

### Introduction

- Patients undergoing craniotomy for brain tumors have an increased risk of developing venous thromboembolism (VTE), a condition that can lead to death via PE, prolonged hospital stay, and increased costs.
- Using the NSQIP database, we analyzed patients with brain tumors undergoing craniotomies to identify risk factors for post-operative VTE from 2006-2014.

### Methods

- Our study population, identified by CPT codes, included NSQIP patients who underwent a craniotomy for brain tumor resection as their primary procedure.
- Multivariate binary logistic regression was used to identify risk factors for post-operative VTE.

Table 1: Multivariable logistic regression model identifying predictors of VTE in patients undergoing craniotomy for brain tumors.				
Predictor	Definition	Odds Ratio	95% CI	P-Value
Age (years)	Lower quartile (<46)	Ref.	-	-
	Second quartile (46-57)	1.432	1.108-1.849	0.006
	Third quartile (57-66)	1.550	1.206-1.993	0.001
	Upper quartile (>66)	2.493	1.95-3.187	<0.001
	Missing	-	-	-
BMI (kg/m <sup>2</sup> )	Lower quartile (<24.2)	Ref.	-	-
	Second quartile (24.2-27.8)	1.070	0.825-1.388	0.611
	Third quartile (27.8-32.1)	1.432	1.122-1.828	0.004
	Upper quartile (>32.1)	1.835	1.448-2.325	<0.001
Functional Dependence		0.905	0.514-1.594	0.73
Ventilator Dependence		1.657	1.269-2.162	<0.001
Steroid Use		2.516	1.543-4.103	<0.001
Prior Sepsis		1.661	1.372-2.012	<0.001
Total operative time (minutes)	Lower quartile (<123)	1.845	1.33-2.56	<0.001
	Second quartile (123-183)	Ref.	-	-
	Third quartile (183-271)	0.909	0.615-1.343	0.631
	Upper quartile (>271)	1.462	1.034-2.068	0.032
Abbreviations: BMI=body mass index; VTE=venous thromboembolism				

### Results

- From 2006 to 2014, there were 629 instances of VTE among 19,409 total cases (3.2%) according to the NSQIP database.
- On bivariate analysis, 12 additional post-operative complications, including stroke/CVA, post-operative infection, and unplanned intubation were found to be more common in patients with VTE than those without.
- On multivariate analysis, risk factors for VTE included age (p<0.001), body mass index in the highest quartile (OR=2.190, p<0.001), impaired sensorium (OR=1.889, p=0.016), hemiplegia (OR=1.837, p<0.007), disseminated cancer (OR=0.546, p=0.021), steroid use (OR=1.784, p<0.002), and operation time in the highest quartile (OR=1.893, p=0.012).

### Conclusions

- According to the NSQIP database, VTE occurs in about 3% of patients undergoing craniotomy for brain tumor resection.
- Predictors for developing VTE include age, BMI, impaired sensorium, hemiplegia, steroid use, prior sepsis and total operative time.

### Learning Objectives

By the conclusion of this session, participants should be able to:

- 1) Understand risk factors for development of VTE in patients undergoing craniotomy for brain tumors.
- 2) Appreciate the overall increased risk of VTE in patients undergoing craniotomy for brain tumors.

### References

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