Management of lung nodules that have the appearance of a ground glass opacity (GGO) on CT scan requires consideration of many potentially complex issues. This topic is extremely important for many reasons, both because the etiology of these nodules is often potentially deadly lung adenocarcinoma and because GGOs are being increasingly detected in many types of patients as the use of higher resolution CT scans are more frequently and routinely employed in patients. The lung cancers that have this appearance are generally less aggressive and behave in a more indolent fashion than lung cancers that have a solid appearance on imaging, but can eventually spread to lymph nodes and beyond if given enough time. Lung cancers with a GGO appearance also tend to be more common in women, non-smokers, and Asian patients and frequently harbor a genetic mutation in the epidermal growth factor receptor (EGFR) gene.

Many things can make management somewhat complex for these nodules, including the fact that they are often small and potentially difficult to biopsy to definitively demonstrate malignancy prior to treatment. Patients will also often have multifocal GGOs. Clinicians therefore must consider and treat these types of lung cancers somewhat differently than lung cancers that have a solid radiologic appearance in several ways. First, evidence is increasingly accumulating that these types of lung cancers do not require an anatomic lobectomy in all cases, which generally had been considered the gold standard lung cancer operation since a randomized trial from the Lung Cancer Study Group was published in the 1990s. Second, not all GGOs will necessarily progress from benign atypical adenomatous hyperplasia to either adenocarcinoma in situ or true invasive adenocarcinoma in a patient's lifetime and therefore actually require treatment.

Work up and evaluation of a GGO generally must be individualized to specific patients. The first management decision occurs upon initial nodule detection, and involves whether the nodules require more aggressive action at that time or if observation for progression prior to initiating any diagnostic or therapeutic interventions is more appropriate. When further intervention is deemed necessary, decisions regarding diagnostic and staging studies must be made. If treatment is required, the therapeutic options include resection or nonoperative management with stereotactic radiation or other ablative techniques such as cryotherapy or radiofrequency ablation. If surgery is pursued, options for the extent of surgery are wedge resection, segmentectomy, or lobectomy. When patients have multifocal synchronous GGOs, clinicians must decide which nodules require action and which can be observed. When nodules are observed, clinicians must have criteria for when progression requires action. Finally, clinicians must also decide on either adjuvant therapy or surveillance after treating a lung adenocarcinoma with a GGO appearance.

There are important subtleties to consider in all these management branches. This book is a themed collection of previously published articles that address these topics and will help surgeons navigate this potentially complex and more increasingly common clinical situation to optimally treat their patients. This resource will be valuable to not only thoracic surgeons, but all practitioners who take care of patients who are found to have a GGO. The ultimate beneficiary will be each patient whose care is individualized to optimize their long-term prognosis while limiting any potential morbidity of treatment.

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