

The Utility of Rotational Thromboelastometry (ROTEM) in Guiding Anesthetic Management for High-Risk Obstetric Patients

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Introduction

Postpartum hemorrhage (PPH) is a significant cause of maternal morbidity and mortality worldwide. Effective management relies on the early identification and treatment of coagulopathy to guide transfusion and hemostatic strategies. The rotational thromboelastometry (ROTEM) device is a point of care testing tool that aids in early detection and management of coagulopathies. We present the case of a patient who presented at our institution with a large placental abruption and how ROTEM was utilized to optimize her care.



Figure 1. ROTEM Sigma device

Case Report

- A 28-year-old female, G2P0101 at 34 weeks of gestation, presented to labor and delivery triage for abdominal pain.
- Past Medical History: Migraines, anxiety, non-insulin-requiring gestational diabetes, preeclampsia and LTCS (low transverse cesarean section) at 34w5d for placental abruption in prior pregnancy.
- Preoperative assessment: She met criteria for diagnosis of preeclampsia with severe features and had a category II fetal heart rate tracing. Anesthesia team notified that she would proceed with c-section.
- The ultrasound revealed a large retro-placental clot concerning for placental abruption. OB team sent full set of labs.
- Her tracing worsened and the need for c-section became urgent, so we ran a ROTEM.
- Upon arrival to the OR, ROTEM values concerning for hypofibrinogenemia, so we proceed with general anesthesia.

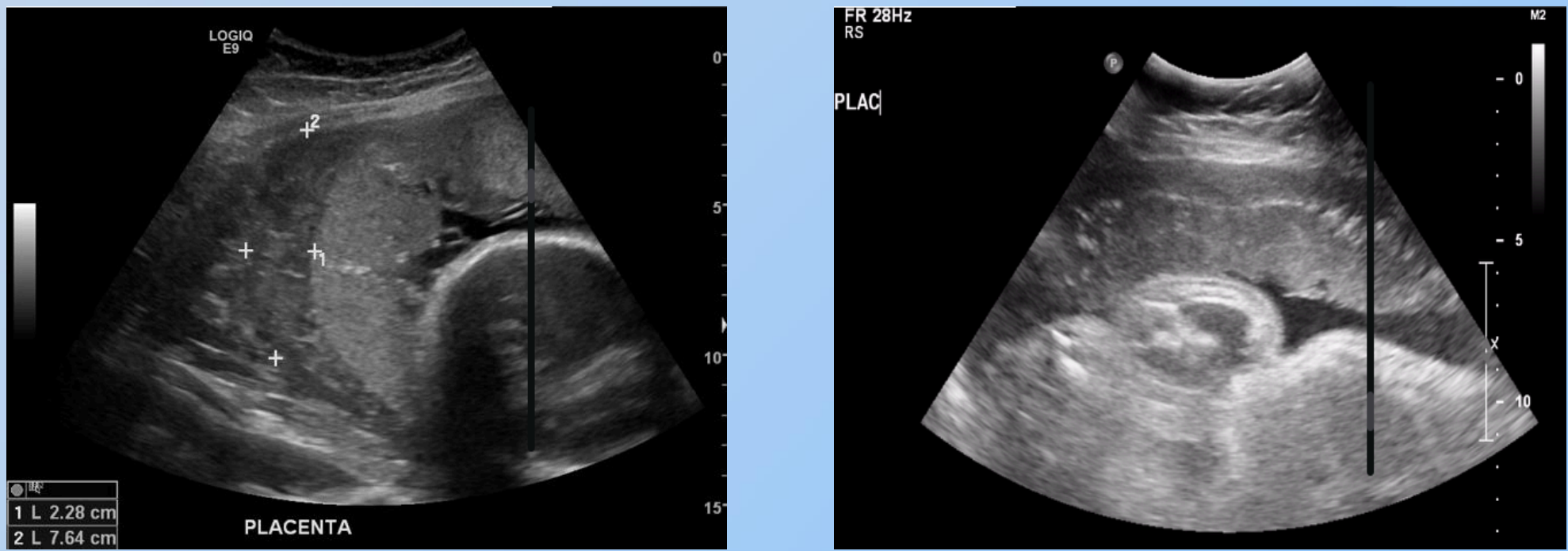


Figure 2. Ultrasound of placental abruption (Radiopedia)

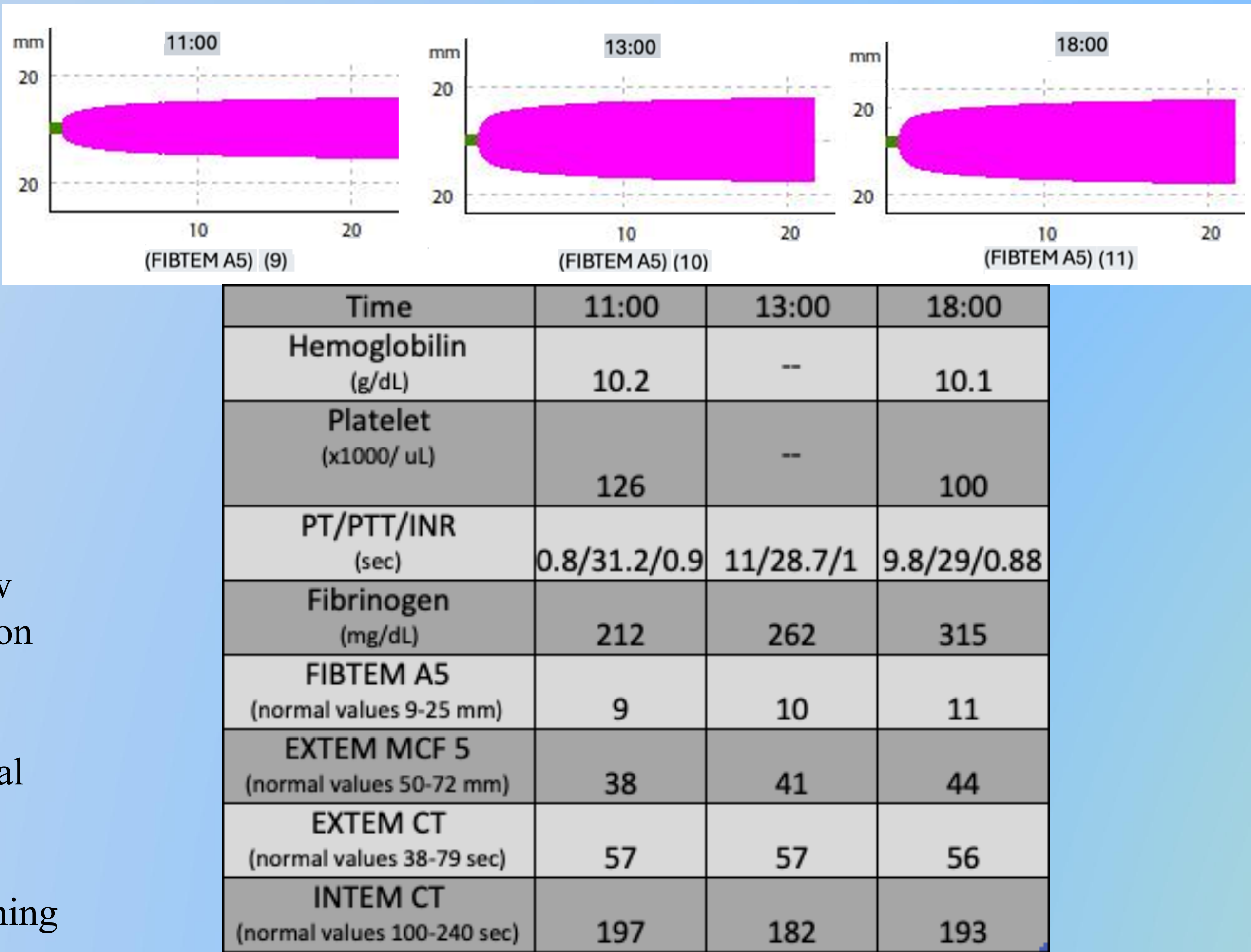


Figure 3. The resulting curve above depicts the CBC and ROTEM values over time. Each assay correlates with different coagulation studies. FIBTEM correlates with Fibrinogen levels. *EXTEM MCF 5 reflects the fibrinogen + Platelet contribution. EXTEM CT correlates with PT. INTEM CT correlates with aPTT. Normal values based on ROTEM Sigma values.

Case Report

- Successfully intubated with video laryngoscopy
- Intraoperative PPH,estimated blood loss of 2000mL. Multiple uterotonics (oxytocin, IM carboprost), IV tranexamic acid, 2.5 L crystalloid, 500mL 5% albumin, 2 units of cryoprecipitate and 1 unit blood.
- The patient delivered a viable male infant, weighing 1990g with APGARs 4/9.
- The patient was transferred to the PACU and then to the recovery floor. She was subsequently discharged on post-operative day 4, meeting all milestones.

Conclusion

- Placental abruptions are known to be associated with low fibrinogen (fibrinogen < 2 g/L), which is a good predictor of PPH.
- The availability of ROTEM and its rapid results helped our team decide the type of anesthesia to provide for the patient and prepare for the increased risk of PPH associated with hypofibrinogenemia.
- Conventional coagulation studies (i.e., PTT, PT) have long turnaround times (45–60 minutes)
- ROTEM offers real-time results within minutes (approximately 15 minutes), which allows anesthesiologists to prepare their anesthetic and resuscitative plans. Integrating ROTEM into obstetric anesthetic care improves patient outcomes by enabling swift, targeted, evidence-based interventions.

References

- Best Pract Res Clin Anaesthesiol. 2022 May;36(1):123-134.
- Br J Haematol. 2016;172(4):616-24.