

Publication Brief

Is Intra-operative Blood Flow Predictive for Early Failure of Radiocephalic Arteriovenous Fistula?

Objective

Prospective study designed to investigate the predictive value of intra-operative blood flow on early failure of primary radiocephalic arteriovenous fistulas (RCAVF) before the first effective dialysis

Study

Autogenous RCAVFs in 58 patients were followed for an average of 30 days.

Results

- Thrombosis occurred in eight patients(14%) and non-maturation in four (7%) patients.
- Intraoperative blood flow in functioning RCAVFs was significantly higher compared to non-functioning: RCAVFs (230 vs 98 mL/min; P = 0.007).
- Blood flow volume measurements with a cut-off value of 120 mL/min had a sensitivity of 67%, a specificity of 75%, and a positive predictive value of 91%.

Thresholds (mL/min) to predict Fistula Maturation: Comparison of Studies						
AV Fistulas	Berman 2008 ²	Johnson 1998 ³	Won 2000 ⁴	Lin 2008 ⁵	Ross ~ 2003 ⁶	Saucy 2009 ¹
Radio-cephalic	> 140 (n = 21)	> 170 (n = 94)	> 160 (n = 50)	> 200 (n = 109)	> 250 - 300	> 120 (n = 58)
Brachio-cephalic	> 308 (n = 49)	> 280 (n = 128)			> 200	

Conclusions

Blood flow <120 mL/min has a good predictive value for early failure in RCAVF. During the procedure, this cut-off value may be used to select which RCAVF should be investigated in the operation theatre in order to correct any abnormality in real time.

Take Home Points

- This Swiss study corroborates other studies shown in the table above. It sends a clear message that measuring blood flow intraoperatively at the time of fistula creation can be a valuable predictor of probability of fistula maturation (see table above).^{2,3,4,5,6}
- Twenty to thirty percent of all AV fistulas fail to mature to be functional accesses for dialysis. When a fistula can not be used, valuable time is lost and patient quality of life is improved.
- The study sets 120 mL/min as the minimal flow to predict maturation of a radiocephalic fistula, lower than other published studies.

References

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- 2 Berman SS et al, "Predicting Arteriovenous Fistula Maturation with Intraoperative Blood Flow Measurements," The Journal of Vascular Access 2008; 9: 241-247. (Transonic Reference # 7710AH)
- 3 Johnson CP et al, "Prognostic Value of Intraoperative Blood Flow Measurements in Vascular Access Surgery," Surgery 1998; 124: 729-38. (Transonic Reference # 1504AH)
- 4 Won T et al, "Effects of Intraoperative Blood Flow on The Early Patency of Radiocephalic Fistulas," Ann Vasc Surg 2000; 14(5) 468-72. (Transonic Reference # 2411AH)
- 5 Lin CH et al, "Correlation of Intraoperative Blood Flow Measurement with Autogenous Arteriovenous Fistula Outcome." J Vasc Surg. 2008 (Transonic Reference # 7637AH)
- 6 Ross J, unpublished data.