

Anesthetic Management in a Pediatric Patient Undergoing Hyperthermic Intraperitoneal Chemotherapy for the Treatment of Desmoplastic Small Round Cell Tumor: A Case Report

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Introduction

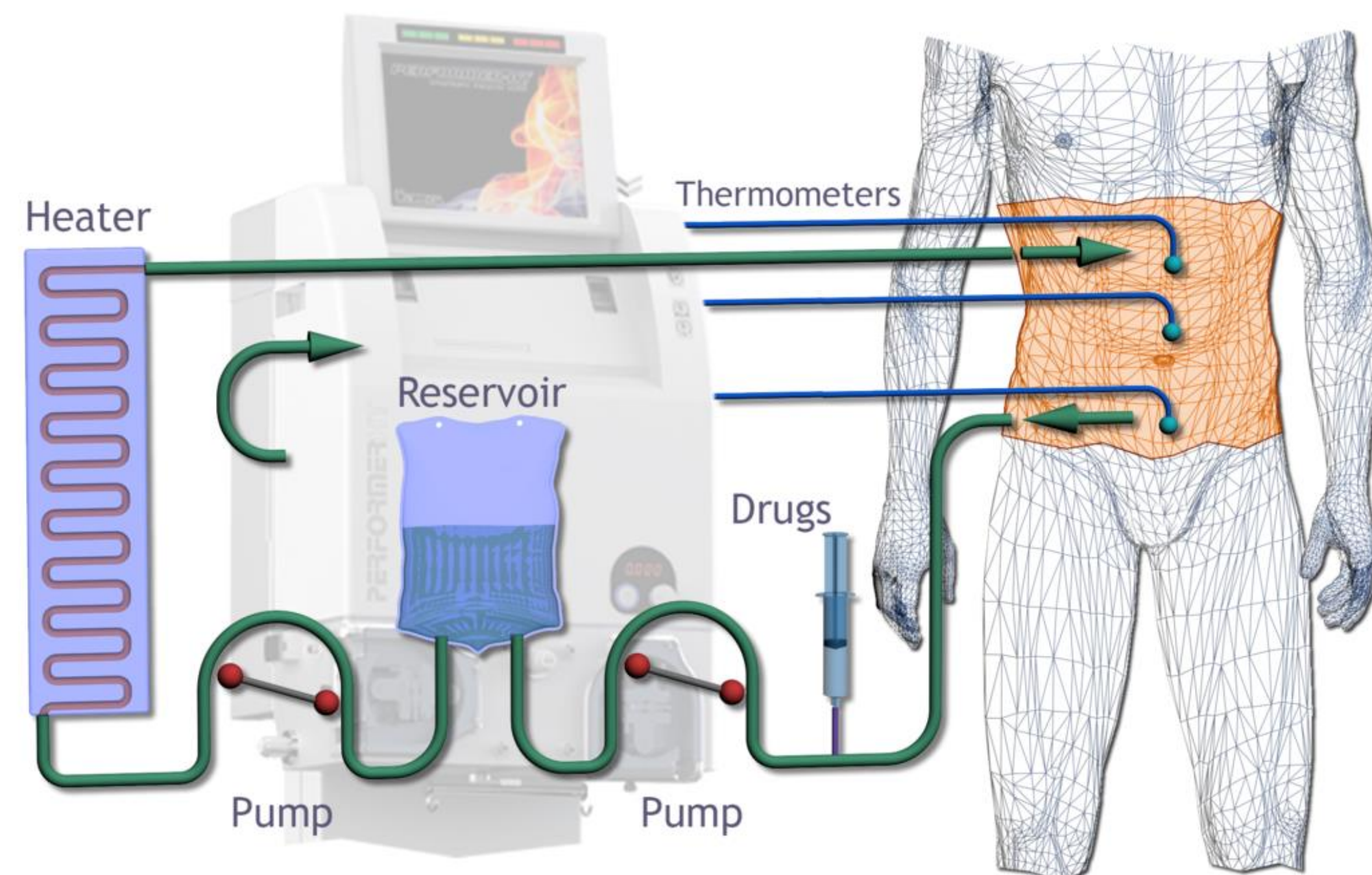
- Desmoplastic small round cell tumors (DSRCT) are a type of aggressive sarcoma affecting young males (1)
- Hyperthermic intraperitoneal chemotherapy (HIPEC) has been used in the treatment of adults with carcinomatosis
- HIPEC involves the application of heated chemotherapeutic agents directly to the abdominal cavity in combination with tumor debulking
- HIPEC procedures are a complex and potentially morbid procedure with adult operative morbidity being 40% (2)
- As children with sarcomatosis were only previously offered palliative chemotherapy or radiation, HIPEC has started to become a treatment option
- To date, there are only 3 case reports in the literature regarding anesthetic management in pediatric HIPEC procedures.

Case Description

- 17-year-old male presenting with DSRCT unresponsive to chemotherapy was scheduled to undergo tumor debulking and HIPEC
- In the operating room, an epidural was placed under sedation followed by standard induction of anesthesia, endotracheal intubation, central line placement, and arterial access
- Thirty minutes prior to beginning the HIPEC infusion, the room was cooled to 18°C and ice packs were placed around the head, axilla and groin
- An underbody cooling blanket was set to 0 °C and the forced air blanket was placed on ambient
- Cisplatin warmed to 42°C was infused for 90 minutes, during which, we were able to keep his maximum core temperature at 37.7°C
- In order to maintain urine output at 2mL per kg per hour, over 5L of normal saline and 1L of albumin were administered during the procedure
- He developed a metabolic acidosis to a pH of 7.21 as well as mild coagulopathy, not necessitating transfusion
- Subsequently transported to the PICU intubated, and extubation occurred post-op day 2 after normalizing his acid base status
- Developed a mild increase in his creatinine which resolved by post-op day 3

Discussion

- As HIPEC gains increased interest, there are many considerations to be addressed by the pediatric anesthesiologist due to the high morbidity associated with the procedure
- Complications include consumptive coagulopathy, nephrotoxicity, peripheral neuropathies, seizures, and arrhythmias
- Hyperthermia is the key derangement, with the acceptable mean core temperature established as 39.2 °C at many institutions (3)
- The hyperthermia induced hyperdynamic state leads to an increase in heart rate, cardiac index, and oxygen consumption., and the fall in peripheral vascular resistance may necessitate the use of inotropes/vasopressors
- There is a high risk of renal dysfunction (between 1-10%) and renal protection depends principally on attention to volume status
- While there are reports of some institutions utilizing dopamine or diuretics, there is little evidence to suggest this improves outcomes
- Moving forward, long term prospective studies are required to determine the efficacy of this treatment modality as well as the optimal anesthetic management in the pediatric population



Hyperthermic Intra-Peritoneal Chemotherapy (HIPEC)

References

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