Massive Transfusion Protocol During Resection of a Sacrococcygeal Teratoma

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**Introduction**

- Massive blood transfusion is described as replacing a patient’s entire blood volume one or more times.
- Can affect coagulation, electrolyte concentrations, acid-base balance, and body temperature.
- The decision of when and how to transfuse must be made carefully in a pediatric patient.
- In this report, we describe a premature two-day-old infant who presented for resection of a sacrococcygeal teratoma (SCT) and the value of a massive transfusion protocol in a pediatric setting.

**Case Presentation**

- A 3.4 kg, two-day-old infant, born at 31 weeks via c-section presented to the OR for SCT resection.
- This was necessitated by intra-tumor bleeding.
- Presented with a 2.5 uncuffed endotracheal tube in situ and a PIV for access.
- A massive transfusion protocol (MTP) was activated and blood products were made available.
- A broviac was placed following induction.
- A radial arterial line was also placed for HD monitoring and ABG assessment.
- Anesthesia was maintained through sevoflurane, fentanyl and vecuronium.
- Because of ongoing bleeding and unexpected surgical complications, the patient required a significant amount of blood products.
- These products were readily available from the blood bank throughout the case due to the initiation of our protocol.
- Labs were sent according to our institution’s protocol, and abnormal values were corrected as indicated.
- Our 3.4 kg patient received a total of 800 ml of PRBCs, 230 ml of platelets, 180 ml of FFP and 3 units of cryoprecipitate.
- At the conclusion of the procedure, the patient was brought back to the NICU intubated and in stable condition.

**Discussion**

- SCTs, although usually benign, can cause significant morbidity in selected cases because of the tumor’s mass effect and vast blood supply.
- Massive transfusion may be required.
- A MTP is initiated when massive blood loss is expected or when one circulating blood volume has already been lost.
- The endpoint of the MTP is when life-threatening bleeding has ceased.
- The purpose of a MTP is often to prevent the anticipated complications of thrombocytopenia, depletion of coagulation factors, acid/base disturbances, hypothermia and transfusion reactions.
- A MTP also aids the anesthesiologist logistically. The provider may focus more on the patient because a streamlined protocol is in place.

**Learning Points**

- Improved outcomes have been noted in studies where a MTP is utilized in adult trauma patients.
- There is less data regarding the use of such protocols in pediatric patients.
- Larger, prospective studies of a MTP in pediatric patients are still required to determine if improved outcomes do exist in this particular group of patients.
- However, due to the potential clinical benefit, and based on our experience, we would recommend the availability of a pediatric MTP.

**References**