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Thromboelastography Utility: A retrospective case series of operative cranial hemorrhages

Daniel Felbaum MD; Anthony G. Conte MD; Kyle Mueller MD; Hasan R Syed MD; Rocco Armonda MD
[Medstar Washington Hospital Center]

MedStar Health

Introduction

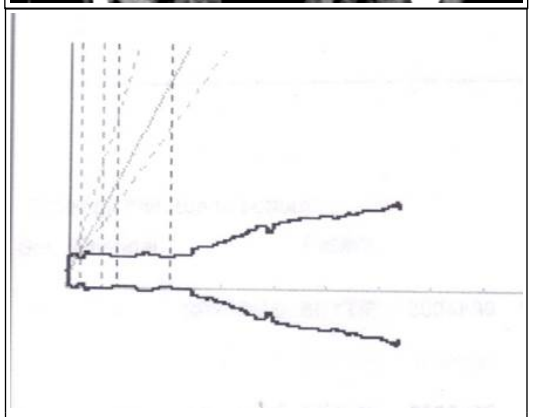
Thromboelastography (TEG) has the potential of identifying patients with coagulopathies not detected on standard assays. Although commonly used in cardiothoracic surgery, TEG has not been widespread adopted into neurosurgical practice. We present our initial operative experience for all forms of cerebral hemorrhages in patients that had abnormal TEG to aid in identifying coagulopathies.

Methods

Clinical records gathered from June 2013 to September 2014 were retrospectively reviewed for all operative interventions performed by the senior author (RAA) involving patients with cerebral hemorrhages. Standard decompressive craniotomy or hemicraniectomy with hematoma evacuation was performed on all patients secondary to acute herniation syndromes. Standard coagulation tests were analyzed and compared to thromboelastography reports to identify other potential causes of the hemorrhage.

Results

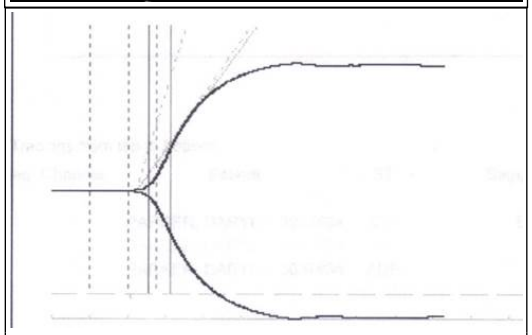
36 patients with a mean age of 59 years old were identified as having cerebral hemorrhages over a 15-month period that underwent emergency surgical intervention. 16 patients had spontaneous supratentorial intracerebral hemorrhages and 20 patients developed a hemorrhage secondary to an identifiable trauma.



TEG on Ibuprofen: R: 0.4 (5-10), K: N/A (1-3)

For the spontaneous hemorrhages, the average volume of hematoma was 55ml. Patients were only operated upon developing an acute neurological decline with herniation syndrome. For the trauma patients, all patients underwent surgery with at least 1cm of hematoma size with 5mm of midline shift. Standard tests identified coagulopathies in 4 of 36 patients.

Thromboelastography identified an additional 15 patients which prompted additional therapy or transfusion. TEGs were sensitive in exhibiting clotting dysfunction in patients that were on anti-platelet agents or patients unable to provide an accurate history.



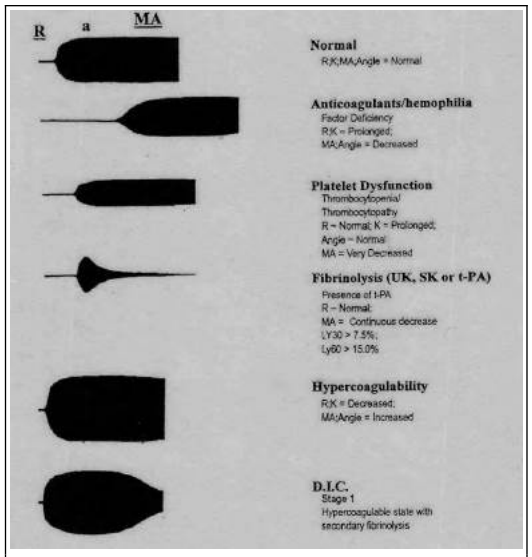
TEG on LMWH: R: 12.6 (5-10), K:3.0 (1-3)

Conclusions

Thromboelastography is an underutilized technology that may be able to affect patient outcome by identifying coagulopathies for a certain population undetected by traditional testing. In particular, thromboelastography can aid in providing a quantitative analysis for platelet dysfunction.

Learning Objectives

By the conclusion of this session, participants should be able to become familiar with the potential utility of using thromboelastography to identify patients with platelet dysfunction or coagulopathy



Depiction of normal and abnormal TEG results