Abstract 31

Perioperative Hypoxemia and Rhabdomyolysis in a Medically Complicated Patient

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Case Presentation: A 45-year-old morbidly obese (BMI > 43) male presented for biopsy and resection of an epididymal lesion. Past medical history included type 2 diabetes mellitus and antiphospholipid antibody on anticoagulation for prior deep vein thrombosis (DVT) and pulmonary embolus (PE). Coumadin was discontinued with normal international normalized ratio (INR). He preferred general anesthesia (GA) to subarachnoid block despite generalized muscle soreness after previous GA.

After induction of GA, a laryngeal mask airway was placed, and spontaneous ventilation ensued with maintenance sevoflurane. Within 1 hour of induction, the patient became mildly tachycardic and hypoxic, with presumed obesity hypoventilation syndrome, requiring endotracheal intubation facilitated by succinylcholine and propofol. Hypoxemia was unresolved despite clear, equal breath sounds. Arterial blood gases were pH 7.15, pCO_2 59.8 mm Hg, pO_2 78.5 mm Hg, HCO_3 20.3 mmol/L, and potassium 6.43 mEq/L. Chest radiograph and fiberoptic bronchoscopy were reassuring. Skin mottling and sweating were noted at the end of the procedure, with tachycardia to 120 bpm. An emergent computed tomography scan was negative for PE, and an electrocardiogram showed sinus tachycardia without other abnormalities. Within 5 hours of GA induction, hypoxemia and hypercarbia began to improve, but cola-colored urine was noted, suggesting elevation of creatinine phosphokinase (CPK) and troponins. Hyperkalemia was treated with insulin. In the medical intensive care unit (ICU), the patient was sedated and hydrated overnight, and he was weaned from mechanical ventilation the following morning.

Rhabdomyolysis was identified by the medical ICU team with initial CPK > 9,000 U/L. The anesthesiologist was unaware until the following morning, strongly suspected malignant hyperthermia (MH), and discussed this diagnosis with the medical team. Intraoperative hyperthermia to 38.7°C was then discovered, overlooked during distracting events. The patient received sodium bicarbonate for myoglobinuria and physical therapy for muscle weakness. CPK levels peaked at 99,000 U/L on postoperative day 2 and decreased prior to discharge home on postoperative day 5 with baseline renal function, on anticoagulation therapy, or physical therapy for weakness, and with awareness of his MH susceptibility. Caffeine-halothane contracture testing is planned in several months to confirm the diagnosis, and he will enter the North American MH Registry.

Discussion: Confounded by morbid obesity–related hypoventilation, hypercoagulability, and suspected PE, this patient's care and presumptive diagnoses required collaboration between surgical, medical, and anesthesia teams, leading

to enhanced learning about this rare genetic disease. A syndrome of MH-like hyperthermia and hypermetabolism is described in new-onset type 2 diabetes mellitus in adolescents and young adults, and was included in his differential diagnosis. Additionally, the patient takes bupropion, an atypical antidepressant that has been associated with neuroleptic malignant syndrome, which can present similarly to MH. The patient also has symptoms suggestive of underlying myopathy.

Conclusions: Collaborative, interdisciplinary care achieved a good outcome for this patient with multiple medical problems and a confusing intraoperative and postoperative course. The case was an intriguing learning opportunity for distinguishing causes of perioperative rhabdomyolysis and hyperthermia.