Publication Brief

Clinical Performance Characteristics of Hemodialysis Graft Monitoring

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BACKGROUND
The authors examine using venous pressure monitoring and access flow measurements as a basis for identifying access failure and for clinical decision making.

STUDY
- 71 PTFE grafts from hemodialysis patients at 3 dialysis clinics
- Graft flow was averaged from two graft flow measurements.
- Venous pressures were measured at pump speeds of 0, 200, and 400 mL/min during the first hour of dialysis.
- Follow-up occurred over a one-year period after evaluation.
- Failure was defined as graft stenosis requiring angioplasty, surgical revision, or clotting. No specific protocol was in place for maintaining access patency. Clinical parameters indicating angioplasty included difficulty in cannulation, excessive bleeding after needle withdrawal, or clotting of the access.

RESULTS
- The average initial graft flow was 900 mL/min.
- 38 patients had 41 clots requiring intervention during the year.
- Graft flows differed significantly between failed and patent grafts.
- ROC curves data analysis (predicted graft failures and false positives plotted against threshold flows) showed that single graft flows were not useful in clinical decision making.

CONCLUSION/DISCUSSION
Venous pressures were not indicative of access failure. The National Kidney Foundation’s KDOQI Guidelines recommend monthly flow access surveillance. ROC curves from this study show higher correlation between flow measurement and graft failures in the first thirty days after the flow measurements, than for longer time periods. Furthermore, KDOQI Guidelines suggest angiography for hemodialysis patients with access flows below 600 mL/min or access flows below 1000 mL/min that have decreased 25% within a four month period. The investigators tried to predict graft thrombosis for a twelve-month period based on one access flow measurement at the onset of the study. It is accepted that grafts without maintenance will generally clot within six to twelve months. Taking an access flow measurement prior to this period of observation, with no access patency protocol available, will obviously have little effect on the outcome of AV grafts without maintenance.

Reference: