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Using Cerebral Oximetry to Prevent Adverse Outcomes during Cardiac Surgery

JT Faulkner, M Hartley and A Tang. *Perfusion* 2010; 26: 79-81.

Introduction

This is a case report that describes a potentially life-threatening situation that was avoided only because the FORE-SIGHT Cerebral Oximeter measured a sharp decrease in cerebral oxygen saturation during an open heart surgery case utilizing cardiopulmonary bypass.

Case History

This case involved a 74 year old male receiving multiple coronary artery bypass grafts (CABG), replacement of the aortic valve (AVR) and repair of the mitral valve (MVR). Cerebral oxygen saturation was monitored with the FORE-SIGHT Cerebral Oximeter. The patient was "bi-cavally cannulated" with separate cannulae placed in the inferior and superior vena cava. After 48 minutes of cardiopulmonary bypass (CPB), the surgeon tightened the snares around the caval cannulae. Soon thereafter, there was a sharp fall in cerebral oxygen saturation to below 50%. None of the other OR monitoring equipment in use at the time suggested any problem or complication. Further investigation found that the superior vena cava cannula had slipped back into the right atrium, resulting in an interruption of venous drainage from the upper body. Repositioning the cannula resulted in an immediate restoration of drainage and a return of cerebral oxygen saturation to normal levels.

Author's Discussion and Conclusion

"During the incident, none of the other monitoring equipment indicated that there was a problem with SVC flow. All the readings at the time of the incident were within optimum range, with the exception of the FORE-SIGHT device. At the point when the caval tapes were snared, the pump was at full flow of 4.8 L/min, calculated with a cardiac index of 2.4 L/min/m², with no change in venous return, and the mean arterial pressure was maintained around 75 mmHg."

"This case study shows the importance of using cerebral monitoring alongside conventional monitoring systems. Even though there was an increase in CVP from -3 to 5 mmHg, this is usually not significant enough to warrant investigation by the surgeon to find a cause. Without the 'early warning' from the FORE-SIGHT, surgery would have carried on until the CVP did become high enough for one of the other monitoring devices to register a problem with cerebral blood flow congestion. This additional time with a lowered cerebral saturation level potentially could have led to serious neurocognitive dysfunction."

Citation

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