

# A Call for Inclusion of the Thromboelastogram in Future ASRA Anticoagulation Guidelines

Noah LaBelle MD<sup>1</sup>, Aidan Hoie MD<sup>1</sup>, Mike Canepa MD<sup>1</sup>  
1-Department of Anesthesiology, University of Colorado School of Medicine, Aurora, CO



## Introduction

- ASRA Anticoagulation Guidelines have provided critical recommendations for safe neuraxial and peripheral nerve procedures since 2018
- These guidelines incorporate various coagulation markers, including:
  - platelet count (PLT)
  - activated partial thromboplastin time (aPTT)
  - international normalized ratio (INR)
  - anti-factor Xa levels
  - activated clotting time (ACT)
  - ecarin clotting time (ECT)
  - thrombin time (TT)
- Thromboelastogram (TEG); a dynamic test assessing clot formation, strength, and breakdown; is not currently included
- We present a case report highlighting the clinical utility of TEG in anticoagulated patients undergoing neuraxial anesthesia

## Methods

- A literature review was conducted to evaluate the role of TEG in guiding epidural placement
- The patient's course was reviewed and is presented here
- The patient's family provided verbal consent for this case report, and it was deemed exempt from IRB review per Colorado Multiple Institutional Review Board (COMIRB) policy

## Case Report

- 64-year-old male with history of ILD, mitral valve prolapse, and neuropathy underwent a bilateral orthotopic lung transplant
- POD 3: APS was consulted for epidural placement to improve pain control and respiratory function
- Coags: INR 1.8, PTT 27.6, PLT 100
- Anticoagulation: Heparin infusion for right IJ DVT
- Intervention: Heparin paused, vitamin K administered
- POD 4: INR 1.5, PTT 24.8, PLT 104.
- Due to respiratory function concerns and potential for reintubation, TEG was obtained and was within normal limits
- Epidural placed with no issue
- Patient was closely monitored throughout his hospitalization with no signs of epidural hematoma or neurologic sequelae

## Benefits of Adding TEG to ARSA Guidelines

| Aspect                                        | Traditional Coagulation Studies                                                        | Addition of TEG (Thromboelastography)                                                                                               |
|-----------------------------------------------|----------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------------------------------------------------------|
| Tests Included                                | PT, aPTT, INR, Platelet Count                                                          | TEG (R-time, K-time, Alpha angle, Maximum Amplitude (MA), LY30)                                                                     |
| Clot Formation Assessment                     | Provides basic coagulation information (clotting time, platelet count)                 | Provides a dynamic view of clot formation, strength, and stability                                                                  |
| Detection of Platelet Function                | Limited, typically assessed indirectly through platelet count                          | Directly assesses platelet function and clot strength                                                                               |
| Clotting Dynamics                             | Does not capture the dynamic nature of clotting                                        | Shows real-time clot formation and fibrinolysis                                                                                     |
| Sensitivity to Bleeding Risk                  | May miss subtle bleeding abnormalities or risk factors                                 | More sensitive in detecting early coagulation abnormalities, fibrinolysis                                                           |
| Fibrinolysis Monitoring                       | Not routinely assessed                                                                 | TEG monitors fibrinolysis with LY30, identifying excessive clot breakdown                                                           |
| Comprehensive Assessment                      | Provides a general overview of coagulation but lacks depth                             | Offers a more complete, individualized coagulation profile for patient-specific assessment                                          |
| Clinical Application for Neuraxial Anesthesia | May provide insufficient information regarding coagulation risk                        | TEG allows for better identification of clotting abnormalities or bleeding risks, improving patient safety for neuraxial anesthesia |
| Guideline Adherence (ASRA)                    | May not fully meet the comprehensive assessment required for neuraxial anesthesia risk | Adds crucial information for better adherence to ASRA guidelines, reducing risk during neuraxial anesthesia                         |

## Discussion

- Literature review: **15 studies supported** TEG as a useful tool in determining epidural appropriateness (1-15) while **2 studies refuted** its utility (16,17).
- Our case underscores the potential clinical utility of TEG in patients with borderline/conflicting traditional lab values
- Key Considerations:
  - Availability: TEG is not widely accessible, but where available, it may offer valuable insights
  - Not an Absolute Indicator: TEG should serve as an additional data point in clinical decision-making, rather than a sole determinant of procedural safety

## Conclusion

- Given the evidence and our case report, we advocate for further investigation into TEG as a tool for preprocedural assessment in neuraxial anesthesia
- While not a replacement for current ASRA-recommended tests, TEG may enhance decision-making for safe epidural placement in complex coagulopathic patients

## References

