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Purpose: Intestinal transplantation is the newest and one of the most difficult of organ transplantation, associated with significant mortality. Understanding metabolic changes and maintaining electrolyte balance in relation to the newly perfused organ is necessary to achieve safe anesthetic management. We report the first case of anesthesia for cadaveric donor intestinal transplantation in an infant with intestinal failure.

Clinical Features: The patient’s parents have given consent to the publication of this case report. The patient was a 4-month-old male infant (64 cm high and weighing 5.9 kg) diagnosed with irreversible intestinal failure secondary to intestinal atresia. He had required TPN for the last 3 months, with several complications such as frequent catheter related sepsis and liver cirrhosis. He was scheduled for emergency isolated small bowel transplantation from cadaveric donor. A donor intestine had been harvested from a 9-yr-old female who died of cerebral hemorrhage and the cold ischemic time was 7 hrs. Preoperative EKG, chest X-ray, arterial blood gas analysis and vital signs were unremarkable, with the exception of AST/ALT and bilirubin. General anesthesia was induced with sodium thiopental and rocuronium and was maintained with atracurium, remifentanil and desflurane. Maintenance fluid requirements were replaced with balanced crystalloid solutions, albumin, hydroethyl starch and dopamine was infused continuously. After graft reperfusion, he developed a significant increase in serum potassium levels and was treated with calcium gluconate, insulin, sodium bicarbonate, furosemide and steroid. Despite aggressive treatment, profound metabolic acidosis was not resolved. On the 2nd operative day, severe coagulopathy, anuria, bradycardia, hypotension and cardiac arrest occurred and he was declared dead.

Conclusion: Pediatric intestinal transplantations are associated with pronounced electrolyte disturbances in the perioperative period. In the immediate post-reperfusion period, the damage related to ischemia and cold storage is increased by the biochemical and immunological reactions [1]. Graft reperfusion cause hemodynamic instability due to changes in acid-base status when the preservation solution is flushed out of the graft. The pH reduction is due to a greater acidic load from the ischemic bowel into circulation, associated with a parallel increase in PaCO2. The increased serum potassium is attributed to the load of metabolic products that the graft releases in the circulation. Intestinal wall damage can cause a hypocoagulative status [1]. Therefore, a careful control coagulation indicators and an early replacement of coagulative factors during the transplant are necessary. Worse factors impacting the survival of children for intestinal transplantation are age <1, surgical disease, liver fibrosis or cirrhosis, bilirubin >3 mg/dl and thrombocytopenia [2]. An intensive intraoperative monitoring of plasma biochemistry is needed to improve outcome and reduce intestinal ischemic damage in infants with risk factors.

References: 1. Transplant Proc 2006 38: 1148-50
2. Transplantation 2008 85: 1287-9