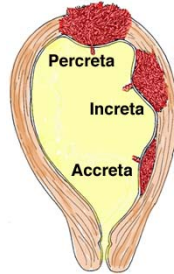


Coordinated Care in Massive Obstetric Hemorrhage

The Problem

A 32 year-old female presented to Labor & Delivery at 31 weeks gestational age with known placenta percreta for Cesarean/hysterectomy. Her obstetrical team recognized the potential for massive hemorrhage and began planning months in advance.

Placenta percreta is associated with a high morbidity and mortality, and many aspects of the Institute of Medicine Dimensions of Quality Care were required – Effectiveness, Efficiency, Timeliness, Safety, and perhaps most importantly, Patient Centeredness. Preparation for this case was markedly different from a normal delivery.



Goals

Our goals were 1) deliver a viable, healthy infant and 2) maintain end-organ perfusion to minimize morbidity to the mother in the face of massive hemorrhage.

The Team

Multidisciplinary, collaborative pre-operative planning group	Additional colleagues called to the operating room to assist
Anesthesiology team	Acute Care Surgery team
Blood Bank team	East OR staff/team
Gynecology/Oncology team	Perfusion (cell saver) team
Interventional Radiology team	Vascular Surgery team
Neonatology team	
Obstetrics and L&D nursing team	
Urology team	

The Interventions

The anesthesia team was divided into roles - one person was assigned to each of the three intravenous catheters, one person charted and sent labs every 30 minutes, one checked and distributed blood products and one communicated with the OB team, administered miscellaneous medications (calcium, antibiotics, muscle relaxant, narcotics, anti-fibrinolytics). Coordinating everything was one senior anesthesiologist who was designated team leader. A dedicated OB nurse made continuous trips to the blood bank with coolers.

Transfusion totals included 73 units of pRBC's, 72 units of FFP, 66 units of platelets, 12 units of cryoprecipitate, ten liters of crystalloid and a liter of cell saver.

Obstetrics and anesthesia maintain preparedness for cases of this magnitude with simulation as well as a maintaining an obstetric hemorrhage protocol.

The Results

After approximately 12 hours (8 hours in the operating room, 4 hours in interventional radiology) the patient was transferred to the Finard ICU intubated in stable condition on a low dose vasopressor infusion. A balanced transfusion ratio of 6:6:6:1 (pRBCs, FFP, platelets and cryoprecipitate) had been designated in advance and was reflected in every cooler received from the blood bank. Only three calls to the blood bank for general updates were required the entire case. Estimated blood loss was greater than 60 liters.

Labs upon arrival in the ICU showed a pH of 7.53, a normal ionized Ca⁺⁺ (nadir was 0.26), lactate was 3 mmol/L (peak = 8.3), Hct was 25% (nadir was 21%). Coagulation profile demonstrated an INR of 1.3 (peak = 1.5), fibrinogen of 203 and platelets of 79,000 (nadir 62 K).

Mother was extubated on POD #5 and transferred to the floor on POD #8. Her newborn son was transferred to the NICU for care related to his prematurity.

Lessons Learned

Preparation for these patients demands coordination among multiple disciplines well in advance of delivery. Interventional radiology was involved pre-operatively but general surgery and perfusion (for cell saver) were not; given the important role they ended up playing it would have been optimal to include them in surgical planning.

Assigning specific roles to each anesthesia provider in the operating room was essential to maintaining order in the controlled chaos of having multiple surgical teams in the operating room and the near-constant checking, documenting and administration of over 150 blood products.

The unconventional 6:6:6:1 ratio of pRBCs, FFP, platelets and cryoprecipitate transfusions resulted in minimal coagulopathy both intra-operatively and post-operatively.



Next Steps/What Should Happen Next

A post-operative debriefing with nearly all involved parties led to several suggestions for future similar cases including a more standardized pre-procedural checklist, involvement of several departments earlier, and a more in-depth discussion of whether these cases should be done on Labor & Delivery or downstairs in the main operating room.

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