Predicting Mutation Status and Recurrence Free Survival in Non-Small Cell Lung Cancer: A Hierarchical CT Radiomics – Deep Learning Approach

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Non-Small Cell Lung Cancer (NSCLC) is the world's leading cause of cancer deaths. A significant portion of these patients develop recurrence despite curative resection. Prognostic modeling of recurrence free survival in NSCLC has been attempted using computed tomography (CT) imaging features. Radiomic features have also been used to identify mutation subtypes in various cancers, however, the implications of such features on eventual patient outcome are unclear. Studies have shown that genetic mutation subtypes in lung cancers (KRAS and EGFR) have imaging correlates that can be detected using radiomic features from CT scans. In this study, we provide a degree of interpretability to quantitative imaging features predictive of mutation status by demonstrating their association with recurrence free survival using a hierarchical CT radiomics – deep learning pipeline.

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