Hemostasis

Hemostasis is mandatory to keep a clean operative field and to prevent blood loss and postoperative hemorrhage.

Impaired haemostasis represents a major risk factor for bleeding complications in neurosurgical patients.

Haemostasis is of fundamental significance in neurosurgery, and insufficient control of bleeding is associated with morbidity and mortality. Topical haemostatic agents play an important role, as the characteristics of neuronal tissue limit the use of classical surgical haemostasis techniques. Appropriate choice of agent depends on the location and type of bleeding, but also on knowledge of the products' mechanisms of action, indications, price and accessibility. Biological products are superior to the mechanical in efficacy but require more preparation and are significantly more cost-intensive [1].

Coagulopathy commonly occurs after brain trauma and major haemorrhage or originates from antithrombotic medication. Point of care (POC) devices for bedside assessment of haemostatic parameters are increasingly used in various medical specialties. Results can be instantly implemented into treatment modalities as results are delivered within a very short period. POC coagulation testing has also shown beneficial effects in the treatment of neurosurgical patients. Identification of hyperfibrinolysis is achieved through viscoelastic testing of haemostasis and bedside coagulometry hastens the management of anticoagulated patients in need of urgent neurosurgical procedures. Results of POC testing of platelet function have been correlated with patient outcomes after traumatic brain injury and furthermore, quantification of antiplatelet medication effects on platelet activity is made possible through the use of these devices. Further studies are needed to characterise the potential of POC testing of platelet function. Antiplatelet medication plays an important role in regard to haemorrhagic and thromboembolic risks. Therefore, POC testing of platelet activity may improve treatment modalities in patients undergoing neurosurgical procedures as well as neurointerventional procedures (such as intracranial stent placement). In this article we summarise the available data of POC testing in neurosurgical patients and discuss the potential of these devices in this field. POC technologies have improved patient care in various medical fields and in our view it is likely that this will also apply to the field of neurosurgery [2].

The formation of surgical beds is unavoidable during neurosurgery, and the normal soft structure of the brain has insufficient strength to support the new vasculature. Traditionally, hemostasis had been achieved during surgery by electrical stimulation. However, this method can cause some vessels to sink into the brain tissue, making coagulation more difficult, or can liquefy the brain tissue, causing irreparable injury [3].

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