A Factor of Uncertainty: Navigating Factor VII Deficiency in Obstetric Care

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Objectives

- Review Factor VII deficiency & perioperative implications
- Discuss the safety of Neuraxial anesthesia in this patient population
- Review acute treatment options for patients suffering from factor VII deficiency.
- Highlight the importance of various methods to assess coagulation

Introduction

- Factor VII (FVII) deficiency is a rare, autosomal recessive bleeding disorder with an estimated prevalence of 1 in 500,000.
- Severity is classified based on FVII activity levels: mild (20-50%), moderate (10-20%), and severe (<10%)
- FVII activity level is considered the gold standard for evaluating bleeding. However, this send-out lab, if even available, taking days to result, is not conducive to the unpredictable arrival of a laboring patient.

Case Description

- 27-year-old G4P1021 with a history of FVII deficiency and a prior cesarean delivery (CD) complicated by placental abruption in previous gestation.
- At 39 weeks and 4 days, she was admitted for non-reassuring fetal heart tones with plans for an urgent repeat CD
- Preoperative labs revealed an INR of 4.9. A plasma FVII activity level was sent at the time but was estimated to not result for 72 hours. INR utilized as a surrogate.
- Ultimately GETA for CD. Bleeding risk mitigated via Recombinant VIIa (rFVIIa) at a dose of 15 mcg/kg, 30 minutes prior to initiating GETA.
- Intraoperatively, the patient experienced a post-partum hemorrhage of 1 liter due to uterine atony and received 1 g of tranexamic acid, 1 unit of FFP, and 30 units of Pitocin. Pre and POD1 FVII resulted on **POD14 & 15** as 14% and 10% respectively.
- Overall, her postoperative recovery was uneventful. Discharged on POD2

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Neuraxial

- In the general obstetric population, the risk of spinal or epidural hematoma is approximately 0.54 per 100,000, and is likely higher in patients with a bleeding disorder.
- A target FVII activity level of >20% is recommended to ensure hemostasis (based on expert opinion).
- In the absence of specialized FVII testing, INR serves as a pragmatic yet imperfect surrogate. An INR < 1.5 has been suggested as a threshold for considering neuraxial.

Figure 1: Trend of patients INR

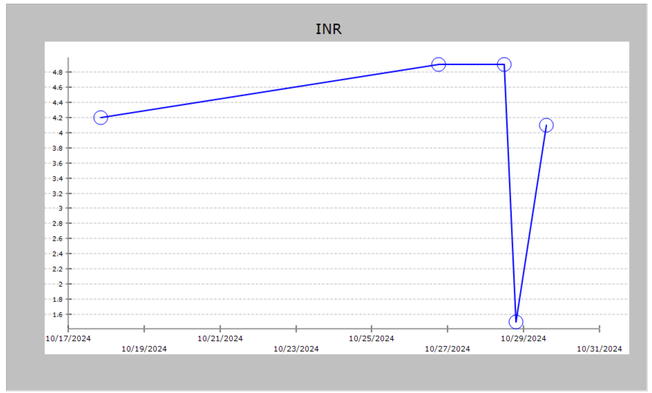
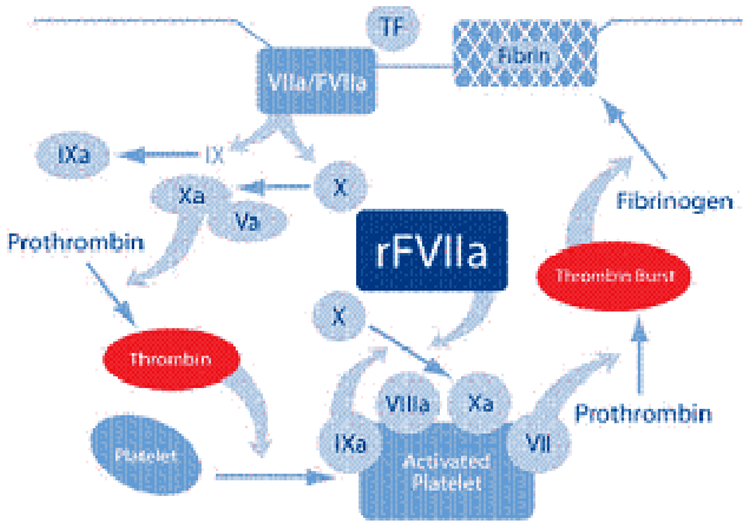


Figure 2: Graphical representation of FVIIa MOA



Recombinant FVIIa

•Recombinant Factor VIIa bypasses the need for Factor VII by **directly activating Factor X.**

•short half-life (~3 hours). Typical prophylactic dose is 15–30 µg/kg.

•Single preoperative dose + 1-2 postoperative doses are often sufficient to maintain coagulation stability.

•Regular monitoring of PT, INR & FVII activity is crucial to balance bleeding and clotting risks.

•rFVIIa is the preferred treatment due to its targeted action, quick onset, and ease of administration.

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Viscoelastic testing

- TEG provides a real-time, global assessment of coagulation, which is particularly useful in pregnancy due to the hypercoagulable state and altered coagulation factor levels.
- Traditional coagulation studies may not fully capture the functional impact of factor deficiencies, whereas TEG can provide dynamic clot formation and lysis data to guide perioperative management.

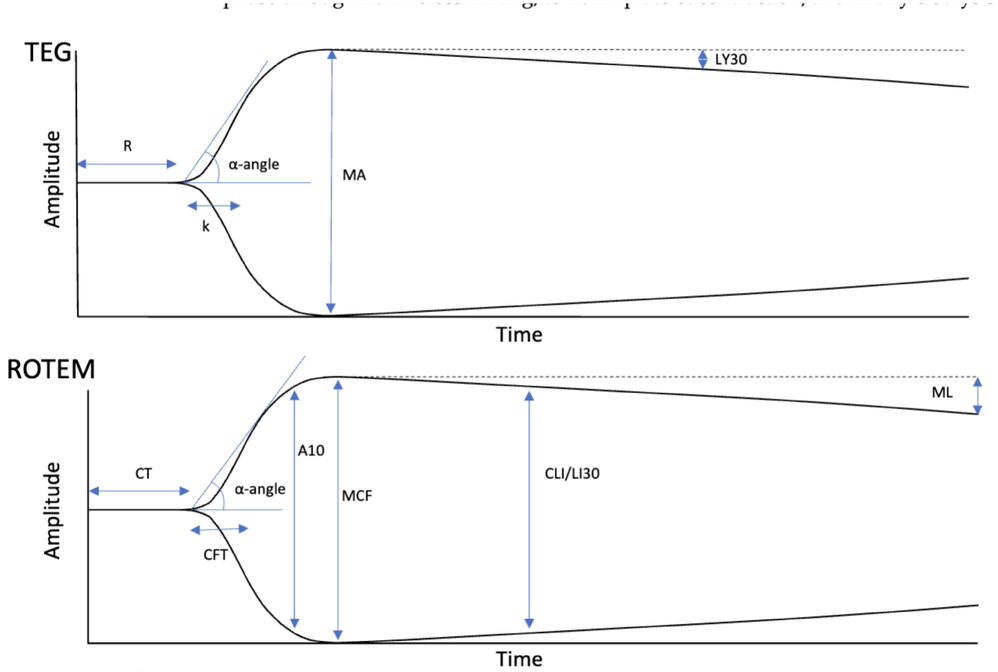

Figure 3: TEG & ROTEM example

Take Home Points

- While INR is an imperfect surrogate for FVII activity, it provided a practical solution in the absence of specialized testing.
- If FVII testing is possible, expert opinion suggests that achieving FVII activity level >20% of normal is sufficient for hemostasis.
- An alternative monitoring method for neuraxial consideration would have been viscoelastic testing.

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Figure 4: Comparision of normal TEG values pregnant vs non

Parameter	Pre-operative (Pregnant)	Non-pregnant reference range
R time (min)	7.0 (1.0–13.0)	4–8
K time (min)	2.0 (0.2–3.8)	0–4
MA (mm)	75.4 (64.6–86.2)	54–72
Alpha angle (°)	64.8 (47.6–82.0)	47–74
Ly30 (%)	1.6 (0–8.8)	0–8