IMAGING CHARACTERISTICS ASSOCIATED WITH DRIVER MUTATIONS IN PATIENTS WITH NON-SMALL-CELL LUNG CANCER

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Aim: The purpose of this study is to better identify imaging characteristics on computed tomography (CT) in patients with non-small-cell lung carcinoma (NSCLC) with known epidermal growth factor receptor (EGFR) mutations, KRAS mutations, and anaplastic lymphoma kinase (ALK) gene rearrangements.

Methods: Two hundred fifty-seven patients with a diagnosis of NSCLC and EGFR mutations, KRAS mutations or ALK gene rearrangements were assessed. We retrospectively analyzed the CT characteristics of each cohort.

Results: We evaluated 257 patients with NSCLC. One hundred fifty-three patients (59.5%) had EGFR mutations, 54 patients (21.0%) had KRAS mutations, and 50 (19.5%) had ALK gene rearrangements. All mutations were mutually exclusive. Most patients had stage III or IV disease. One hundred twenty-one cases were male, and 136 were female. The mean age was 62.1 years (range 29-89). Patients with EGFR mutations tend to have ground grass opacity (GGO), air bronchograms, and lung metastases (p<0.0001, p=0.0189, p=0.0028 respectively). Conversely, the lack of GGO components, air bronchograms, lung metastases, and pleural effusions is correlated with KRAS mutations (p=0.0084, p=0.0082, p=0.0016, and p=0.0052 respectively). Smaller size of tumor (<3cm), the lack of any GGO components, and the presence of lymphadenopathy, lymph nodes with extranodal invasion, lymphangitis and pleural effusions were significantly associated with the presence of ALK gene rearrangements (p=0.0166, p=0.0004, p=0.0074, p=0.0089, p=0.0266, p=0.0296 respectively).

Conclusions: These findings may help to make a proper diagnosis in the current era of molecular targeted therapies.

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