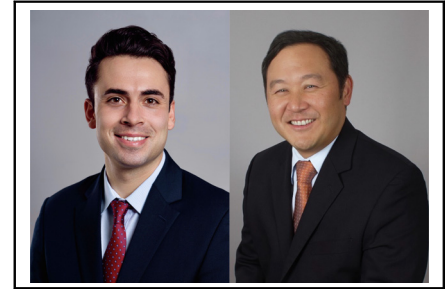


See Article page 1603.



## Commentary: Extended thromboembolism chemoprophylaxis for thoracic oncologic surgery: To discharge and beyond!

Omar Toubat, PhD, and Anthony W. Kim, MD



Omar Toubat, PhD, and Anthony W. Kim, MD

### CENTRAL MESSAGE

Thoracic surgeons should continue to explore new frontiers with extended-duration thromboembolism chemoprophylaxis to reduce postoperative venous thromboembolic complications.

Venous thromboembolic (VTE) events are a major complication following thoracic oncologic surgery and are associated with significant morbidity and mortality.<sup>1</sup> Despite current guidelines recommending the use of inpatient pharmacologic thromboprophylaxis with either unfractionated heparin or low-molecular-weight heparin,<sup>2</sup> studies have estimated that up to 15% of patients seeking surgical thoracic oncology care will develop a VTE complication postoperatively and nearly a quarter of these events are anticipated to occur after discharge.<sup>3</sup> Although these sobering statistics suggest that postdischarge pharmacologic thromboprophylaxis may provide additional reduction of VTE risk for patients undergoing thoracic surgery, studies evaluating the efficacy of extended thromboprophylaxis after lung cancer surgery are limited.<sup>4</sup>

Kho and colleagues<sup>5</sup> report a timely, well-designed analysis of their institutional outcomes following extended-duration pharmacologic thromboprophylaxis after resection of primary lung cancer. Using propensity-score matching techniques, they compared the incidence of pulmonary embolism (PE) and VTE events between 253 well-matched control patients receiving routine inpatient

thromboprophylaxis with dalteparin and treatment patients receiving an extended course to 28 days postoperatively. The authors report that extended chemoprophylaxis was associated with a significant reduction in the incidence of postoperative PE (4% control vs 0.4% treatment;  $P = .01$ ), but no statistically significant reduction in overall VTE events (4% control vs 1.2% treatment;  $P = .09$ ). Multivariate regression modeling supported the lower PE event rate observed in the treatment group, demonstrating that extended thromboprophylaxis was associated with a reduced incidence of postoperative PE after controlling for several pertinent demographic and clinical characteristics. Only 1 patient in the extended thromboprophylaxis group experienced a clinically significant upper gastrointestinal bleeding complication. Following endoscopic intervention, the patient was able to complete the extended dalteparin regimen without issue.

These results provide novel, sound evidence in support of the clear potential for extended pharmacologic thromboprophylaxis to further reduce the risk of VTE complications in patients undergoing thoracic surgery. However, as astutely stated by the authors, these findings should be interpreted within the limitations inherent to any retrospective analysis. Although propensity-score matching is a powerful statistical approach to minimize bias in retrospective data, the potential influence of unmeasured confounders on VTE

From the Division of Thoracic Surgery, Department of Surgery, Keck School of Medicine, University of Southern California, Los Angeles, Calif.

Dr Toubat is supported in part by National Institutes of Health, United States grant No. F30HL154324 outside of the submitted work.

Disclosures: The authors reported no conflicts of interest.

The *Journal* policy requires editors and reviewers to disclose conflicts of interest and to decline handling or reviewing manuscripts for which they may have a conflict of interest. The editors and reviewers of this article have no conflicts of interest.

Received for publication July 19, 2022; accepted for publication July 20, 2022; available ahead of print Aug 2, 2022.

Address for reprints: Anthony W. Kim, MD, Division of Thoracic Surgery, Department of Surgery, Keck School of Medicine, University of Southern California, 1510 San Pablo St, Suite 514, Los Angeles, CA 90033 (E-mail: [anthony.kim@med.usc.edu](mailto:anthony.kim@med.usc.edu)).

*J Thorac Cardiovasc Surg* 2022;164:1612-3  
0022-5223/\$36.00

Copyright © 2022 Published by Elsevier Inc. on behalf of The American Association for Thoracic Surgery

<https://doi.org/10.1016/j.jtcvs.2022.07.020>

outcomes should not be disregarded completely. This point is particularly relevant given the exceedingly low VTE event rate observed in this study (2.6% in the overall matched cohort). Given the study methodology of evaluating only clinically suspected events within the first 6 months after surgery, it is likely that additional subacute and or clinically less significant VTE events were missed. There also are practical matters that center around the use of extended-duration pharmacologic prophylaxis. Ownership of the anticoagulation regimens and the attendant costs and complications associated with this therapy for each patient, among other issues, may launch further debate in this space.

Kho and colleagues<sup>5</sup> should be commended for pursuing this analysis on extended pharmacologic thromboembolism in patients undergoing thoracic surgery. Their findings demonstrate that an extended 28-day course of pharmacologic prophylaxis can be delivered safely and may reduce the incidence of clinically significant postoperative PE. Although we eagerly wait for the findings from prospective randomized studies on the efficacy of extended-duration chemoprophylaxis in patients undergoing thoracic surgery,<sup>6</sup> these results from Kho and

colleagues<sup>5</sup> begin to fill a critical knowledge gap in postoperative VTE management in thoracic surgery. Posterity may reveal that provoking thoracic surgeons to consider extending VTE chemoprophylaxis to discharge and 28 days beyond surgery may be thinking that is lightyears ahead of conventional wisdom.

## References

1. 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.
2. National Comprehensive Cancer Network. NCCN Guidelines version 1.2022: cancer-associated venous thromboembolic disease. Accessed July 10, 2022. <https://www.nccn.org/guidelines/guidelines-detail?category=3&id=1423>
3. 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.
4. Agzarian J, Hanna WC, Schneider L, Schieman C, Finley CJ, Peysakhovich Y, et al. Postdischarge venous thromboembolic complications following pulmonary oncologic resection: an underdetected problem. *J Thorac Cardiovasc Surg*. 2016;151:992-9.
5. Kho J, Mitchell J, Curry N, Di Chiara F, Stavroulias D, Belcher E. Should all patients receive extended thromboprophylaxis after resection of primary lung cancer? *J Thorac Cardiovasc Surg*. 2022;164:1603-11.e1.
6. Shargall Y, Schneider L, Linkins LA, Crowther M, Farrokhyar F, Waddell TK, et al. Double blind pilot randomized trial comparing extended anticoagulation to placebo following major lung resection for cancer. *Semin Thorac Cardiovasc Surg*. 2021;33:1123-34.