

Right Thoracotomy Case Study

INTRODUCTION

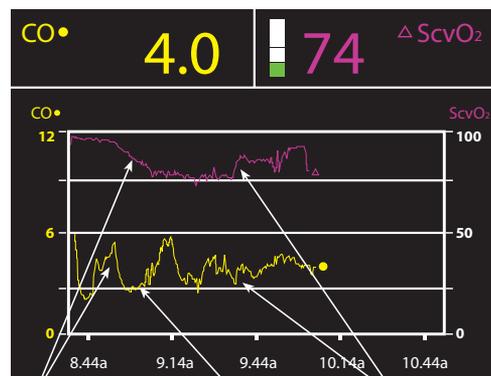
Thoracic surgical cases in which single lung ventilation is involved present a unique challenge to the clinician who is balancing the compromise of oxygenation and ventilation as well as cardiac output secondary to increased pulmonary vascular resistance. Arterial pressure-based cardiac output (APCO) monitoring and central venous oximetry (ScvO₂) enable clinicians to manage the balance between oxygen delivery and consumption more precisely than traditional vital signs alone.

Clinical Events

Patient Details: 68-year-old female, 5'4", 49kg
Medical History: Previous medical history of hypertension and COPD

CASE NOTES

A right thoracotomy was performed for the removal of a right lower lobe tumor. An epidural catheter was placed for post-operative pain management and the patient was placed under general anesthesia. The patient was intubated with a double lumen endotracheal tube to isolate and ventilate the right and/or left lung. A left radial arterial catheter was inserted and connected to an Edwards FloTrac sensor. An Edwards PreSep central venous oximetry catheter (ScvO₂) was inserted and both the FloTrac sensor and PreSep catheter were connected to the Edwards Vigileo monitor. Deflation of the right lung showed significant changes in ScvO₂ and cardiac output (see image) as changes in oxygenation and ventilation occurred secondary to the lung deflation. Also, changes in the pulmonary vascular perfusion occurred due to the deflation of the right lung. This resulted in increased pulmonary vascular resistance (PVR) and shunting of blood to the unaffected lung, which resulted in a decrease in the cardiac output.



Right Lung Deflated Volume Infusion Right Lung Inflated

DISCUSSION

The application of this less invasive, easy-to-use hemodynamic monitoring device allowed the clinician to optimize oxygen delivery while simultaneously differentiating the effects of changes in cardiac output and oxygenation. This case demonstrates that changes in ScvO₂ do not always reflect changes in cardiac output and vice versa, and that by differentiating these effects allows for more precise intervention when treating oxygenation, ventilation and cardiac output in the patient with single lung ventilation.

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