Does One or Two Vein Outflow Effect Outcomes in Head & Neck Microsurgery? Revisiting an Old Argument by Analyzing 317 Consecutive Free Tissue Transfers

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Abstract

Background: Vascular compromise after microvascular head and neck reconstruction is rare. When it does occur, venous problems are most likely to blame. The benefit of utilizing one versus two veins for outflow is debatable in the literature[1-9]. We hypothesize that performing dual vein outflow improves flap viability and reduces peri-operative complications in head and neck microvascular reconstruction.

Methods: A retrospective chart review was performed. All subjects who underwent head and neck microvascular reconstruction at the University of Kansas Medical Center between January 2004 and December 2012 were included. Outcomes of flaps utilizing one and two vein outflow were compared. First, peri-operative vascular compromise was compared between the two groups. Secondly, flap complications including hematoma, wound healing problems/dehiscence/fistula, and partial or complete flap failure were compared. A Chi-square test was used to compare both groups.

Results: In this study, 309 subjects underwent a total of 317 microvascular free flap reconstructions of the head and neck. 213 of the 317 (67.2%) flaps utilized one vein outflow and 104 (32.8%) employed dual vein outflow. 57 of 317 (18%) flaps required urgent exploration for peri-operative vascular compromise. Of these 57 flaps, 41 (71.9%) had only one venous anastomosis while 16 (28.1%) had two venous anastomoses. Venous congestion was the reason for urgent exploration in 37 of the 57 (64.9%) subjects. 30 of the 37 (81.1%) flaps with venous congestion had one vein anastomosis and 7 of the 37 (18.9%) had dual vein outflow ($p = 0.03$). The incidence of flap complications included 38 of 213 (17.8%) in the single vein group and 15 of 104 (14.4%) in the group utilizing dual venous outflow ($p = 0.44$). The overall flap success rate was 303 out of 317 (95.6%) flaps. Interestingly, 12 of 14 (85.7%) flap failures had a single vein anastomosis while 2 of 14 (14.3%) flap failures utilized a dual vein outflow ($p = 0.15$).

Complication	**Single venous anastomosis (*n* of 213, %)**	**Dual venous anastomoses (*n* of 104, %)**
Hematoma	19 (8.9)	5 (4.8)
Venous congestion	30 (14.1)	7 (6.7)
Arterial insufficiency	8 (3.8)	3 (2.9)
Infection	2 (0.9)	3 (2.9)
Wound dehiscence and fistula	5 (2.3)	5 (4.8)
Flap loss (partial or total)	12 (5.6)	2 (1.9)
Total (%)	38 (17.8)	15 (14.4)

Conclusion: Our experience demonstrates a statistically significant decrease in re-exploration for venous congestion when dual vein outflow is utilized compared with single vein anastomosis. The incidence of overall flap complications and flap failure was lower although not significant when dual vein outflow was utilized. Based on these findings, when feasible, coapting two veins should be considered in any head and neck microvascular reconstruction.

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