Case Presentation

A 13-year-old, 33-kg wheelchair-bound female with neuromuscular kyphoscoliosis presented for posterior spinal fusion with instrumentation (T2 to pelvis). The indication for surgery was scoliosis that caused difficulties sitting and respiratory compromise with desaturations even when awake. Her past medical history was significant for a motor vehicle accident that caused diffuse axonal injury, pontine and thalamic infarcts, spastic quadriplegia, hydrocephalus s/p ventriculo-peritoneal shunt, G-tube dependence, and obstructive sleep apnea with central apnea.

A standard multidisciplinary process of preoperative assessment was conducted. Intravenous induction and intubation, along with large-bore intravenous access and arterial line placement were performed. Anesthesia was maintained using sevoflurane and a sufentanil infusion. Somatosensory- and motor-evoked potential monitoring were attempted, but reliable potentials could not be obtained.

The initial hematocrit was 36 and with blood loss of 800 mL, the ending hematocrit was 22. Approximately 700 mL of cell saver was transfused. The perfusionist subsequently noted that the cell saver unit was unwashed. Considering the unintended administration of heparin with the unwashed unit, an ACT value of 210 was obtained. To reverse the heparin effect, 10 mg of intravenous protamine was given. The follow-up ACT was 140. At the end of surgery, the patient was noted to have hematuria, which cleared in the immediate postoperative period. She had no other postoperative complications.

Conclusion

The use of cell saver in spine surgery is known to decrease the amount of intraoperative allogeneic blood transfusion. Auto-transfusion of unwashed blood can cause embolic phenomena from cell debris, renal failure and hemoglobinuria from free hemoglobin, cardiorespiratory failure from cytokines, and coagulopathy due to mechanisms such as factor activation, consumption, and residual heparin. Mechanisms for hemoglobinuria may be related to renal injury from incomplete washing of blood pigments, contamination of debris such as bone materials and fat, and suction-induced hemolysis from air bubbles mixing with blood in the suction cannulae.

This is the first reported case of a patient undergoing scoliosis correction to be transfused with unwashed cell saver. Although no patient harm occurred, the unwashed cell saver is likely to have caused hemoglobinuria. This case emphasizes the need for the anesthesiologist to be aware of blood processing techniques and associated perioperative risks.

References