

Continuous Noninvasive Measurement of Hemoglobin via Pulse CO-Oximetry During Liver Transplantation, a Case Report

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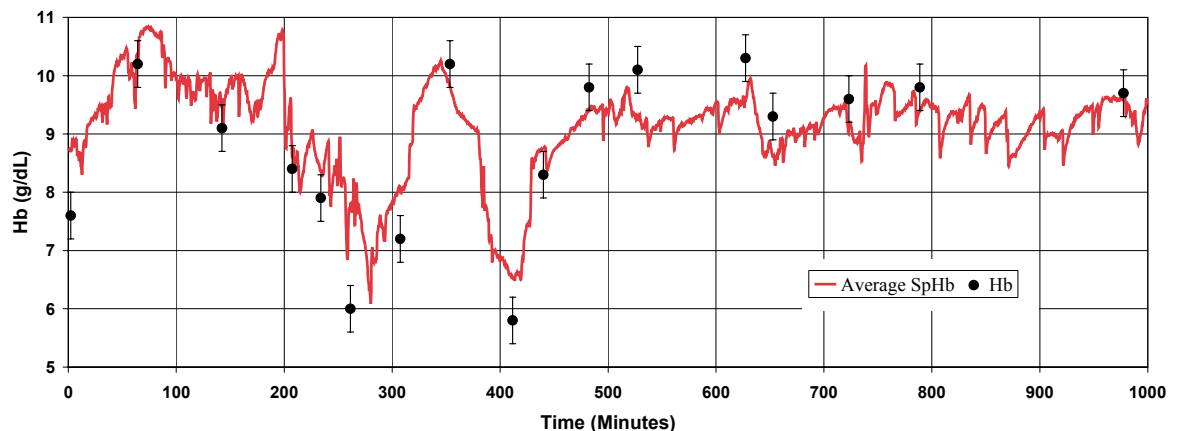
Introduction

This case report examines the ability of a Masimo engineering prototype to continuously and noninvasively measure total hemoglobin concentration (SpHb) during liver and kidney transplantation surgery.

Methods

A 65 year old female scheduled to undergo liver and kidney transplantation was monitored with three prototype SpHb sensors, optically isolated from each other and attached to a data collection system. The patient was monitored throughout the course of the surgery, for a total of 16.6 hours, during which 17 Hb/SpHb data pairs were collected. Arterial blood samples were collected every hour or more frequently if clinically indicated. Arterial blood samples were analyzed by a laboratory CO-Oximeter, the readings of which were statistically compared to the corresponding SpHb readings. Range, bias and precision were calculated from the average reading of the three SpHb sensors at each time point compared to the laboratory CO-Oximeter readings.

Results



Total hemoglobin ranged from 5.8 to 10.3 g/dL. The bias of the SpHb sensors was 0.146 and precision was 0.740. The precision of the CO-Oximeter was 0.4 g/dL.

Authors' Conclusions

“SpHb correlated well with CO-Oximeter determined Hb during most of this complicated procedure. Measurements showed good correlation during times of rapidly changing Hb concentration related to surgical blood loss and transfusion. Continuous and noninvasive hemoglobin monitoring would be an extremely useful tool in many clinical scenarios. This technology has the potential to greatly improve patient care and safety during surgical procedures.”