Refractory Hypotension Caused by Intraoperative Hypothermia

**In your facility, how is temperature monitored for a patient whose position limits access to oral and nasopharyngeal probes?**

A 60-year-old woman weighing 62 kg was scheduled for spine surgery with instrumentation. Her medical history included hypertension. At her preoperative visit, her blood pressure (BP) was 130/80 mm Hg and her heart rate was 78 beats per minute. Her history was negative for anesthesia complications.

The patient received her BP medication the night before surgery. She received general anesthesia and the anesthesia professional continuously monitored the patient’s vital signs, including nasopharyngeal temperature. After the surgical team positioned the patient prone on the Wilson frame, the temperature probe malfunctioned and the anesthesia professional was unable to monitor the patient’s temperature.

The procedure lasted six hours. During the procedure, the anesthesia professional administered warm intravenous fluids to the patient, and the patient remained hemodynamically stable until the instrumentation was completed. Her estimated blood loss was 1500 mL. She received 4000 mL of crystalloids, 1000 mL of colloids, and four units of packed red blood cells. After the blood products were infused, her hematocrit was 33% and her urine output was 1000 mL.

While the surgeon was closing the surgical wound, the patient’s systolic BP dropped to 80 mm Hg. Despite medical treatment with fluids and vasopressors, her BP continued to decrease to < 60 mm Hg. The surgeon quickly completed the procedure and the surgical team returned the patient to the supine position. The anesthesia professional was able to evaluate the patient more thoroughly in the supine position and to reapply the temperature probe. At this time, the anesthesia professional noted the patient was hypothermic, with a temperature of 31° C (87.8° F). The surgical team initiated rewarming with a forced-air warmer and warm IV fluids (40° C to 42° C [104° F to 107.6° F]).

The surgical team transferred the patient to the intensive care unit where she received ventilator assistance and vasopressors to maintain her BP. The intensive care medical team continued the rewarming until the patient’s core body temperature reached 36° C (96.8° F) and her BP increased to 114/70 mm Hg.

**TAKEAWAY**

Intraoperative hypothermia can occur during major surgeries because of the length of the surgery, the patient’s position, blood loss, and lack of active rewarming measure. A temperature monitoring device should be selected that can be accessed during the procedure and adjusted or changed when malfunctioning.

**Reference**

Burns Caused by Heating Pads

Do you follow manufacturers’ recommendations to prevent thermal injuries when using warming devices in the operating room?

Two adults sustained severe thermal injuries because of a malfunctioning electrical heating mat used during aesthetic surgery. In both cases, the patient was lying on top of the heating pad to prevent hypothermia.

Patient one was under general anesthesia during a rhytidectomy when the surgical technician noticed the patient was perspiring. The anesthesia professional and RN circulator checked the heating pad, and noted that the AC cable was connected to a 220-watt socket instead of the 110-watt power source recommended by the manufacturer. The surgical team stopped using the heating pad immediately and applied cool bandages to the patient’s back side. The patient developed blisters on the back, legs, and feet, with third-degree burns on the posterior leg and heel and second-degree burns on the back. The patient required wound care treatment for the burns after discharge.

Patient two was under a medullary block during an abdominoplasty and flank liposuction. During the surgery, the drapes underneath the patient became wet with saline solution. Several days after surgery, the patient noted a blister in the sacral area. The surgeon believed that the pooled saline solution caused the heating pad under the patient to become wet, which increased the heating potential of the heating pad.

Reference


TAKEAWAY

Using warming devices inappropriately or incorrectly may result in burns. In addition, preventing fluids from pooling underneath the patient is important in preventing thermal skin injuries. Patients who are anesthetized are unable to indicate when a warming device is malfunctioning, and this should be a consideration when choosing a method for intraoperative warming.
Hypothermia-related Cardiac Abnormalities

If a cardiac arrhythmia occurs during a surgical procedure, do you consider a differential diagnosis of severe hypothermia?

A 42-year-old man with Marfanoid syndrome underwent a procedure to repair a thoracoabdominal aneurysm. The anesthesia professional used sevoflurane and oxygen as the primary anesthetic. During the nine-hour and 42-minute procedure, the patient experienced bradycardia with a heart rate between 42 and 56 beats per minute. Before surgery, his heart rate was 84 beats per minute, and his electrocardiogram demonstrated normal sinus rhythm. His blood pressure and cardiac output remained the same as before surgery. The anesthesia professional did not note any abnormalities in the arterial blood gases.

The anesthesia professional administered 0.4 mg of atropine for bradycardia, which produced a minimal increase in the patient’s heart rate to 60 beats per minute. On the patient’s admission to the cardiac intensive care unit after surgery, his temperature was 33° C (91.4° F) and his electrocardiogram showed continued sinus bradycardia with Osborn waves (j-waves), prolonged QT intervals, atrial and ventricular dysrhythmias, and shivering artifacts. The Osborne waves disappeared eight hours after surgery when the patient’s blood temperature reached 36.8° C (98.2° F).

Hypothermia can induce a difference between epicardial and endocardial potassium channel currents, and the occurrence of Osborne waves represents this electrocardiographic change.

Takeaway

An abnormal electrocardiogram along with a low body temperature may indicate a potentially life-threatening degree of hypothermia. Being alert to electrocardiogram changes can assist in identifying a hypothermic patient who requires warming measures. A preoperative risk assessment that includes the length of surgery and patient co-morbidities helps to identify those patients who need close monitoring for heart arrhythmias.

Reference