FORE-SIGHT ELITE Monitor Responsiveness to Hemodynamic Changes During Coronary Bypass Procedure

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An 83-year-old woman underwent elective coronary artery bypass grafts combined with aortic valve replacement. Bilateral cerebral oxygen saturation monitoring using the FORE-SIGHT ELITE cerebral tissue oximeter was initiated prior to the induction of anesthesia. Standard anesthesiology monitoring was supplemented by direct measurement of arterial and central venous pressures.

The induction and maintenance of anesthesia were unremarkable. Although there were no threatening changes in cerebral oxygenation recorded during the procedure, several interesting changes in cerebral oximetry readings were observed that coincided with specific events that would be expected to affect cerebral oxygen delivery.

A. The FORE-SIGHT ELITE cerebral oximeter revealed a clear increase in cerebral oxygen saturation during denitrogenation using 100% O_2 prior to induction of anesthesia.

B. When cardiopulmonary bypass (CPB) was stopped, the patient exhibited a transient period of hypotension. FORE-SIGHT ELITE revealed a coincident decrease in cerebral oxygenation which returned to an acceptable range when hypotension resolved.

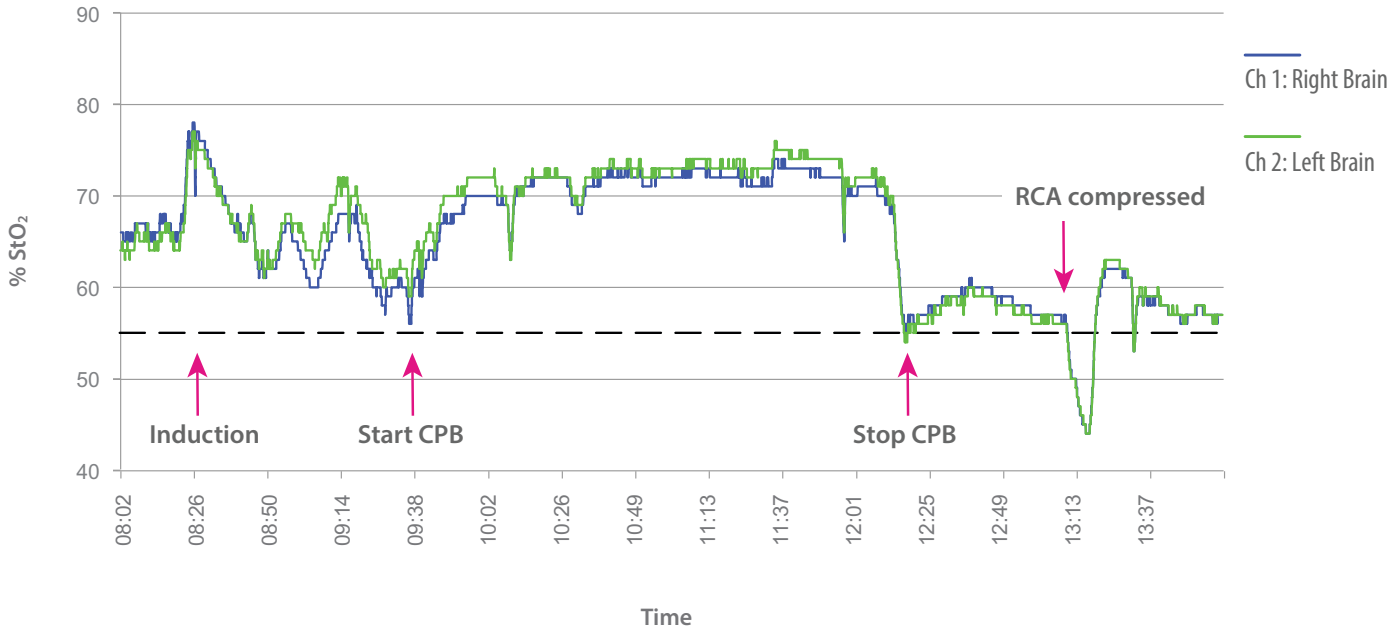
C. As the surgeon was closing the sternum and chest, cardiac output and mean arterial pressure significantly decreased, again coinciding with a decrease in cerebral oxygen saturation on the FORE-SIGHT ELITE monitor. Trans-esophageal echocardiography revealed decreased contractility of the right ventricle, likely related to compression of the right coronary artery (RCA). The chest and sternum were re-opened, resulting in a restoration of right ventricular contractility, cardiac output, and arterial pressure. Resolution of this problem was accompanied by a restoration of cerebral oxygenation as monitored by the FORE-SIGHT ELITE oximeter.

After surgery, the patient was transferred to the ICU. Although she suffered transient delirium during her ICU stay as determined by the Confusion Assessment Method, her neurologic status was intact at discharge.

Conclusion

This case report illustrates the responsiveness of the FORE-SIGHT ELITE cerebral oximeter during various hemodynamic changes that can occur during cardiac surgery. The high degree of responsiveness allows anesthesiologists and surgeons to assess the impact of changes in arterial oxygen saturation, systemic blood pressure, and cardiac output on cerebral oxygen delivery. It also illustrates that FORE-SIGHT ELITE may be useful in assessing the effectiveness of interventions to address decreases in blood pressure or cardiac output during surgery.

Note: *This patient was enrolled in a blinded clinical study of cerebral oximetry. The anesthesiologist was unaware of cerebral saturation readings in real time. Interventions for hypotension and low cardiac output were undertaken in response to information from standard monitors, not to the cerebral oximeter readings.*



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