

Sterile Gelatin Film Reduces Cortical Injury Associated With Brain Tumor Re-Resection

Colin J. Przybylowski MD; Veronica So B.S.; Kaylee R. Detranaltes; Corey Tyler Walker MD; Jacob F Baranoski MD, BS;
Nader Sanai MD

Introduction

Recurrent intracranial tumors frequently require re-resection. Dural adhesions to the cortex increase the morbidity and duration of these revision craniotomies. We describe the use of a commercially-available sterile gelatin film to prevent meningo-cerebral adhesions and decrease the rate of surgically-induced ischemia from revision craniotomy.

Methods

This retrospective cohort study examined clinical and radiographic data from patients with recurrent glioma, meningioma, and metastasis who underwent re-resection at the Barrow Neurological Institute at least 30 days following their initial resection from 2013-2016. All patients had evidence of disease following multi-modal therapy and underwent diffusion-weighted MR imaging to identify tissue ischemia associated with revision surgical exposure.

Results

84 patients were included in the gelatin film group, and 86 patients in the non-gelatin film group. Patient age, sex, tumor pathology, tumor volume, tumor eloquence, laterality of surgical approach, history of radiotherapy, and time interval between resections did not differ between groups. Radiographic evidence of cortical ischemia following reoperation was less prevalent in the gelatin film group (13.1% vs. 32.6%; $p < 0.01$). In multivariate logistic regression analysis, no gelatin film ($p=0.003$) and larger tumor size ($p=0.02$) predicted cortical ischemia following revision craniotomy. Postoperative complications in the gelatin film and non-gelatin film group otherwise did not differ, including postoperative CSF leak (3.6% vs 4.7%, respectively; $p = 0.72$), infection (7.1% vs 8.1%, respectively; $p = 0.81$) and incidence of new or worsening seizures (2.4% vs 4.7%, respectively; $p = 0.42$).

Conclusions

Routine placement of a commercially-available sterile gelatin film on the cortex prior to dural closure is associated with decreased surgically-induced tissue ischemia at the time of revision tumor craniotomy.

Learning Objectives

1. Discuss how meningo-cerebral adhesions from previous tumor resections can increase the morbidity and duration of revision craniotomies.
2. Discuss the benefits of placing gelatin film over the cortex at the conclusion of the tumor resection to decrease surgically-induced tissue ischemia at the time of the revision tumor craniotomy.
3. Discuss potential disadvantages of placing gelatin film over the cortex at the conclusion of the tumor resection.

[Default Poster]