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SOAP 2025
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APRIL 30 - MAY 4, 2025
HILTON PORTLAND DOWNTOWN HOTEL • PORTLAND, OR

SPEAKER DISCLOSURE

I have nothing to disclose.

Pulse Oximetry Derangement After Intraoperative Blood Transfusion

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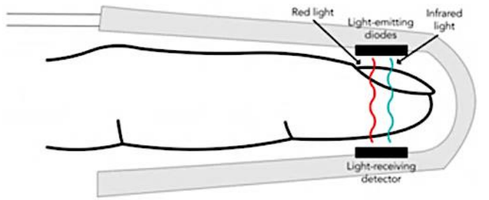
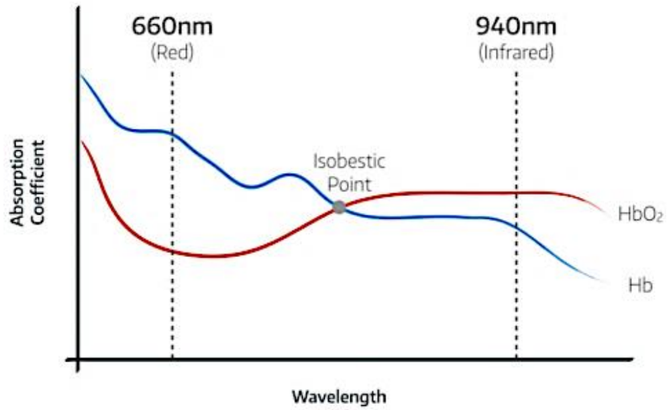
Background

- Pulse oximetry is well-known to utilize plethysmography, evaluating changes in light absorbance caused by pulsatile inflow of arterial blood[1].
- This renders transmission pulse oximetry susceptible to falsely low derangement, while in some cases, incidentally deriving valuable information on the status of extremity perfusion[2].
- Occurrence of falsely low pulse oximetry readings secondary to alterations in arterial perfusion pressure have been reported in several unique circumstances, though, it has been rarely cited as a result of blood transfusion
  - E.g. Raynaud's disease, Peripheral arterial disease, positional changes, Carboxyhemoglobin, Methemoglobin
- We present a case of temporary acute limb ischemia in the distal upper extremity following transfusion of packed red blood cells in a hemorrhaging post-partum patient under general anesthesia.





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Case Report

- A 37 y.o. G6P2 w/ PMHx PPH and AMA presented after repeat C/S, complicated by PPH secondary to uterine atony (requiring multiple agents for hemostasis).
- Over the course of 10 hours post-operatively, she experienced continued bleeding with symptomatic hypotension, despite administration of phenylephrine and multiple blood products. She was subsequently taken back to the OR for exploratory laparotomy, for evacuation of hemoperitoneum under GETA.
- Intraoperatively, a third unit of blood was initiated via pressure bag into an18G PIV in the L forearm, infusion warmer yet to be assembled.
- Seven minutes following transfusion initiation, there was a swift desaturation from 100% to 47% with no derangements in waveform amplitude.
- Mild hypotension was noted via NIBP with no other VS abnormalities. Epinephrine was administered for concern of impending hemodynamic compromise, and bag ventilation ensued.
- Patient examination six minutes after initial desaturation was notable for generalized pallor and a dusky, mottled appearance of the L distal upper extremity.
- The extremity was cold to the touch with lack of a palpable radial pulse. US exam revealed a constricted radial artery with pulsatility only visible with use of color doppler.
- The blood transfusion was immediately stopped, and warming blankets were applied to the UE.
- Transfusion reaction panel was obtained and later noted to be negative.
- Normalization of color and temperature began promptly; with full recovery achieved prior to emergence. The patient was asymptomatic following emergence, and later continued with an uncomplicated post-operative course.

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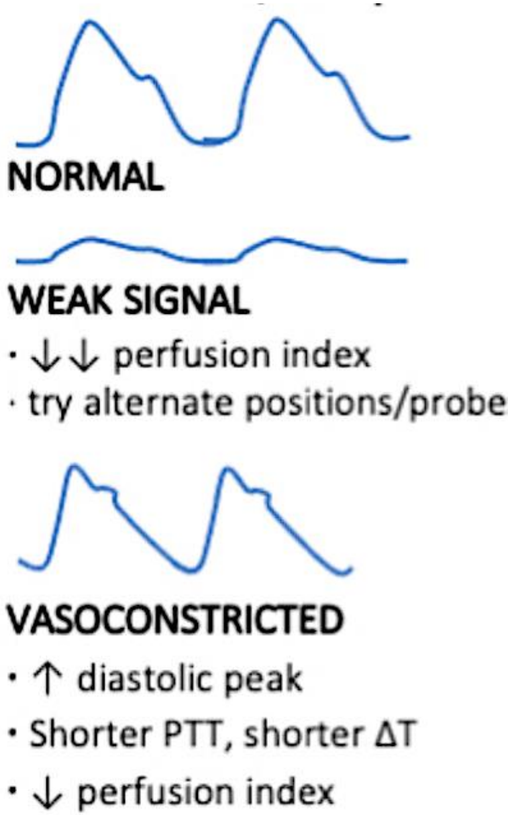
Discussion / Teaching Points

- A similar case report exists of acute upper extremity ischemia secondary to a Raynaud's attack precipitated by blood transfusion, only when transfusion rates exceeded critical levels[3].
- On interview post-operatively, our patient denied history of previous symptoms or Raynaud's disease; although, she endorsed family history of Raynaud's disease in her mother.
- In our case, false desaturation on pulse oximetry provided the benefit of prompt diagnosis and treatment of acute reversible upper extremity ischemia, with the cost of effecting anesthetic management when major cardiovascular compromise was postulated.
  - Although a dampened waveform was expected in the presence of decreased pulsatile flow, it is possible the limb maintained pulsatile blood volume despite vasoconstricted state, and resulted in the corresponding waveform shown in the figure.
- In summary, this case presentation explores the currently cited etiologies of false derangement of pulse oximetry while aiming to emphasize a circumstance in which a false desaturation caused concern for cardiovascular compromise intraoperatively during the immediate post-partum phase.



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