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EC-IC bypasses: Indications and Techniques in 2017

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Resumen

In the current cerebrovascular era with the rapid advancement in endovascular techniques, the initial indications for EC-IC bypass have diminished. However, the art of an EC-IC bypass remains an important armamentarium for practicing cerebrovascular surgeons. Moya-Moya diseases, certain aneurysms especially non-saccular and failed endovascular treated aneurysms (esp. flow-diverters), and skull base tumors may require EC-IC bypass for definitive treatments. In selected cases of cerebral ischemia, EC-IC bypass may still be warranted.

EC-IC revascularization can be divided into direct and indirect bypass. Several factors must be considered for EC-IC revascularization including: 1) the ischemic condition of the brain; 2) the existing cerebrovascular/tumor pathology; 3) the size of the donor and recipient vessels; 4) the characteristics of the graft/conduit; and 5) the techniques of anastomosis. There are several differences between indirect and direct revascularization. Indirect bypass requires time (months) for revascularization by promoting formation of new capillary network and collateral circulation. The flow augmentation is less robust with a smaller volume of total cerebral blow flow compared to direct bypass. In addition, the size of the recipient vessel in indirect bypass is less relevant compared to direct anastomosis (ideally > 1.5 mm).

The bypass technique itself has evolved over time. Hand sewn bypass remains the most common practice. However, it requires occlusion of both proximal and distal recipient vessel. Newer devices and techniques have developed using non-occlusion automated anastomosis system such as ELNA (Excimer Laser assisted Non occlusive Anastamosis) and C-Port xA Distal Anastomosis System. They are more expensive and typically require larger recipient vessels, but may reduce ischemic occlusion time.