

# An Intubated Patient with a Blue Tongue: Don't Forget Benzocaine-Induced Methemoglobinemia

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## ABSTRACT

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## Introduction

Benzocaine-induced methemoglobinemia is a rare but life-threatening condition. An 83-year-old female with history of congestive heart failure underwent a transcatheter aortic valve implantation. Benzocaine was applied orally prior in preparation for a trans-esophageal echocardiogram. Shortly after the patient's O<sub>2</sub> saturation dropped from 97% to a persistent 85% despite giving 100% oxygen. Clinical signs of methemoglobinemia include cyanosis of the skin, oral mucosa (as seen in Figure 1), and nail beds, chocolate colored blood, dyspnea, hypotension, altered sensorium, seizures, and death [1,2]. In an intubated patient, a high level of clinical suspicion must be made as such symptoms are difficult to

observe. Cyanosis, along with a continuous O<sub>2</sub> saturation reading 85% is heavily suggestive of methemoglobinemia. Co-oximetry demonstrating elevated methemoglobin is required for making a definitive diagnosis. Benzocaine increases levels of methemoglobin by converting ferrous (Fe<sup>2+</sup>) to ferric (Fe<sup>3+</sup>). The binding of oxygen to methemoglobin results in an increased affinity for oxygen to the heme sites that remain in ferrous state. This leads to an overall reduced ability of red blood cells to release oxygen to tissues and a left shifted oxygen-hemoglobin dissociation curve. The body is in a functionally anemic and hypoxemic state [3].



**Figure 1:** A Patient with a Blue Tongue, a Clinical Sign of Methemoglobinemia.

This patient's cyanotic tongue and low O<sub>2</sub>% saturation prompted the use of methylene blue which acts by converting ferric back to the ferrous state [2,3]. We present this figure as a reminder to fellow anesthesiology practitioners of methemoglobinemia, a potentially life-threatening condition.

## References

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