Free Flap Transfer Surgery: Role of Thrombogenetic Factors

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Introduction. Free flap transfer has become a routine surgery to close tissue defects. Microvascular thrombosis leading to possible flap loss still remains a serious threat; it can occur due to external or intrinsic thrombogenic factors, such as hypercoagulability.

Aim. The aim of the study is to detect preoperative thrombogenic factors in order to prevent possible free flap thrombosis and to improve surgical outcome.

Material and Methods. In the prospective observational study were enrolled 34 patients who underwent microvascular free flap surgery in the Latvian Centre of Reconstructive and Microsurgery. Demographical data and external thrombogenic factors such as comorbidities, previous thrombosis, history of trauma and smoking were recorded.

Preoperatively, rotational thromboelastometry (ROTEM®) was performed to assess coagulation status in parallel with routine coagulation tests (APTT, prothrombin ratio, fibrinogen, platelets). Postoperatively, free flap thrombosis, reexplorations and surgical outcome were recorded.

Results. 34 patients with mean age 38 ± 11 years undergoing free flap surgery mainly because of traumatic tissue injury were included in the study. Hypercoagulability by ROTEM was found in 8 (23%) patients mainly detected by MCF_{EXTEM} and MCF_{FIBTEM} with mean values 75 ± 5 and 34.7 ± 3 mm, respectively. Alongside, increased plasma fibrinogen level 5.2 ± 0.9 g/L was found in 7, but thrombocytosis in 5 hypercoagulable patients. Positive non-significant correlation was observed between plasma fibrinogen level and MCF_{FIBTEM} ($r = 0.517$, $p = 0.154$), moderate positive non-significant correlation was found between thrombocytosis and MCF_{EXTEM} ($r = 0.695$, $p = 0.056$). External thrombogenic factors such as surgery within 1 month after trauma were observed in 10 patients (with hypercoagulable ROTEM values in 5 cases), history of arterial thrombosis in 4, smoking history in 7, and tetraparesis in 1 case from the entire study group. Re-exploration was performed to 6 patients due to early flap thrombosis. In 4 out of 6 cases at least one thrombogenic factor was identified, most frequently hypercoagulability by ROTEM. In 31 cases microsurgical flaps survived.

Conclusion. According to the first data obtained, hypercoagulability detected by ROTEM, high plasma fibrinogen level in combination with external thrombogenic factors can affect free flap survival. Thus, preoperative identification of thrombogenic factors can improve surgical outcome.