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Hemoglobin oxygenation of venous-perfused forearm flaps.

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To understand how venous flaps function we investigated whether blood flowing via the venous network reaches the capillaries of the skin. While measuring spectrophotometrically intracapillary hemoglobin oxygenation of fasciocutaneous forearm flaps in 12 patients, flap perfusion was changed by manipulating nutrient vessels. Conventionally perfused radial forearm flaps had an intracapillary hemoglobin oxygenation of 51% to 74% but decreased to 6.9% to 12.2% within 90 to 120 minutes after arterial occlusion and perfusion only from the cephalic vein entering the flap cranially (type I venous flap). Radial forearm flaps without any vascular connection showed no oxygenated hemoglobin after 180 to 240 minutes in the capillary network. After microsurgical vein anastomosis and release of the blood flow only via the cephalic or accompanying veins, hemoglobin oxygenation returned immediately to about 10%. We conclude from our results that there is actual capillary perfusion, albeit very slight, in type I venous forearm island flaps.

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