

Here, we analyze the dosimetric and patient-level characteristics associated with acute grade 2+ and 3+ esophagitis in patients undergoing radiation therapy for NSCLC across a statewide consortium.

Materials/Methods: Demographic, dosimetric, and acute toxicity data were prospectively collected for patients undergoing definitive radiation therapy +/- chemotherapy for stage II-III NSCLC from 2012-2022 across the Michigan Radiation Oncology Quality Consortium (MROQC). Logistic regression models were used to characterize the risk of grade 2+ and 3+ esophagitis as a function of dosimetric and clinical covariates. Multivariate regression models were fitted to predict the 50% risk of grade 2 esophagitis or 3% risk of grade 3 esophagitis at each dose value.

Results: Of 1760 patients evaluated, 84.2% had stage III disease and 85.3% received concurrent chemotherapy. 79.2% of patients had an ECOG performance status ≤ 1 . Rates of acute grade 2+ and 3+ esophagitis were 48.4% and 2.2%, respectively. On multivariate analyses, performance status, mean esophageal dose and esophageal D2cc were significantly associated with grade 2+ and 3+ esophagitis. Concurrent chemotherapy was associated with grade 2+ but not grade 3+ esophagitis. Dose-response relationships were modeled for grade 2+ and 3+ esophagitis by mean esophageal dose and esophageal D2cc, stratified by performance status and/or receipt of concurrent chemotherapy. For all patients, mean esophageal dose of 29 Gy and esophageal D2cc of 61 Gy corresponded to a 3% risk of acute grade 3+ esophagitis. For patients receiving chemotherapy, mean esophageal dose of 22 Gy and esophageal D2cc of 49.5 Gy corresponded to a 50% risk of acute grade 2+ esophagitis.

Conclusion: Performance status, concurrent chemotherapy, mean esophageal dose and esophageal D2cc are associated with acute esophagitis during definitive treatment of NSCLC. Models that quantitatively account for these factors can be useful in individualizing radiation plans. Mean esophageal dose of 29 Gy and esophageal D2cc of 61 Gy corresponded to a 3% risk of acute grade 3+ esophagitis and merit consideration as contemporary treatment planning constraints.

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2051

Dosimetric Predictors for Acute Esophagitis during Radiation Therapy for Lung Cancer: An Update of a Large Statewide Observational Study

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Purpose/Objective(s): Acute esophagitis remains a clinical challenge during the treatment of locally advanced non-small cell lung cancer (NSCLC).

2052

External Validation of the Graded Prognostic Assessment for Patients with Non-Small Cell Lung Cancer and Brain Metastases Using Molecular Markers (Lung-molGPA)

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Purpose/Objective(s): Patients with non-small cell lung cancer (NSCLC) and brain metastases represent a markedly heterogeneous population. The original diagnosis-specific graded prognostic assessment is a prognostic index based on data from patients diagnosed between 1985 and 2005 and includes patients age, performance status, extracranial disease, and number of brain metastases. An updated prognostic index (Lung-molGPA) that incorporates molecular features (EGFR and ALK alterations) was created in 2016 based on the North American retrospective database analysis of 2186 patients with NSCLC and newly diagnosed brain metastases between 2006 and 2014. The aim of this study is to validate the Lung-molGPA model in an independent Asian patient population.