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Commentary: Venous embolic events after lung resection: How does it affect prognosis? What are recommendations to prevent it?

Yaron Perry, MD, FACS

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CENTRAL MESSAGE

Long-term mortality and cancer-related mortality after lung surgery may be associated with thromboembolic events. This study documents that screening and treating it will not improve survival. Do we have enough evidence for this?

In their article in this issue of the *Journal*, Akhtar-Danesh and colleagues[1] present a study of an intervention involving routine venous thromboembolism (VTE) screening and subsequent treatment of postoperative thrombotic events, documenting that this intervention does not impact the long-term survival of lung cancer patients.

Thoracic surgeons always strive to improve the quality of their treatment and to achieve better outcomes for our patients. The detrimental effect of postoperative mortality, and cancer-related mortality at large, may be associated with the final consequence of a thromboembolic event, although it is probably more complex than that.

The balance between fibrinogen, tissue thromboplastin, and other clotting factors, as well as heparin and other fibrinolytic enzymes, may be genetically determined or potentially altered by paraneoplastic factors secreted by the tumor and the host immune system. VTEs, including pulmonary embolism and deep vein thrombosis, are potentially preventable complications of surgical interventions, yet remain important sources of morbidity in postsurgical cancer patients. Extended postdischarge prophylaxis has never been suggested or documented to have any advantage during the postoperative period in lung cancer patients after resection.

Some 20% of cancer patients are at increased risk for venous thromboembolic events.[2] The pathophysiology is related to cancer type, grade, metastases, chemotherapy, and surgical intervention.[3,4] The associated mortality rate among lung and esophageal cancer resection patients can reach 20% and 14%, respectively.[5,6]

A recent study in thoracic surgery patients undergoing esophagectomy for esophageal cancer or a lung resection for lung cancer has documented that implementation of the Caprini risk assessment model decreased symptomatic VTE, although the study did not document the effect on long-term survival.[7] There have been few studies that refer specifically to screening-detected VTEs specific to thoracic surgery.

This study by Akhtar-Danesh and colleagues is an observational pilot study with a small sample size. The findings suggest that the morbidity and mortality of postoperative VTEs lies in the short-term postoperative period, and that development of perioperative VTE might not impact long-term outcomes. To minimize the impact of VTEs on long-term survival, however, regular screening for high-risk patients may be warranted to promote early diagnosis and treatment to best avoid the long-term sequelae and complications of thrombotic events. Importantly, treated events are unlikely to impact long-term outcomes.

From the Division of Thoracic Surgery and Thoracic Oncology, Jacobs School of Medicine, University at Buffalo, State University of New York, Buffalo, NY.

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Address for reprints: Yaron Perry, MD, FACS, Division Chief of Thoracic Surgery and Thoracic Oncology, Jacobs School of Medicine and Biomedical Sciences, University at Buffalo, State University of New York, 100 High St, C-313, Buffalo, NY 14203 (E-mail: yperry@Buffalo.edu).

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This article leaves us with a mixed message and represents the difficulty of such a study, as well as the multivariable effects in play for a patient with thoracic malignancy.

It is difficult to support the need for long-term postoperative prophylaxis to prevent thromboembolic events in the absence of an indication such as arrhythmia, previous VTE, or documented deep vein thrombosis. Large screening studies that document deep vein thrombosis screenings before and after surgery in patients with thoracic malignancy may reveal further answers and have the potential to lead to future recommendations in practice. However, the cost-effectiveness as well as the possible side effects of anticoagulation in these patient populations must be weighed against the benefit of such a screening.

This work documents the need for a larger screening study of patients undergoing lung resection to evaluate the benefits of long-term thromboembolic prophylaxis treatment with the long-term effects on survival.

References

1. Akhtar-Danesh GG, Ben-Avi R, Agzarian J, Shargall Y. Is asymptomatic postoperative venous thromboembolism associated with long-term survival in patients undergoing lung resection for malignancy? *J Thorac Cardiovasc Surg Open*. 2021;4:241-5.
2. Blom JW, Doggen CJM, Osanto S, Rosendaal FR. Malignancies, prothrombotic mutations, and the risk of venous thrombosis. *JAMA*. 2005;293:715-22.
3. Tesselaar MET, Romijn FPH, Van Der Linden IK, Prins FA, Bertina RM, Osanto S. Microparticle-associated tissue factor activity: a link between cancer and thrombosis? *J Thromb Haemost*. 2007;5:520-7.
4. Qureshi W, Ali Z, Amjad W, Alirhayim Z, Farooq H, Qadir S, et al. Venous thromboembolism in cancer: an update of treatment and prevention in the era of newer anticoagulants. *Front Cardiovasc Med*. 2016;3:24.
5. Merkow RP, Bilimoria KY, McCarter MD, Cohen ME, Barnett CC, Raval MV, et al. Post-discharge venous thromboembolism after cancer surgery: extending the case for extended prophylaxis. *Ann Surg*. 2011; 254:131-7.
6. Trinh VQ, Karakiewicz PI, Sammon J, Sun M, Sukumar S, Gervais MK, et al. Venous thromboembolism after major cancer surgery: temporal trends and patterns of care. *JAMA Surg*. 2014;149:43-9.
7. Sterbling HM, Rosen AK, Hachey KJ, Vellanki NS, Hewes PD, Rao SR, et al. Caprini risk model decreases venous thromboembolism rates in thoracic surgery cancer patients. *Ann Thorac Surg*. 2018;105:879-85.