work should aim to understand the pathophysiology of this association, confirm the authors' findings in additional data-sets, and delineate cutoff values useful to guide clinical care such as invasive testing.

See Article page 1521.

Commentary: Comparing apples to oranges can bear fruit

Jonathan C. Nesbitt, MD

Pulmonary hypertension (PH) is a recognized risk factor for perioperative morbidity and mortality. Select patients with PH can safely undergo pulmonary resection, but they remain at increased risk for postoperative complications.¹

For patients being evaluated for pulmonary resection, considerations of risk determination include lung function (mechanics and physiology), exercise tolerance, and cardiac status (inherent disease and performance). The presence of PH is not commonly investigated and can occur in the absence of advanced pulmonary dysfunction or hypoxemia. The diagnosis of PH requires a high degree of suspicion and is established by hemodynamic measurements, most accurately during right-sided heart catheterization. Echocardiography is frequently used as a less invasive test, but it is limited in scope and accuracy.

Chest computed tomography (CT) is accepted as a fundamental study during preoperative assessment of patients undergoing pulmonary resection to assess the primary lesion and extent of disease. In radiologic interpretations of chest CT scans, the size of the pulmonary artery (PA) or comparative PA-to-aorta size (PA:Ao ratio) is not routinely reported. Yet the PA:Ao ratio or the PA size itself has been recognized as a surrogate indicator of PH. In addition, the

From the Vanderbilt Thoracic Surgery, Vanderbilt University Medical Center, Nashville, Tenn.

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Address for reprints: Jonathan C Nesbitt, MD, Thoracic Surgery, Vanderbilt University Medical Center, Suite 609, Oxford House, 1313 21st Ave South, Nashville, TN 37232 (E-mail: jon.nesbitt@vumc.org).

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Jonathan C. Nesbitt, MD

CENTRAL MESSAGE

Pulmonary artery enlargement based on preoperative computed tomography assessment may be associated with increased major operative risk and should alert the surgeon to possible underlying pulmonary hypertension.

PA:Ao ratio has been shown to be an accurate predictor of PH in patients with idiopathic pulmonary fibrosis and chronic obstructive pulmonary disease. Asakura and colleagues² used the PA:Ao ratio to determine outcomes and identified a PA:Ao ratio >1.0 as an independent predictor of postoperative complications following pulmonary resection for lung cancer.

In this issue of the *Journal*, Kneuert and colleagues³ discuss their findings that PA size on preoperative chest CT is associated with increased risk of complications after lobectomy. Their well-conducted study on a large population from a single institution showed that comparative enlargement of same-side surgery PA diameter (ssPAD) was associated with increased major morbidity after lobectomy, independent of other known cardiopulmonary risk

factors. PA pressure was not measured in the study, but the inference is that PA enlargement occurred as a consequence of underlying, undefined PH. Major complications increased with larger ssPADs and ranged from 8.3% for patients with ssPAD <20 mm to 17.3% for patients with ssPAD $\geq$ 25 mm.

Their review raises important questions that require more in-depth study: What PA size or PA:Ao ratio should trigger further assessment by echocardiography or right heart catheterization? What specific PA (main, right, left) diameters and pressures are independent variables of low, moderate, and high risk? What patients with PH can undergo lobectomy, and how can these patients be optimally managed perioperatively?

I commend Kneuert and colleagues for their work. These results provide further evidence of PH-associated

morbidity in pulmonary surgery and highlight an underused and simple screening tool for identifying patients at potential operative risk. Surgeons should consider CT-directed PA measurements more often in their decision making process. Comparing apples to oranges can indeed bear fruit.

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Check for updates

Commentary: Measures of relevance from relevant measurements: Pulmonary artery size on computed tomography as predictor of postlobectomy complications

Marcelo Cerullo, MD, MPH

Outside of revolutionary developments in treatment paradigms, improvements in surgical outcomes stem from 3 domains. First, there are incremental steps conferred by experience (of surgeons, perioperative teams, and

Marcelo Cerullo, MD, MPH

CENTRAL MESSAGE

Pulmonary artery luminal diameter is a potential factor in preoperative risk stratification for patients undergoing lobectomy for lung cancer.

From the Department of Surgery, Duke University; and National Clinician Scholars Program, Duke University and Durham Veterans Affairs Medical Center, Durham, NC. Disclosures: The author reported no conflicts of interest.

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Address for reprints: Marcelo Cerullo, MD, MPH, Duke University General Surgery Residency, Duke University Medical Center, Room 3589, Duke South, Durham, NC 27710 (E-mail: marcelo.cerullo@duke.edu).

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institutions) that accrue over time.¹ Second, there are small but significant advances made via the widespread adoption of “best practices” (which includes preoperative optimization and appropriate adjunctive therapies).² Third, and most subtly, is the gains from accurate risk-stratification and patient selection.^{3,4} It is in this last domain that Kneuert and colleagues⁵ highlight a particular opportunity for thoracic surgeons treating patients with lung cancer.