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Protocol for Ground Glass Opacity

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Abstract

Rationale: Pure ground glass opacities (GGO), identified incidentally or on lung cancer screening, may indicate pre-invasive subtypes of lung adenocarcinoma. These neoplasms typically demonstrate indolent patterns of growth, and Fleischner Society guidelines recommend up to five years of serial imaging. Our aim was to determine the frequency of diagnosed lung adenocarcinoma arising from GGO detected beyond 5 years of CT surveillance.

Methods: We reviewed all pathologic diagnoses of lung adenocarcinoma (n=442) between 2016 and 2018 of a tertiary academic hospital and National Cancer Institute-designated cancer center to identify all cancers that arose from ground glass opacities detected on CT scan. Data extracted from the EMR included demographics, imaging characteristics and clinical outcomes.

Results: Of the 442 cases of lung adenocarcinoma, 32 (7%) were found that arose from pure GGOs and were ultimately diagnosed as cancer. Among the subgroup of GGOs, 74% (n=24) were diagnosed within the first five years of surveillance, but up to 26% (n=8) required between five and twelve years of serial follow up prior to definitive diagnosis. In order to detect 95% of cancers, GGOs would need to be followed for 7.9 to 12.7 years based upon a Kaplan-Meier estimate for time to diagnosis (p =0 .05). No patients who had lung adenocarcinoma arising from GGOs died (0/31) within a follow-up time of one to three years.

Conclusion: These data suggest that a greater number of lung adenocarcinomas would be detected upon routine follow up of GGOs that extended beyond the current recommendation of five years. Furthermore, the overall survival of the cohort was 100% (with one to three years of follow-up) consistent with existing data that these cancers are indolent. It is unknown whether a

higher detection rate would impact overall survival. More extended observation time and a prospective approach are required for confirmation of our findings.