



Selecting therapy for small ground-glass tumors—the potential role of volumetric computed tomography scan

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Shimada and colleagues have reported on the prognostic value of tumor solid-part size and solid-part volume in patients with clinical stage I non-small cell lung cancer (NSCLC) (1). In their study, the authors studied 252 patients with clinical stage I NSCLC that included a ground-glass component and used high-resolution computed tomography (CT) with 3D reconstruction for evaluation. The authors correlated 2D-data (including whole tumor size, solid part size) and 3D-data (including whole tumor volume and solid tumor volume) with outcomes. All patients underwent resection, so additional factors such as the relationship between radiological features and pathological outcomes including lymphovascular invasion or nodal upstaging could be evaluated.

Most early stage NSCLC found by HRCT in Asia present as pure Ground Glass nodules (pGGO) or part solid (subsolid) nodules (mGGO). Malignant NSCLC presenting as GGO are generally regarded as low-grade malignancies (2). Some studies have demonstrated that the outcome after pulmonary resection or stereotactic body radiotherapy is related to the solid component of the nodule (2-5). Additionally, TNM staging is not as helpful for predicting behavior of pGGO and mGGO. In this paper Shimada *et al.* have demonstrated that the solid-part size (with a cut-off value of 2.03 cm), the solid-part volume (with a cut-off value of 1.889 mm³) and the integrated use of solid-part size and solid-part volume are associated with, overall survival, disease-free survival and predicting poor

prognostic factors such as nodal upstaging. Further studies, using other datasets will be required to confirm these findings.

There are some limitations and concerns to this study. This includes that the authors recently published a paper utilizing a similar analysis within the last year (6). The primary difference seems to be that the patient population in their earlier study was restricted to patients with c1a tumors. I suspect that there is overlap in the patient population. Currently 3D image conversion is not routinely performed, and it is unclear whether similar results would be obtained using other systems different from the Synapse Vincent system that was used in this study. The authors mention that the evaluation of the 2D and 3D scans required consensus by at least 3 physicians suggesting that there is some variability in interpretation. This again argues for further validation using volumetric CT and 3D reconstruction by other investigators. With these limitations in mind, this approach has potentially great value in helping direct physicians between selecting operations such as lobar or sublobar resection, and between resection and non-operative therapies such as stereotactic body radiation therapy when treating patients with ground-glass early stage lung cancer.

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Footnote

Conflicts of Interest: The authors have no conflicts of interest to declare.

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