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Discrepancy between Thromboelastography and Prothrombin Time

To the Editor:—The thromboelastograph, a standard monitor used during orthotopic liver transplantation and cardiopulmonary bypass,[1] is being used in other perioperative situations.[2] We present a case of the thromboelastograph being used to assess coagulation in a patient when an isolated hematologic laboratory abnormality had led to prior cancellation of surgery.

A 57-yr-old man who sustained multiple injuries in a motor vehicle accident required ventilation of his lungs and monitoring of intracranial pressure. Semielective internal fixation of the tibia and reduction of mandibular and zygomatic fractures had been postponed three times because of a prolonged prothrombin time (PT). Partial thromboplastin times, platelet count, indexes of fibrinolysis and factor concentrations (apart from a marginal decrease in factor VII) were normal, there was no evidence of liver disease, and treatment with fresh-frozen plasma (4 units) and vitamin K (10 mg) had not corrected the PT. Hematologic consultation could not explain the prolonged PT, as laboratory error, lupus anticoagulant, and factor VII inhibitors (no correction of the PT with a 1 × 1 mix) had been excluded as potential causes.

Five days after injury and 48 h after the last fresh-frozen plasma administration, we were approached to perform celite thromboelastographs with simultaneously drawn PTs of 16.6 and 17.4 s, respectively (normal range 11.1–13.1 s). Table 1 shows the thromboelastograph indexes with the short R and K times and increased α angle, indicating no *in vivo* abnormalities of coagulation factor function or platelet-fibrin interaction, and increased maximum amplitude, confirming adequate platelet function. This evidence of adequate coagulation (in the presence of the prolonged PT) was the conclusive information leading to rescheduling of surgery, which proceeded uneventfully.

Earlier application of the thromboelastograph in this patient with an isolated, unexplained, and clinically misleading PT prolongation would have prevented unnecessary postponement of surgery and may have prevented fresh-frozen plasma and vitamin K administration in the face of clinically normal hemostasis. However, because there was no thromboelastograph trace previous to the fresh-frozen plasma, influence of fresh-frozen plasma on the thromboelastograph cannot be excluded.

This report accentuates the expanding role of the thromboelastograph in perioperative coagulation assessment, especially in patients with isolated, abnormal hematologic laboratory parameters.

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Table 1. Thromboelastograph Data

	A	B	Normal
R time (s)	7.5	8.5	10–14
K time (s)	2.0	2.0	3–6
Angle (°)	78	79	54–67
Maximum amplitude (mm)	85.5	87.0	59–68

References

1. Mallett SV, Cox DJA: Thromboelastography. Br J Anaesth 1992; 69:309–13
2. Pivalizza EG, Abramson DC: Thromboelastography as a guide to platelet transfusion (letter). ANESTHESIOLOGY 1995; 82:1086

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