Thermal Burn from Convective Warming Blanket In a Healthy Infant Undergoing Cataract Extraction

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Iatrogenic hypothermia is a major concern in pediatric anesthesia. It is further complicated by anesthetic-induced attenuation of thermoregulation. Mild intraoperative hypothermia in infants may lead to hypoxia, metabolic acidosis, cardiac arrhythmias, platelet dysfunction, and poor wound healing. As a result, forced air warming blankets have been utilized to diminish intraoperative heat loss. These devices have a considerable margin of safety, however there are case reports of thermal burns in pediatric patients. We present the case of a healthy infant who sustained burns on his extremities from a convective warming blanket during a routine sixty-minute procedure.

Case Presentation
A six-month-old healthy ASA 1 male presented for extraction of a left congenital cataract. The patient was brought to the operating room, standard monitors were applied, and general anesthesia was induced by mask. A peripheral IV was inserted, and intubation was performed. An esophageal temperature probe was inserted with an initial reading of 36° Celsius. A small pediatric underbody warming blanket and temperature management unit (Bair Hugger 555 and 505, 3M, St. Paul, MN) were in place and warming was initiated. The device was placed at the 43° Celsius setting.

Forty-five minutes after the start of the procedure, the patient’s temperature was found to be 38.1° Celsius. The warming blanket was turned off. The patient was extubated 15 minutes later and transported to the PACU in stable condition. Ten minutes after arrival to the PACU, the nurse observed formation of erythematous circular markings on his posterior left arm and leg, each 5 mm in diameter. The markings were in a pattern consistent with the perforations of the warming blanket. The patient was evaluated by anesthesia and plastic surgery, and he was ultimately discharged to home. At the time of discharge, the markings on his legs had nearly vanished, but the arm markings remained evident. All burns resolved within three days. The temperature management unit was quarantined and evaluated by biomedical engineering. It maintained a normal temperature output within standard deviation of the manufacturer’s guidelines.

Discussion
A literature search produced isolated case reports of pediatric thermal burns due to warming blanket devices. Affected patients were noted to have congenital heart disease, low flow states, and poor peripheral perfusion. Their intraoperative courses were remarkable for cardiac surgery, hypotension, and vasopressor or transfusion requirements. Other factors included use of a warming blanket for periods of greater than four to six hours, proximity of the unit hose to the patient’s skin, and use of the highest temperature setting. One specific case discussed the practice of “hosing”, or detaching the hose from the blanket and using the hose directly on a patient’s skin. This practice is not part of the manufacturer’s guidelines and is highly associated with burns in adults.

Our case was devoid of any cardiac history, intraoperative hypotension, abnormality in peripheral perfusion, or administration of blood or vasopressors. The manufacturer’s published use of this device was adhered to, and the device was operational for only 45 minutes. We did, however, use the device at its highest temperature setting.

Conclusion
Constant visual inspection of the patient and evaluation of the warming blanket is highly recommended during use of convective warming devices in all pediatric patients.

References

*Consent was obtained from the family for all pictures presented.