Don't look now! Risk stratify first

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Disclosures: Author has nothing to disclose with regard to commercial support.

Received for publication March 30, 2016; accepted for publication March 31, 2016; available ahead of print April 28, 2016.

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J Thorac Cardiovasc Surg 2016;152:533-4

0022-5223/\$36.00

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<http://dx.doi.org/10.1016/j.jtcvs.2016.03.063>

Postoperative venous thromboembolism (VTE) after lung resection increases mortality nearly 8-fold,¹ with the risk persisting for longer than 30 days.² As exemplified by the central picture in the article by Raja and colleagues³ in this issue of *The Journal*, a VTE after a pneumonectomy decreases long-term survival for as long as 2.5 years. New strategies are necessary to identify patients who are at increased risk for perioperative VTE after anatomic lung resections. These patients at higher risk may benefit from preventive measures, such as extended anticoagulation prophylaxis after discharge. The Caprini VTE risk assessment model is an individualized screening tool that has been evaluated in multiple specialties and more recently in my own group's retrospective cohort of patients undergoing lung resection for malignancy, in which the VTE incidence increased with Caprini score.⁴

In their article, Raja and colleagues³ report an 8.9% rate of VTE in 112 patients undergoing pneumonectomy who underwent routine postoperative lower extremity screening the day before hospital discharge. This corroborates the findings of Agzarian and associates,⁵ in which there was a

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Central Message

Venous thromboembolism increases lung resection mortality. Risk stratification identifies higher risk patients for prolonged prevention. Screen the high risk.

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12.1% 30-day VTE rate in patients undergoing anatomic lung resection who were screened not only with ultrasonography but also computed tomography pulmonary angiography. This leads to the “the more you look, the more you see” conclusion in this more recent publication. We can conclude that if VTE decreases long-term survival after pneumonectomies, then we should delineate an early detection and prevention pathway to decrease that

FIGURE 1. Proposed clinical application of the Caprini venous thromboembolism (VTE) risk assessment model throughout the preoperative, postoperative, and hospital discharge phases for patients undergoing lung resection. DVT, Deep vein thrombosis; IVC, inferior vena cava; LMWH, low-molecular weight heparin.

mortality. The concern about the article in which only screening was used to identify those who had VTE is that symptomatic VTE developed after discharge in an additional 3.6% of the patients undergoing pneumonectomy, despite negative results of ultrasonography! Screening alone is insufficient. Raja and colleagues³ conclude that routine screening or longer prophylaxis for VTE should be considered for identification and (presumably) prevention of VTE. But what else needs to be considered? There are risks and costs associated with such a broad plan. Screening and prolonged prevention cost money. Prolonged prevention may result in bleeding and patient discomfort.

What is the solution? Risk stratification for VTE prevention has been shown to identify those at risk for development of VTE after lung resection. In our preliminary stratification studies of all thoracic surgical patients, VTE rates were almost negated, with minimal associated risks.⁶ Raja and colleagues³ reported higher risks in the older patients with chronic obstructive pulmonary disease and those undergoing extrapleural pneumonectomies; thus they are already identifying some risk factors that are supported in the literature (age) and that may need to be included in a model more appropriate for thoracic surgical patients.

What about cost? The reported 60% reduction in postoperative VTEs with extended-course chemoprophylaxis could result in a significant decrease in health care costs associated with the diagnosis and treatment of VTE

complications, which can exceed \$15,000 per event, not including the additional costs of readmission.⁷

How can we improve VTE rates and postoperative mortality after lung resections? Risk stratification and consideration of incorporation of screening for the patients at higher risk (Figure 1). The more you look, the more you see—but sometimes you need to see the trees and not the forest.

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