Methods

The American College of Surgeons National Surgical Quality Improvement Program (ACS NSQIP) was used to identify patients who underwent anatomic lung resection between 2015 and 2018. Bivariate analysis and multivariable logistic regression were used to identify post-discharge VTE risk factors which were used to create a post-discharge VTE risk calculator. The cut-point with optimal sensitivity and specificity in predicting post-discharge VTE was calculated using Youden’s J Index.

Results

The study included 18,476 patients who underwent anatomic lung resection. Overall, VTE was diagnosed within 30 days of surgery in 224 (1.2%) patients with 203 (1.1%) diagnosed in-patient and 21 (0.1%) diagnosed post-discharge. Older age, male sex, non-Hispanic Black race, higher body mass index (BMI), longer operative time, longer post-operative length-of-stay, transfusion, myocardial infarction, chronic obstructive pulmonary disease, post-operative pneumonia, mechanical ventilation >8hrs, renal failure, and open pneumonectomy were identified as risk factors for overall risk of VTE. Post-discharge VTE was associated with BMI (odds ratio 1.06, 95% confidence interval 1.03-1.10 per point increase), open pneumonectomy (odds ratio 4.82, 95% confidence interval 1.28-16.7), and post-operative pneumonia (odds ratio 14.3, 95% confidence interval 5.87-34.8). Twenty iterations of 10-fold cross-validation yielded a mean C-statistic of 0.84 indicating good model discrimination for post-discharge VTE risk calculation. Predicted risk of post-discharge VTE after anatomic lung resection ranged from 0.02% to 8.95%.

Conclusions

VTE is an uncommon but potentially devastating complication after anatomic lung resection. Post-discharge VTE risk was associated with increasing patient BMI, open pneumonectomy, and post-operative pneumonia. Identifying patients at high risk for post-discharge VTE may help guide patient specific extended VTE chemoprophylaxis prescribing.