

Critical Time for Neovascularization/Angiogenesis to Allow Free Flap Survival after Anastomotic Thrombosis without Surgical Intervention

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INTRODUCTION: The minimal postoperative time required for neovascularization/angiogenesis to occur that may allow free flap survival after occlusion of the microsurgical anastomoses or ligation of the vascular pedicle without surgical intervention is unknown.

MATERIALS AND METHODS: All reports describing free flap survival after postoperative vascular occlusion, including thrombosis and ligation, without revision of the microsurgical anastomoses were reviewed. The type of flap, recipient site, vessel of occlusion, postoperative occlusion day, and non-surgical treatment were analyzed.

RESULTS: 19 reports (24 flaps) detailed 11 arterial, 5 venous, and 8 simultaneous arterial and venous (vascular pedicle) occlusions (thromboses and ligations) in 11 head and neck, 9 lower extremity, 1 breast, and 2 upper extremity free tissue transfers. 9 flaps survived without any intervention, 6 survived with conservative therapy (anticoagulation or leeches), and 9 survived despite pedicle ligation. The range of critical day of occlusion did not differ significantly among vessel types. 75% of arterial thromboses and ligations occurred between 6 and 14.5 days. 75% of vascular pedicle thromboses and ligations occurred between 8.5 and 18.5 days. When compared to jejunal flaps, skin flaps survived after earlier postoperative occlusion. (20.8 vs. 10.5 days; p-value 0.01).

CONCLUSION: This analysis suggests that free flaps compromised by vascular thrombosis or pedicle ligation may survive only with conservative therapy when the event occurs after a minimal critical time period. Flap survival is more probable when arterial occlusion or pedicle ligation occurs after postoperative day 11, but this minimal critical period may be as low as 6 days for arterial occlusion.