

Intraoperative Angiography Does Not Lead to Increased Rates of Infectious Complications.

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Introduction

Surgical site infections (SSI) are a common nosocomial infection and are a major cause of morbidity and mortality in surgical patients. Known independent risk factors for SSI include increased operative time and combined multiple procedures. Intraoperative angiography (IOA) has been used for years as an adjunct to microsurgical clip ligation of intracranial aneurysms; however, routine use of IOA is debated. Longer operative and use of an additional procedure could increase the risk of SSI in these cases, although it has not been previously described. We aim to describe the infectious risk of using IOA at our institution.

Methods

Study Design

- Retrospective cohort study
- Data obtained by retrospective chart review of all patients admitted who underwent microsurgical clip ligation of an intracranial aneurysm between 2005-2012
- IOA used at surgeon's discretion.
- Primary outcome: occurrence of SSI
- Secondary outcome: occurrence of IOA influenced clip repositioning.

Variables: demographics, tobacco use, rupture status, medical co-morbidities, use of ventriculostomy, and use of IOA.

Statistical Analysis

- Univariate comparison of continuous variables with a normal distribution was assessed using 2-sample t-tests, and continuous variables not meeting the normality assumption were assessed using the Mann-Whitney U test.
- All categorical data was assessed by chi-square or Fisher exact test, as appropriate.
- Logistic regression was used to test bivariate associations between variables.
- $p < 0.05$ was considered significant.

Results

- 676 intracranial aneurysms were treated by craniotomy during the study period.
- IOA was used in 104 of these cases
- There were a total of 20 surgical site infections: 2 in the IOA group (1.9%) and 18 in the non-IOA group (3.1%)
- IOA was not found to be a statistically significant variable for infection ($p = 0.50$).
- No additional single variable measured had a statistically significant increase in infection
- There were no direct complications related to use of IOA (stroke, dissection, perforation).
- Repositioning of the clip secondary to IOA occurred in 22 cases (21%).

Table 1. Baseline demographics

	Infection (n = 20)	No Infection (n = 656)	P-Value
Age, years (mean, SD)	51 (16)	53 (11)	0.59
Sex			0.53
Male	4 (20%)	72 (11%)	
Female	16 (80%)	484 (89%)	
Systemic Infection	2 (10%)	46 (7%)	0.60
Ruptured Aneurysm	2 (10%)	172 (26%)	0.10
Tobacco Use	12 (60%)	442 (67%)	0.49
Diabetes Mellitus	2 (10%)	58 (9%)	0.86
Obesity	6 (30%)	202 (31%)	0.94
Ventriculostomy	4 (20%)	130 (20%)	0.98
Intraoperative Cerebral Angiogram	2 (10%)	102 (16%)	0.50

Conclusions

IOA is not associated with increased risk of infection, but did affect clip placement in 20% of cases in which it was utilized, and should therefore not be withheld for fear of infectious complications.

Learning Objectives

- Recognize that IOA is not associated with an increase in surgical site complications.
- Appreciate that IOA can affect clip positioning in nearly a quarter of cases when used appropriately.
- Understand that IOA does not impart a significant additional risk to the patient.

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