Point of Care Thromboelestography-guided transfusion therapy in a trauma patient on a direct thrombin inhibitor

Primary Author: Robert Haughton MD
UC Davis

Co-Authors: James Littlejohn, MD, PhD;

Background
The increasing use of newer generation anticoagulants among patients presents new challenges for the anesthesia team during perioperative resuscitation of a trauma. We present a case of a patient chronically on dabigatran who presented with abdominal hemorrhage requiring resuscitation and multiple procedures for source control. This case illustrates the unique challenges the anesthesia team faced during treatment specifically: agent reversal, product management, and coagulation monitoring.

Case
A 78 year old male presented to UCDMC hypotensive and intubated after being found down at home. His past medical history was significant for atrial fibrillation for which he was chronically taking dabigatran. He was profoundly anemic with acute hemorrhage identified by emergent endoscopy. Massive transfusion protocol was initiated and the patient was given Praxbind (5g) for dabigatran reversal. The patient was taken to the OR urgently for an exploratory laparotomy in which a partial gastrectomy and splenectomy was performed with significant blood loss. A TEG was performed initially which showed a prolonged R time indicating some factor(s) deficiency but otherwise was within normal limits. Dabigatran levels were re-measured and noted to be reduced compared to at admission (216-> 35) though the INR remained prolonged at 2. Post operatively the patient remained hemodynamically unstable requiring continued MTP, pressers, and was given a single dose of FEIBA (factor II and factor Xa), as well as 3unit of cryoprecipitate. A repeated TEG showed improved though still prolonged R time, normal K time, and widened angle. Clinically the patient became more stable though he did require multiple subsequent procedures for washouts, lysis of adhesions and eventual closure of the abdomen before hemostasis was obtained.

Discussion
The perioperative management of acute bleeding continues to increase in complexity due to the introduction of new anticoagulant agents. For a period of time no reversal agent existed for these new anticoagulants and management focused on replacement of deficiencies in the coagulation pathway with products such as FFP, PCC (Factor 2,7,9,10a), recombinant factor 7a, and cryoprecipitate. Only until recently, with the introduction of idarucizumab, has anticoagulant reversal become an option (4). Though treatment now focuses on initial agent reversal, clinical hemostasis is not necessarily achieved by agent reversal alone. It remains unclear whether co-administration with PCC is needed or re-dosing of idarucizumab after 24hours is needed for for clinically significant
hemostasis (3, 5). This case serves as an example of the possibility of monitoring with point of care testing after agent reversal. TEG in addition to standard coagulation tests was utilized to direct which specific products were necessary to achieve hemostasis.

There is a growing body of evidence for the benefits of TEG in bleeding patients such as reducing the needs for blood products resulting in improved outcomes while reducing costs. Most data supporting transfusion practices is based on elective cardiac cases with limited data in acute trauma (2). In this selected case TEG allowed for directed therapy in the acutely bleeding patient thereby appropriately utilizing blood products, which has direct effect on reducing morbidity, mortality and cost. Further studies are needed to identify if TEG holds any benefit in directing transfusion therapy in acutely bleeding patients after anticoagulant reversal.