

FORE-SIGHT ELITE Cerebral Oximetry Utilized to Maintain Normal S_tO_2 During Combined Coronary Artery and Aorto-Carotid Bypass Grafting

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A 56 year-old female with diet-controlled diabetes mellitus presented with a history of chest pain on exertion. Coronary angiography, performed via the femoral route, had demonstrated coronary artery disease with significant lesions in the left anterior descending, circumflex, and right coronary arteries. Coronary angiography via right radial access had not been possible due to an occlusion of the right subclavian artery. Carotid dopplers demonstrated disease in the right and left internal carotid arteries with < 50% stenosis bilaterally and retrograde flow in the right internal carotid artery suggestive of a proximal occlusion/obstruction. Retrograde flow was also noted in the right vertebral artery.

A CT of the thoracic aorta with contrast demonstrated normal aortic arch anatomy with an origin occlusion of the innominate artery, minimal right subclavian artery disease, an 80% stenosis at the origin of the right internal carotid artery, an origin stenosis of the left common carotid artery with a 60% stenosis at the origin of the left internal carotid artery, and a normal left subclavian artery. The right and left vertebral arteries were patent. Following discussion at a vascular MDT, the patient was listed for combined coronary artery bypass grafting in addition to a graft from the aorta to the right carotid arterial system.

Cerebral oxygen saturation monitoring using the FORE-SIGHT ELITE cerebral oximeter was commenced prior to the induction of anaesthesia. Standard monitoring was supplemented by direct measurement of arterial pressure from the left and right radial arteries and by measurement of central venous pressure. The induction and maintenance of anaesthesia were unremarkable.

The chest was opened, and the left internal mammary artery (LIMA) and a length of saphenous vein were harvested. The innominate artery, carotid-subclavian bifurcation, and the distal right carotid vessels were dissected out. The patient was

heparinised, the common carotid artery opened between clamps, and a graft was anastomosed end to side. The systolic arterial pressure was then reduced to 70 mmHg to allow side-clamping of the ascending aorta and attachment of the graft. Subsequently, the LIMA was placed to the left anterior descending coronary artery and the saphenous vein to the right coronary artery employing standard 'off-pump' procedures. The systolic pressure was again reduced to 70 mmHg to allow side-clamping of the ascending aorta and attachment of the saphenous vein graft.

Cerebral oxygen saturations were satisfactory throughout the above procedures. Interestingly, the right frontal saturations increased relative to the left frontal saturations immediately following completion of the aorta-carotid graft. The relative increase continued for the remainder of the case. There were no significant falls in cerebral oxygen saturations during the two periods of induced hypotension.

Cerebral oximetry was continued in the immediate post-operative period on the intensive care unit until the patient awoke with intact neurology after 5 hours following tracheal extubation.

Conclusion

Although this particular case did not require intervention or present an anomaly for investigation, this report demonstrates that FORE-SIGHT ELITE cerebral oximetry's constant measure of oxygen saturation provides the confidence of knowing patients are doing well and that their brains are protected during complex procedures. In situations where cerebral perfusion may be compromised by both the vascular pathology and the surgical procedure required to treat it, the information cerebral oximetry provides - and using that information to prompt intervention or confirm intervention is unnecessary - is invaluable.

