

Thesis Title Hemostatic Alteration and Platelet
Ultrastructure in Patients
Undergoing Intracranial Surgery

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ABSTRACT

Alteration of hemostatic factors: coagulation, fibrinolysis, inhibitors, platelet function and ultrastructure had been demonstrated in 14 neurosurgical patients undergoing intracranial surgery. Hyperactivity of VIII:C, vWF:Ag, IX, FPA, B-TG, PF4 and elevated whole blood platelet aggregation induced by ADP, collagen and ristocetin were already detected preoperatively while other factors were practically normal. A significant PK consumption and a slightly decreased XII were observed on the first postoperative day. Moreover, the elevated levels of IX, VIII:C, vWF:Ag and the platelet hyperactivity were more

pronounced especially on day 7 or 9. Stimulation of fibrinolysis: shortening of ECLT, reduction of plasminogen level and elevation of FDP was also presented on the first postoperative day. The active fibrinolysis was then followed by reduction of its activity on day 7 or 9. According to the operative activation of both coagulation and fibrinolysis, almost all the observed-inhibitors: AT-III, HC-II, PC, C₁-INH, α -₂AP, α -₂M and HRG were therefore consumed immediately after operation. Consequently, the inhibitors levels were then increased when the activation effects declined on day 7 or 9.

Comparative results of the five anticoagulated cases (who got or had high risk of postoperative thrombosis: four female meningioma and the thrombotic patients) and the remainders showed that there were quantitative differences in the response between the two groups. Analyzed data of the anticoagulated group suggest factors VII, IX, X, VIII, PK, FPA, B-TG, PF4, ECLT, FDP and spontaneous platelet aggregation as predictive variables of postoperative thrombosis.

Results of the three subgroups: meningioma, tumors of neuroepithelial tissue and vascular defect groups showed that hemostatic alteration of the meningioma patients had higher tendency to develop thrombosis than those of other

patients. They had active clotting activities but slow fibrinolysis immediately after operation.

Platelet electron micrographs illustrated several surgical induced ultrastructural changes: irregular plasma membrane, surface protrusion, pseudopodia, a multilamella appearance peripheralization of secretory granules and centralization of their organelles. These were morphological evidences involving platelet secretion. Morphometric studies of the platelets demonstrated that there were postoperative reduction of α -granule per platelet section and dilation of open canalicular system. Platelet had more discoidal profile and contained large diameter granules postoperatively.