Decreased Time to Treatment in Non-Small Cell Lung Cancer Improves Survival

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Introduction: Lung cancer is the leading cause of cancer-related mortality in men and women in the United States. Survival is directly correlated to stage, and stage can progress if cancer is left untreated. We hypothesize that expedited time to treatment after initial radiographic detection results in decreased mortality of local or locoregional non-small cell lung cancer (NSCLC).

Methods: We reviewed prospectively collected single institution data from patients with stage I-III NSCLC between 2009-2016. Interval between initial CT on which a suspicious lung nodule was detected (index CT), a subsequent biopsy date, and treatment start date (i.e., day of surgical resection or initiation of radiation therapy) was assessed. Follow-up data were obtained for overall (OS), and disease-free survival (DFS). Univariate analysis was used to investigate variables that correlated with OS and DFS. OS and DFS were compared between time groups using a log-rank test.

Results: Of 503 patients analyzed, 239 (47.5%) underwent surgical resection, 255 (50.7%) underwent radiation therapy, and 9 (1.8%) underwent both. Median follow-up was 5.2 years. Receiver operating characteristic (ROC) curves identified the optimum time to improve OS was ≤28 days from index CT to biopsy and ≤87 days from index CT to start of treatment. For stage I patients, a shorter time from index CT to biopsy was associated with improved OS, and DFS ($p<0.001$ and <0.001, respectively), as was a shorter time from index CT to treatment, (<0.001 and <0.001 respectively). No significant differences were found for stage II and III lung cancers.

Conclusions: Diagnosis within 28 days and treatment within 87 days after index CT resulted in improved OS and DFS for Stage I NSCLC. While treatment delays are often multifactorial in etiology, time to treatment must be addressed at the healthcare system level to improve outcomes for NSCLC.