Minimizing Collateral Brain Injury Using a Protective Layer of Fibrin Glue: Technical Note.

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Abstract:

BACKGROUND: Neurosurgical procedures expose the brain surface to a constant risk of collateral injury. We describe a technique where the brain surface is covered with a protective layer of fibrin glue and discuss its advantages.

METHODS: A thin layer of fibrin glue was applied on the brain surface after its exposure in 34 patients who underwent different craniotomies for tumoral and vascular lesions. Data of 35 more patients who underwent standard microsurgical technique were collected as a control group. Cortical and pial injuries were evaluated using an intraoperative visual scale. Eventual abnormal signals at the early postoperative T2-weighted fluid-attenuated inversion recovery (T2FLAIR) magnetic resonance imaging (MRI) sequences were evaluated in oncological patients.

RESULTS: Total pial injury was noted in 63% of cases where fibrin glue was not used. In cases where fibrin glue was applied, a significantly lower percentage of 26% ($P < 0.01$) had pial injuries. Only 9% had injuries in areas covered with fibrin glue ($P < 0.0001$). Early postoperative T2FLAIR MRI confirmed the differences of altered signal around the surgical field in the two populations.

CONCLUSION: We propose beside an appropriate and careful microsurgical technique the possible use of fibrin glue as alternative, safe, and helpful protection during complex microsurgical dissections. Its intrinsic features allow the neurosurgeon to minimize the cortical manipulation

preventing minor collateral brain injury.