Thymic epithelial tumors are an uncommon group of diseases with a broad range of clinical outcomes. Although considerable progress has been made in the management of thoracic malignancies, little has changed for early and intermediate stage thymic tumors. For patients with early stage disease, long-term disease-free survival for thymoma is exceptionally good, approximating 80% at 10 years.\(^1\) Taken a step further, investigation of the incidence and outcomes for patients with thymic tumors is into accurate and timely detection and management quality. In this issue of the *Journal of Thoracic Oncology*, Shin et al.\(^2\) present a well-analyzed series of thymic tumors using the Korean Central Cancer Registry (KCCR). Similar analyses have been previously published in predominantly western populations, and a large analysis using the Surveillance, Epidemiology, and End Results program data set had revealed the highest incidence of thymoma in persons identifying as Asian or Pacific Islander.\(^3\) The series presented is timely in this sense, as the incidence and outcomes are evaluated in an Asian population. Similar to other large national cancer registries, the KCCR captures dates of diagnosis, stage, and therapies administered. In addition, the authors’ follow-up includes mortality data that provide additional clarity as to the long-term disease-specific outcomes (cancer-specific death). The completeness of the case capture for this specific data set is impressive, predicted at more than 98% of all malignancies.

In the current study, the authors reported an age-standardized incidence rate of 0.50 in the study population as compared with 0.23 to 0.30 per 100,000 in the United States (Surveillance, Epidemiology, and End Results) and 0.17 in a European data set. The authors rightly suggest that the results can lead us toward two potential conclusions, either: (1) the increasing incidence of thymic lesions in the study population represents a true increase in the development of the disease or (2) the increased accessibility of imaging is allowing for more lesions to be identified. On the basis of the data presented, the latter seems to be more likely with respect to thymoma. The proportion of early stage thymoma increased in the study period from 36.4% to 49.9%, whereas that of the late stage decreased nearly an equivalent amount in the same time period, 19.4% to 8.8%. This stage shift observation is further supported when looking at the incidence and survival by WHO histologic subtype. The incidence of A, AB, and B1 thymomas increased at a faster rate and was more likely to be at an early stage, as compared with that of B2 and B3. Similarly, the survival gains found in the A, AB, and B1 subtypes were not found for the B2 and B3 groups. Collectively, this information raises interest and anticipation for other trends that may be observed from other focused thymic disease databases using the International Thymic Malignancy Interest Group registry template, including the Korean Association for Thoracic Surgical Oncology.\(^4\)

As the authors comment, there is a paucity of robust or firm data to support the findings as being strictly related to the high utilization of diagnostic imaging in the study population. Nonetheless, certain conclusions can be drawn, which can affect clinical practice. The increase in survival coupled with the increase in incidence of A, AB, and B1 histopathologic groups would suggest that early intervention on these patients, despite an often relatively indolent disease course, is appropriate. Conversely, the more modest improvement in survival of thymic carcinoma would perhaps suggest an alternative conclusion. Given the marginal improvement in survival outcomes, the absolute increase may be due to more than simply an increased penetrance of diagnostic imaging. Whether earlier detection improves outcomes is less clear in this thymic carcinoma subset. Rather, and perhaps more likely, improved outcomes leading to
considerable survival benefits may be associated with the inclusion of better systemic therapy combined with early detection. By virtue of resected thymic carcinomas being included in the KCCR, there is the tacit intimation of an absolute benefit to surgical resection. As such and for the time being, surgical resection seems as though it should remain a fundamental pillar of therapy for thymic carcinomas as it is for thymomas. As more data emerge from Asia, and from Korea, in particular owing to the increased exposure to radiation, the role of other therapies in thymic carcinoma most certainly will become better supported by high-quality evidence. In fact, the association between radiation exposure and thymic carcinoma may become a byproduct that moves to the forefront as well.

Although difficult to tease out, the value of widely available health care imaging as compared with the risk, albeit small for each individual patient, of development of malignancy or complications from a diagnostic procedure remains unclear. Lung cancer screening has been found to improve outcomes for patients with primary NSCLC, but most lesions identified are not malignancies. The consequence of this fact is that there is an increase in invasive diagnostic procedures and noninvasive follow-up imaging. Taking into consideration that there are trade-offs associated with any screening strategy, does the potential improvement in survival secondary to increased utilization of imaging warrant consideration for elective screening for thymic lesions? This is likely a bridge too far as the identification of a cohort with clearly defined risk factors for disease, including a detectable diagnoses with outcomes affected by early intervention, is not yet supported. Alternatively, the ability to identify off-target diagnoses under the umbrella of screening for another malignancy (i.e., lung cancer) is a potential contributor to a survival benefit. Perhaps this phenomenon is less representative of securing two birds with one stone and more akin to the blind squirrel finding a nut on occasion. Last, the authors provide data that should be the impetus for further studies to identify whether there are in fact true risk factors unrelated to the frequency of imaging, which contributes to the increased incidence of thymic lesions found in the study population as compared with similar study population of western origin. If unique diseasespecific risk factors can be identified, then selective screening for certain high-risk patients may have a considerable impact on risk modifications or interventions that can influence outcomes, thereby justifying its role in thymic diseases. Further investigations into unique targetable genetic or epigenetic alterations may also provide insight into the potential differential incidence in the Korean population and potentially to the international community at large.

CRediT Authorship Contribution Statement

Scott M. Atay, Anthony W. Kim: Conceptualization, Investigation, Methodology, Project administration, Resources, Supervision, Validation, Visualization, Roles/Writing - original draft, Writing - review & editing.

References