

## Thromboelastography: what it is and what it isn't.

### ABSTRACT

Thromboelastography was first described by Hartert in 1948. It is a global test of coagulation that records the viscoelastic changes in blood during coagulation. The thromboelastographic tracing represents the time until clot formation starts, the rate of the clot formation and the maximal clot firmness. When the recording is continued the clot will dissolve due to fibrinolysis, so the thromboelastograph also gives information on the fibrinolytic activity.

### TEST PRINCIPLE

The principle of the test is as follows. Blood is incubated in a cup in which a pin is suspended. The cup and the pin oscillate relative to each other at an angle of  $4^{\circ}45'$ . When coagulation starts fibrin is formed and fibrin strands are formed between the cup and the pin. Due to the fibrin strands the oscillating rotation of the pin and the cup are influenced. There are two instruments using a slightly different technique: thromboelastography (TEG<sup>®</sup>; Haemoscope Corporation, IL, USA) in which the cup oscillates and the rotation is transmitted to the pin; and the rotational thromboelastometry (ROTEM<sup>®</sup>; Pentapharm, Munich, Germany) in which the pin moves which detects increased impedance.

### CURRENT MONITORING

Traditionally, coagulation is monitored by global tests like APTT and PT, and the activated clotting time (ACT) for the rapid monitoring of the heparin dosage in cardiac surgery. Even though the technique of thromboelastography was described many years ago, only in recent years thromboelastography has been applied in haemostatic monitoring in espe-

cially liver transplantation and cardiac surgery. It is being introduced in operating theaters with the aim of optimizing the transfusion-based therapy and to guide the administration of antifibrinolytics. Although several retrospective audits suggest a reduction in the use of blood products after the introduction of thromboelastography, it remains uncertain whether these reductions are caused by more stringent transfusion protocols per se or by the results obtained through thromboelastography. The correlation between the results of the thromboelastography and the traditional coagulation tests is poor.

### CONCLUSION

The applicability of thromboelastography still has to be validated in well designed controlled clinical trials.



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