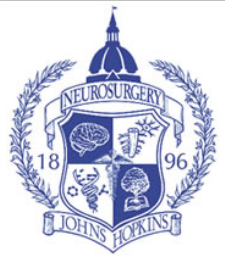




# Neoadjuvant Chemotherapy is an Independent Risk Factor of Stroke, All-Cause Morbidity, and Mortality in Elective Cranial Neurosurgery

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## Introduction

Neoadjuvant chemotherapy (NC) is sometimes utilized prior to primary surgical resection or radiation treatment in intracranial tumors. However, little is known about the effect of NC on postoperative surgical outcomes.

## Methods

Elective cranial neurosurgical patient data was obtained from the American College of Surgeons National Surgical Quality Improvement Program database between 2006 and 2012. The impact of neoadjuvant chemotherapy on 30-day all-cause postoperative morbidity, surgical site infections, and mortality were assessed. Adjusted odds ratios were estimated for surgical site infection, overall morbidity, and mortality using a multivariable logistic regression model, accomplished in stepwise fashion, for patients receiving NC versus those not receiving NC.

**Table 1**

Cerebrovascular Accident/Stroke with Neurological Deficit						
	Univariable Regression			Multivariable Regression <sup>§</sup>		
	Odds Ratio	95% Confidence Interval	P-Value	Odds Ratio	95% Confidence Interval	P-Value
No NC	Referent			Referent		
NC	<b>2.42</b>	1.03 – 5.70	0.042	<b>3.77</b>	1.51 – 9.41	0.004
30-Day Overall Morbidity						
	Univariable Regression			Multivariable Regression <sup>§</sup>		
No NC	Referent			Referent		
NC	1.45	0.99 – 2.12	0.059	<b>1.57</b>	1.04 – 2.36	0.032
30-Day Mortality						
	Univariable Regression			Multivariable Regression <sup>§</sup>		
No NC	Referent			Referent		
NC	<b>3.07</b>	1.56 – 6.05	0.001	<b>3.64</b>	1.72 – 7.70	0.001

Logistic models for surgical site infections, 30-day complications, and 30-day mortality for patients undergoing cranial neurosurgery.

## Results

This study analyzed 3,812 patients undergoing elective cranial surgery, with 152 receiving NC. NC patients had a complication rate of 23.68%, while patients not receiving NC had a lower complication rate at 17.65%. Multivariable regression analysis revealed that patients who received NC had significantly increased odds of developing a stroke with neurological deficit (OR=3.39; 95% CI:1.37-8.40) and all-cause postoperative morbidity (OR=1.57; 95% CI:1.04-2.37) over the control group. Finally, the NC cohort demonstrated higher odds of mortality following surgery than their non-NC counterparts (OR=3.81; 95% CI:1.81-8.02). Ninety-two patients (2.41%) died within 30 days, of which 10 (6.58%) receiving NC died versus 82 non-NC (2.24%) deaths (p=0.001).

## Conclusions

Neoadjuvant chemotherapy is associated with an increased risk of short-term stroke with neurological deficit, all-cause morbidity, and mortality in elective cranial neurosurgery.

## Learning Objectives

1. Neoadjuvant chemotherapy patients had a complication rate of 23.68%, while patients not receiving neoadjuvant chemotherapy had a lower complication rate at 17.65%.
2. Patients who received a neoadjuvant chemotherapy had a statistically significantly increased odds of developing a stroke with neurological deficit and all-cause postoperative morbidity
3. The neoadjuvant chemotherapy cohort demonstrated statistically significantly higher odds of mortality following surgery than their non-NC counterparts.

## References

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