

C-Port Flex-A–assisted automated anastomosis for high-flow extracranial-intracranial bypass surgery in patients with symptomatic carotid artery occlusion: a feasibility study

Clinical article

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Object. Preliminary experience with the C-Port Flex-A Anastomosis System (Cardica, Inc.) to enable rapid automated anastomosis has been reported in coronary artery bypass surgery. The goal of the current study was to define the feasibility and safety of this method for high-flow extracranial-intracranial (EC-IC) bypass surgery in a clinical series.

Methods. In a prospective study design, patients with symptomatic carotid artery (CA) occlusion were selected for C-Port–assisted high-flow EC-IC bypass surgery if they met the following criteria: 1) transient or moderate permanent symptoms of focal ischemia; 2) CA occlusion; 3) hemodynamic instability; and 4) had provided informed consent. Bypasses were done using a radial artery graft that was proximally anastomosed to the superficial temporal artery trunk, the cervical external, or common CA. All distal cerebral anastomoses were performed on M₂ branches using the C-Port Flex-A system.

Results. Within 6 months, 10 patients were enrolled in the study. The distal automated anastomosis could be accomplished in all patients; the median temporary occlusion time was 16.6 ± 3.4 minutes. Intraoperative digital subtraction angiography (DSA) confirmed good bypass function in 9 patients, and in 1 the anastomosis was classified as fair. There was 1 major perioperative complication that consisted of the creation of a pseudoaneurysm due to a hardware problem. In all but 1 case the bypass was shown to be patent on DSA after 7 days; furthermore, in 1 patient a late occlusion developed due to vasospasm after a sylvian hemorrhage. One-week follow-up DSA revealed transient asymptomatic extracranial spasm of the donor artery and the radial artery graft in 1 case. Two patients developed a limited zone of infarction on CT scanning during the follow-up course.

Conclusions. In patients with symptomatic CA occlusion, C-Port Flex-A–assisted high-flow EC-IC bypass surgery is a technically feasible procedure. The system needs further modification to achieve a faster and safer anastomosis to enable a conclusive comparison with standard and laser-assisted methods for high-flow bypass surgery.

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