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IS PARAMETER T STAGING INFLUENCED BY TUMOR BEHAVIOR?

To the Editor:

We read with interest the article by Hattori and colleagues¹ about the prognostic value of the ground glass opacity (GGO) component on prognosis and its effect on parameter T in non–small cell lung cancer staging. This is an extremely current and meaningful topic. In an extension of their previous article in 2016,² the authors did a good job, and the article is well designed and written. Its central message is that if a nodule presents with a partial GGO feature, survival will be different from the same T stage pure solid tumor in early non–small cell lung cancer (N0, M0). In the last 5 years, different studies have warned thoracic surgeons that in case of subsolid tumors, the prognosis was not determined by the whole tumor size, supporting the idea that parameter T should be downstaged in accordance with the solid part size exclusively. In 2015, this criterion was accepted in the 8th TNM classification edition. Hattori and colleagues¹ introduce new advice that GGO presence could improve the prognosis in itself. This proposal is innovative because it basically introduces tumor behavior in parameter T assessment, in contrast with usual criteria based on tumor dimension and parenchyma position. A possible explanation to their findings is the different natural genetic history between tumors with and without the GGO component.

With a focus on clinical daily practice, this novel factor in preoperative T staging could influence decision making in pulmonary resection extension (wedge resection vs segmentectomy vs lobectomy). Indeed, it has been accepted that pure GGO deserves nonanatomic resection without nodal dissection, whereas pure solid tumors require lobectomy when feasible.³ Now the question is if even partial solid nodules could spare lobectomy and lymphadenectomy based on the GGO component presence. In our opinion, this is an important topic because

GGOs are often multiple and bilateral. Therefore, the possibility to save pulmonary parenchyma by segmentectomy, instead of lobectomy, should allow the patient to undergo further future resections in case of consolidation or increase in size of the other nodules.

We congratulate Hattori and colleagues¹ for their outstanding article and encourage them to continue their studies on GGO management.

Alessandro Baisi, MD^a

Federico Raveglia, MD^a

Ugo Cioffi, MD, PhD^b

^aThoracic Surgery Unit

Azienda Ospedaliera San Paolo

^bDepartment of Surgery

University of Milan, Milan, Italy

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<https://doi.org/10.1016/j.jtcvs.2017.12.116>

NEW ERA DEFINING A NOVEL CLINICAL T STAGING IN NON–SMALL CELL LUNG CANCER

Reply to the Editor:

We are grateful for the letter of Baisi et al¹ regarding our recent study in the *Journal*.²

In that article, we focused on the prognostic value of the ground glass opacity (GGO) component and its effect on clinical T classification in non–small cell lung cancer (NSCLC) staging. Our results suggest that simple presence of a GGO component has the ability to distinguish survival differences even for the same clinical T stage in early-stage NSCLC. In other words, clinicopathologic and oncologic outcomes are disparate between part-solid and pure-solid tumors on the basis of a GGO presence in the same clinical T category of the eighth edition of the American Joint Commission on Cancer TNM staging system.

Recently, many thoracic surgeons revealed that consolidation tumor ratio, or solid component size on thin-section computed tomography, has been considered more prognostic than maximum tumor size for NSCLC. This finding was extremely important in the history of

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general thoracic surgery. On the basis of these results, the eighth edition of the American Joint Commission on Cancer TNM staging system drastically changed the staging system, with clinical T category being determined according to the invasive or solid component size, excluding a GGO. Presence of a GGO denotes a great influence on the favorable prognosis of NSCLC, however, and a radiologically solid component per se may not be considered in the prediction of long-term survival in NSCLC provided that tumors show a GGO component, which would be due to the prevalence of less-invasive or lepidic-predominant adenocarcinoma in the population.^{2,3} On the other hand, our daily practice clearly demonstrates a new issue that radiologically determined pure-solid lung cancers without a GGO component exhibit more malignant behavior and show several histologic types that have a poorer prognosis than do radiologically part-solid lung cancers.^{2,3} One cannot distinguish a radiologically part-solid tumor from a pure-solid one without a GGO component in the recent T staging, however, because both will lie in the same clinical T category if they present the same solid component size. This creates a potential risk of stage migration in this situation.²

Through a lot of transitions for the clinical T descriptor in lung cancer staging based on the copious research regarding radiologic and pathologic correlations and its oncologic prognosis, we should reach a new era defining the novel T parameter according to the tumor behavior. We believe that recognition of the presence of a GGO on thin-section computed tomography would be suitable for the new clinical T parameter, and radical compared with the measurement of a solid component to evaluate the radiologic-pathologic correlation and the prognosis. Further research would be required for external validation; however, a thorough distinction based on the presence of a GGO component is important when considering the clinicopathologic characteristics or oncologic outcomes of clinically node-negative early-stage lung cancers.

Our findings may also influence decisions as to the appropriate operative modes for small-sized lung cancer in the future. Tumors with a radiologically noninvasive appearance, including c-Tis and c-T1mi lesions, are candidates for limited surgical resection, including wedge resection or segmentectomy. In contrast, major lung resection with mediastinal lymph node dissection is warranted for radiologically invasive lung cancers. Currently, the efficacy of pulmonary segmentectomy is being prospectively evaluated for small-sized part-solid or pure-solid tumors ($0.5 \leq$ consolidation tumor ratio ≤ 1.0)

in Japan (JCOG 0802 study). Enrollment has been accomplished, and the study is under observation. The study, however demonstrates that segmentectomy is not always a “less invasive” procedure than lobectomy from the viewpoint of surgical morbidity.⁴ We should await the final results of the JCOG 0802 study to conclude appropriate operative modes for radiologically invasive NSCLC 2 cm or smaller. In our recent article, however, it is certain that the oncologic outcome of sublobar resection was significantly worse than that of lobectomy when the tumor showed a radiologically pure-solid appearance (consolidation tumor ratio = 1.0).⁵ This speculation may require further investigation, but segmentectomy should be applied with great caution, especially for radiologically pure-solid tumors because of their highly invasive nature. In the future, focusing on the presence of a GGO component would provide a promising and innovative method for deciding on appropriate operative modes for small-sized NSCLCs.

The principle behind the TNM staging system is the classification of cancers into groups according to the anatomic extent to give some indication of the cancer prognosis, which greatly contributes to the selection of an appropriate surgical strategy. Lung cancer staging is developing even now, and we are entering a new era in which lung cancer staging would be based on the important parameter that demonstrates tumor behavior, presence of a GGO component. Proper indication of sublobar resection for small-sized lung cancers is still controversial in recent general thoracic surgery; we hope, however, that our study could provide a clue for more refined cancer staging and treatment strategies for early-stage NSCLC.

Aritoshi Hattori, MD

Kenji Suzuki, MD

Department of General Thoracic Surgery
Juntendo University School of Medicine
Tokyo, Japan

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