

Left Heart Hypoplasia: A Life Saved With the Use of a New Pulse Oximeter Technology

Goldstein MR. *Neonatal Intensive Care* 1998;12(1):14-17.

Introduction

When symptomatic, hypoplastic left heart syndrome causes congestive heart failure and circulatory collapse, the initial diagnosis and quick treatment can be a challenge to the most proficient caregiver. On initial exam, they are in respiratory distress, pale and moribund with weak pulses (often beyond palpation). This lesion, if undetected, is rapidly lethal with surgical intervention providing the only hope of survival.

Case Study Initial Findings

In 1995, a nine-day old infant was brought to the emergency department of a regional medical center. The child was pale, had a thready pulse, and circumoral cyanosis was evident. A Nellcor pulse oximeter was placed at multiple sites but no reading was acquired. Repeated attempts to obtain arterial blood gas specimen failed due to profound hypotension.

Case Study Results

Upon arrival of a neonatologist, the infant was tracheally intubated and hand ventilated with 100% oxygen. A cut-down provided umbilical artery access and several blood gases followed over the next five hours (see table). The neonatologist attempted, without success, to obtain a reliable signal with a Nellcor pulse oximetry and (after parental consent) resorted to a prototype Masimo pulse oximeter. Immediate values of saturation in the low 30's and pulse rate in the 40's resulted. The Masimo SET device continued to display during the following two critical hours of resuscitation and stabilization with the SpO₂ and pulse rate values corroborated by blood gases and the ECG heart rate. "The Nellcor pulse oximeter did not function at all during this period." Further workup revealed a hypoplastic left ventricle for which the child was medically stabilized, received a cardiac transplant eight days later and survives today.

Blood Gases Taken in the 1st Five Hours of Resuscitation

pH	PaCO ₂	PaO ₂	Base Deficit
6.56	88	29	off scale
6.73	98	36	off scale
6.88	61	23	26.2
7.07	35	65	-20.6
7.24	31	64	-18.2
7.42	36	43	-0.6

Author's Discussion and Conclusions

If untreated, left heart hypoplasia is fatal. A rapid response to the inevitable circulatory collapse is vital. A conventional pulse oximeter did not work in this situation. Whereas, Masimo SET pulse oximetry provided accurate, real-time data during resuscitation and stabilization of an infant with hypoplastic left heart syndrome. **"Were it not for the steady rise in % SpO₂ values, the resuscitative efforts for this baby would have been aborted. This newborn's life was likely saved by Masimo SET pulse oximetry."**