Current Status of Brain Perfusion Adjuncts and Techniques for Open Aortic Arch Repairs

Lars G. Svensson, MD, PhD

Chairman, Heart & Vascular Institute
Delos M. Cosgrove Chair for Heart Disease Research
Professor of Surgery, Cleveland Clinic Lerner College of Medicine

DISCLOSURES

• No disclosures

Aorta Operations CCF Per Year

Aortic Surgery

Elective Aortic Replacement is Safe and Effective

Outcomes After Elective Proximal Aortic Replacement: A Matched Comparison of Isolated Versus Multicomponent Operations


<table>
<thead>
<tr>
<th>Procedure</th>
<th>Operative Mortality</th>
<th>Stroke</th>
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<tbody>
<tr>
<td>Isolated</td>
<td>0.5%</td>
<td>4%</td>
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<tr>
<td>Multi-component</td>
<td>2%</td>
<td>2%</td>
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Aortic Surgery

Outpatient Aortic Volume by Dept

DHCA 656 Patients, ESC

Risk of 30-day Stroke

Circulatory Arrest Time (min)

Nonparametric Regression
Logistic Regression
N = 641, P = 0.0058
Results

- Stroke 6.1% (CL 5.4% - 6.8%)
  - AX/SCA+SG 4% versus Other 6.7%
  - P=.05 (Propensity matched)

- Hospital Mortality 8.3% (CL 7.6% - 9.2%)
  - Femoral 11% versus AX/SCA+SG 7%
  - P=.02 (Propensity matched)

Antegrade versus Retrograde Brain Perfusion
N = 121 RCT

- Clinical Stroke 1/121 (0.8%)
- Mortality 1/121 (0.8%)
- Neurocognitive testing > imaging > clinical

Svensson, Blackstone, et al. JTCVS, '15
All 121 patients underwent total arch replacement; 74 procedures (61%) were done using the elephant trunk procedure. Replacement of the total aortic arch was performed using right subclavian arterial inflow, cooling to an esophageal temperature of less than 20°C using alpha-stat strategy, and circulatory arrest with the patient’s head down and packed in ice, and CO2 field flooding. Bispectral monitoring of anesthesia depth was routine, but not continuous electroencephalography. RBP was done by perfusing the distal superior vena cava with proximal occlusion.

Prospective Randomized Trial N=121

- Nasopharyngeal Temp < 20 deg C, Double Coolers
- Head down, packed in ice, CO2 flooding 10L
- Subclavian side branch inflow, 40 – 60 mmHg, 15 X 5min
- Retrograde Brain 20 – 30 mmHg
- Neurological Examination
- Preop + Postop MRI, Neurocognitive testing

Randomized Trial ABP vs RBP for Total Arch (N=121, 39% Redo, 61% ET)

- Mortality 0.8%
- Clinical Stroke 0.8%
- Imaging Stroke/Change 15%
- Neurocog Decline 18%
- Either 24%
- No Difference ABP vs RBP
- Stroke Posterior / C/Bellar silent
- Neurocog - no imaging changes

Blinded Imaging Changes
Frozen Elephant Trunk

- OUS
- Mortality ~6%
- Stroke ~6%
- SCI ~6%

E-Vita

What does today mean to us?