Learning Objectives

Participants will:

1. understand the spectrum of cerebral protective strategies that can be used for patients undergoing cardiac surgery

2. understand how cerebral monitoring modalities may influence the perioperative management of patients at risk for neurologic complications after cardiac surgery

Case #1

A 66 year old female with a prior history of type A aortic dissection s/p ascending aorta replacement now presents with increasing dyspnea on exertion. A TTE showed moderate-severe aortic insufficiency. On CT scan, she was found to have a dilating aortic root and arch. Her other medical history is significant for hypertension and hyperlipidemia. She is scheduled for a redo composite root and total arch replacement under deep hypothermic circulatory arrest (DHCA).

1. What are the surgical options for cannulation for bypass?
2. What temperature should be your target prior to the onset of DHCA?
3. Which site should be chosen for temperature monitoring?
4. What is the role for retrograde versus antegrade cerebral perfusion during DHCA?
5. Should you ice the head?
6. Is there any pharmacology that you can use to protect the brain?
7. What are the considerations for rewarming from DHCA?
8. What is your strategy for monitoring the brain?

Case #2

A 75 year old male (98 kgs, 170 cms) with a history of CAD was admitted with new onset unstable angina. He also has a history of HTN, COPD and a left MCA stroke that left him with residual right leg weakness. He has no TIAs. Angiography revealed severe 3v CAD: 70% D2, 75% OM, 95% RCA with preserved LV function. A carotid ultrasound reveals a left ICA stenosis of 80%. Labs were within normal limits. Preoperative medications include albuterol, aspirin, metoprolol, isosorbide mononitrate and simvastatin. He states that for the last few weeks he has been getting short of breath walking 4-5 blocks, before this time, he was walking 2-3 miles a day without SOB.

1. Should he have a CEA in addition to CABG?
2. Would you perform epiaortic scanning before the operation?
3. Would you try to convince the surgeon to do the CABG off-pump?
4. What monitors would you apply to detect cerebral ischemia?
5. What would be your target for intraoperative blood glucose?
6. What are the evidence based cerebral protection recommendations?

**Suggested reading**

8. Enomoto S, Hindman B, Dexter F, Smith T, Cutkomp J: Rapid rewarming causes an increase in the cerebral metabolic rate for oxygen that is temporarily unmatched by cerebral blood flow: A study during cardiopulmonary bypass in rabbits. Anesthesiology 1996; 84: 1392-1400


