

Introduction

Post-operative seizures complicate various types of cranial neurosurgeries and increase morbidity and/or mortality. The usage and choice of anti-epileptic medications (AED) for intracranial procedures remains controversial. Given the relatively high complication rate of cranioplasty, an understanding of seizure incidence and factors predisposing patients to post-operative seizures remains vital to treatment of these patients. Knowledge of the risks associated with this relatively frequent cranial neurosurgery informs consent of patients, patient safety, and operative preparations.

Methods

This study retrospectively reviews adult patients (>18 years age) who received cranioplasty from 2007-2015 at UNC Hospitals. Patients were stratified based on preoperative anti-epileptic medications, sidedness, material of bone flap, association with infection, and time between craniectomy and cranioplasty, among other variables. Early seizures were defined as clinical or electrographic events within 30 days of cranioplasty. Statistical analysis was performed using chi-squared test for categorical variables, whereas logistic regression was used for continuous variables.

Results

Between 2007 and 2015, 148 adult patients underwent cranioplasty. Overall complication rate was 19.6% and most frequent complication was seizure. A total of 15 patients (10%) experienced early post-operative seizures, 9 of whom did not have history of prior seizure. Of these 15 patients, 67% were left sided, 47% received synthetic bone flaps, 60% were male, and 53% were associated with infection. All patients with seizure history (51) received AEDs, and 6 of those (12%) seized. Statistical analysis showed no difference in post operative seizure between those with and without seizure history, and no relationship with timing or post operative infection.

Conclusions

Among adult cranioplasty patients with early post-operative seizures, the most frequent indication for craniectomy was infection of bone flap from prior craniotomy. The reported overall complication rate (19.6%) is comparable to other published reports in the literature; however, our series identified post operative seizure as the most common complication. Given that 10% of patients seized who had no seizure history, and 12% of patients on AEDs seized, this remains an important area of future study to reduce morbidity from this common surgery.

TABLE 1

Demographic	Number (%)	P value
Sex		1.0
female	55 (37)	
male	93 (63)	
Age (mean)	44	0.88
Indication for craniectomy		0.5
Traumatic brain injury	48 (32)	
Bone flap infection	35 (24)	0.2 (post hoc)
Ischemic stroke	29 (20)	
Intracerebral hemorrhage	13 (9)	
Subdural hematoma	9 (6)	
Cerebral edema	6 (4)	
Tumor	5 (3)	
Subdural empyema	2 (1)	
Unknown (outside hospital)	1 (1)	
History of seizure	51 (34.5)	0.8
Side of surgery (Left, Right, Bifrontal)		0.8
Left	73 (49.3)	
Right	67 (45.3)	
Bifrontal	8 (5.4)	
Implant material		0.8
autologous	86 (58)	
synthetic	62 (42)	
Time to cranioplasty (mean days)	149	0.59
VP Shunt	15 (10)	0.6
EVD used during OR	15 (10)	0.5
Disposition		0.5
Home	107 (72)	
SNF	24 (16)	
AIR	15 (10)	
LTACH	1 (1)	
hospice	1 (1)	
Length of Stay (mean days)	5.3	0.78
History of EtOH abuse	15 (10)	0.4
Repeat cranioplasty	4 (3)	1.0

TABLE 1. Patient Characteristics and relationship of complications to post-operative seizure

Learning Objectives

1)Review clinical outcomes and complications in adult patients who undergo cranioplasty. 2)Review incidence of early seizures after cranioplasty at a single institution. 3) Identify clinical risk factors associated with development of early post-operative seizures

References

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