

## Risk factors and Associated Complication with Venous Thromboembolism in Patients with Craniotomy for Meningioma

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### Introduction

Patients undergoing surgical resection of meningioma are at increased risk for developing venous thromboembolism (VTE). Aim of this study was to assess the occurrence of VTE in patients operated for meningioma who developed VTE.

### Methods

The American College of Surgeons National Surgical Quality Improvement Project (NSQIP) database for the years 2012–2015 was reviewed for patients who had undergone meningioma resection according to their primary Current Procedural Terminology codes and International Classification of Diseases, Ninth Revision.

### Results

A total of 5036 meningioma patients were included in the study. The rate of VTE in this cohort was 3.38%, specifically 1.47% was pulmonary embolism (PE), and 2.42% was deep vein thrombosis (DVT). 15.29% of patients with VTE suffered from both PE and DVT. Of the 170 patients in this cohort with VTE, 44.44% was readmission for the first 30 postoperative days, 23.53% of patients returned to operating room (OR), and 5.88% of patients were death for the first 30 postoperative days. Multivariate binary logistic regression analysis confirmed 5 risk factors for VTE, including age = 60 years, ASA classification = 3 level, operative time = 310 minutes, ventilator dependent and pre-operative transfusions. Univariate analysis revealed a number of occurrence complications significantly associated with VTE, including unplanned intubation, ventilator > 48 hours, stroke, sepsis, septic shock, pneumonia, urinary tract infection and transfusions.

### Conclusions

Risk factors and associated complications were analyzed to identify associations with VTE in our study. Many of these risks can be identified before surgery and patients with these risks could be managed peri-operatively to reduce the VTE in the future.

### Learning Objectives

1. Analysis of outcomes for patients undergoing surgical resection of meningioma for developing venous thromboembolism.
2. Identification of pre-operative factors associated with VTE before surgery.
3. Identification of occurrence complications associated with VTE in the meningioma cohorts.

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