

Publication Brief

Flow-assisted Surgical Technique in Cerebrovascular Surgery

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INTRODUCTION

Cerebrovascular surgery is a technically challenging subspecialty of neurosurgery. The advent of rapid advances in endovascular technologies have made the pathologies that are brought to surgical attention increasingly complex.

Direct vessel flow measurements intraoperatively can provide valuable data in decision making and in direct evaluation of the success of the surgical intervention. A flow-based approach (FAST) can also help optimize neurosurgical interventions.

OBJECTIVE

To offer a comprehensive review of FAST for flow preservation in aneurysm clipping surgery and FAST in EC-IC Bypass for flow augmentation or flow replacement surgeries.

FAST IN ANEURYSM SURGERY

One of the major risks associated with aneurysm surgery is the potential for inadvertent occlusion or compromise of the vascular branches from which the aneurysm arises which can result in stroke.

- Use of quantitative measurements can provide a technique to reliably avert vessel compromise.
- The technique for flow measurement for aneurysm surgery is reviewed.
- Flow measurement of relevant vessels requires minimal time and little more dissection beyond that used for routine aneurysm dissection.
- Utility of FAST in aneurysm surgery is discussed. In 106 aneurysm clipped in 103 patients, 31.1% of the cases had significant (>25%) reduction in one or more vessels of interest. Clip repositioning resolved the issue in most of the cases.

FAST IN EC-IC BYPASS SURGERY

Flow Augmentation Surgery: Surgical goal is to augment flow to the ischemic hemisphere. FAST can be helpful in predicting graft patency and efficacy during flow augmentation STA-MCA bypass procedures.

- Technique for flow augmentation, including Cut Flow Index as a predictor of bypass success, is described.

Flow Replacement in Planned Vessel Sacrifice: Giant or complex aneurysms may require sacrifice of the patent vessel such as the carotid, which may result in ischemia or stroke in up to 30% of patients.

- Technique for flow replacement bypass using measurements before and after temporary occlusion to assess the potential flow deficit is described.
- FAST provides a mechanism for guiding graft selection to provide an optimal revascularization strategy. FAST can also be used to intraoperatively verify the function and adequacy of the bypass.

TRANSONIC COMMENT

This paper is a valuable comprehensive summary of the benefits of direct intraoperative boood flow measurements during various cerebrovascular neurosurgery procedures, with schematic and drawings.

REFERENCE

Amin-Hanjani S, Charbel FT, "Flow-assisted Technique in Cerebrovascular Surgery," Surgical Neurology. 2007; 68" S1-4 - S11. (Transonic Reference # 7560AH)



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