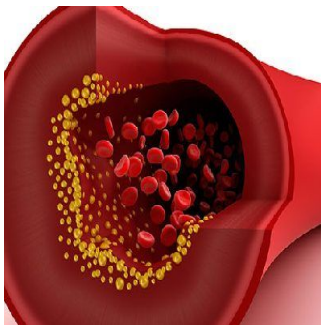


## Higher VTE Risk in Lung Cancer Surgery Patients



Lung cancer surgery patients are at greater risk of developing venous thromboembolism (VTE), including deep vein thrombosis (DVT) and pulmonary embolism (PE), than previously thought, with elevated risks of complications or death. These findings are based on three separate studies that examined the problem of VTE after surgery for lung cancer, indicating that extended use of blood thinners may help to reduce complications or mortality after lung surgery.

The three studies were presented at the 95th Annual Meeting of the American Association for Thoracic Surgery. The first study looked at outcomes for 157 patients who underwent thoracic surgery for primary lung cancer (89.9 percent) or metastatic cancer (6.3 percent). All patients received blood thinners and mechanical VTE preventative treatment (graduated compression stockings) from the time of surgery until leaving the hospital.

Two weeks later, patients were evaluated for the presence of VTE signs and symptoms. Patients who had developed symptoms suggestive of VTE within the 30 days after surgery underwent urgent CT-PE examination, and a repeat scan 30-days postoperatively if the first scan was negative. Patients with VTE were monitored and treated.

Among patients considered to be at high risk of VTE because of their lung cancer, researchers found 19 VTE events (14 PEs, 3 DVTs and 1 combined PE/DVT), equivalent to a 12.1 percent incidence rate. For all 157 patients, the 30-day mortality rate was 0.64 percent but 5.2 percent for those who had a VTE.

All those diagnosed with a VTE had undergone anatomic resections (lobectomy or segmentectomy) and most had primary lung cancer. The clots tended to form on the same side as the lung surgery. The researchers examined factors that might distinguish those who developed clots from those who did not, and could not find differences in age, lung function, hospital length of stay, comorbidities, lung cancer stage, smoking status or Caprini Score.

"This study shows that a significant proportion of lung cancer surgery patients are at risk of VTE, and indicates a need for future research into minimising the occurrence of DVT and PE," said Yaron Shargall, MD, who is Head of the Division of Thoracic Surgery and holds the Juravinski Professorship in Thoracic Surgery at McMaster University (Hamilton, ON). "It is possible that extended use of blood thinners beyond hospital discharge may reduce the number of patients who experience these life-threatening events and may help to reduce the rates of death after lung surgery."

A Cleveland Clinic study, meanwhile, compared the incidence of VTEs in 112 patients who underwent surgical removal of the lung (pneumonectomy) for benign/malignant indications and who were screened for these complications, with that of a previously published group of 336 similar patients who did not undergo VTE screening. Key results included:

- The percentage of in-hospital VTEs in the screened group was almost three-times higher than those not screened (8.9 percent vs. 3.0 percent) and more than twice as high during the 30-day postoperative period (13 percent vs. 5.0 percent).
- In the screened group, 10 of 112 patients had VTE detected by screening just before discharge and four additional patients developed symptomatic VTE within 30 days despite a negative pre-discharge screen.

At the Cleveland Clinic, routine screening for VTE after pneumonectomy prior to discharge was adopted in 2006. "We find that a large proportion (50 percent) of VTEs occurred prior to the time of discharge, and the risk of developing symptomatic VTE remained elevated for 30 days," said lead investigator Siva Raja, MD, PhD, of the Heart and Vascular Institute, Department of Thoracic and Cardiovascular Surgery, at the Cleveland Clinic.

Dr. Raja suggests that post-pneumonectomy patients be given blood thinner medications for a longer duration, as well as undergo repeat screening test for VTE even after discharge.

A separate study showed that the Caprini Risk Assessment Model (RAM) can be used to stratify post-surgical lung cancer patients according to VTE risk. The Caprini RAM is made up of about 40 risk factors, including open surgery, history of VTE, central venous access, BMI  $\geq$  30, and malignancy. Based on the Caprini score, patients may be categorised into moderate ( $\leq$ 4), high (5-8) and highest ( $>$ 9) VTE risk groups.

Researchers analysed data of 232 patients who underwent lung resection from 2005-2013, and found that the 60-day postoperative VTE incidence was 5.17 percent (12/232). Six of the 12 patients had a PE.

The mean Caprini score for those who developed VTEs was significantly higher than the mean score for those who did not have VTEs ( $11.83 \pm 3.74$  vs.  $8.07 \pm 2.84$ ,  $p < .001$ ). The incidence of VTEs was 0 percent in the low-to-moderate Caprini score group, 1.67 percent in the high Caprini score group, and 10.42 percent for those with the highest Caprini scores. The one death from a PE was patient whose score fell within the highest Caprini score group (16). When 9 was used as the cutoff for highest risk, the RAM had an 80 percent sensitivity, 60.9 percent specificity, and 61.2 percent accuracy, according to researchers.

"This risk assessment scoring system can be used to determine which lung resection patients may potentially benefit from preventive blood thinner therapy after discharge," said Virginia R. Little, MD, Associate Professor of Surgery, Boston University School of Medicine. "We have measured these scores and found that a prolonged course of enoxaparin sodium (Lovenox) or other blood thinners may improve the risk of dying of this complication after a lung cancer operation."

Source: [American Association for Thoracic Surgery \(AATS\)](#)

Image Credit: University of Alabama at Birmingham

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