development of a recurrence. SUVmax and HUmean at 3 imaging time points were not significantly correlated to PFS (ρ=-0.25,-0.06,-0.11 for SUVmax and ρ=0.10,-0.07,-0.27 for HUmean). Pre-treatment values and proportional differences of selected significant radiomic features showed weak (PET1: -0.29<ρ<0.32; CT1: -0.31<ρ<0.30), weak to moderate (PET2: -0.44<ρ<0.39; CT2: -0.38<ρ<0.26), and moderate (PET3: -0.47<ρ<0.60; CT3: -0.36<ρ<0.38) correlation to PFS. Comparison of respective radiomic features between PET and CE-CT showed weak to moderate correlation at 3 imaging time points (0.24<ρ<0.76, -0.05<ρ<0.55, -0.02<ρ<0.39). **Conclusion:** Radiomics in a multimodality approach might be a complementary tool for response prediction and prognostication of patients with HNSCC as early as 1 week after primary radiochemotherapy. **References:** None.

## OP-577

### Prediction Of Therapeutic Response And Long-term Outcomes By EORTC Criteria And Percist In Breast Cancer Following Two Courses Of Neoadjuvant Chemotherapy

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**Aim/Introduction:** To investigate the predictive value of $^{18}$F-FDG PET/CT for pathological response and disease recurrence in breast cancer patients during neoadjuvant chemotherapy (NAC). **Materials and Methods:** Consecutive PET/CT scans in 128 operable breast cancer female patients at baseline and after two courses of NAC were retrospectively analyzed using the European Organization for Research and Treatment of Cancer (EORTC) criteria and Positron Emission Tomography Response Criteria in Solid Tumors (PERCIST). The concordance between these criteria was determined using Cohen's κ coefficient. Metabolic changes between scans for predicting pathological complete response (pCR) were evaluated with diagnostic test and receiver operating characteristic (ROC) analysis. Molecular subtypes were taken into consideration in the analysis. Kaplan-Meier plots and Cox regression analysis for the correlation with progression-free survival (PFS) were performed. **Results:**