Percutanous Interventions on the HeRO Device: etiologies for graft dysfunction

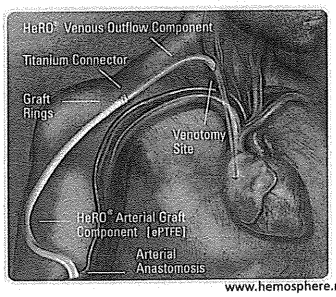
Adam Grezaffi M.D.
Duke University
Fellow, Division of Vascular and Interventional radiology
March 30, 2011

Co-authors: S. Gage, J. Bryant, M. Lessne, M. Miller, J. Lawson, T. Smith, C. Kim

HeRO Device

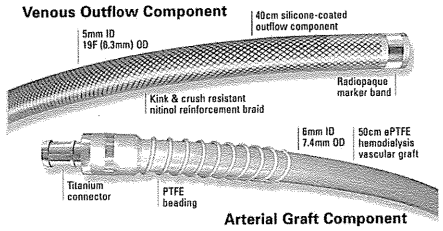
- Hemodialysis Reliable Outflow (HeRO) Vascular Access Device (Hemosphere Inc, Minneapolis, Minn)
- FDA approved for use in patients with end stage renal disease who have exhausted all peripheral venous access.
  - Central venous pathology
  - No adequate vein for AVG/AVF

HeRO Device



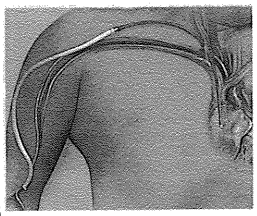
www.hemosphere.net

HeRO components



AV graft dysfunction

- Venous anastomosis stenosis: #1 cause
- HeRO device: anastomosed to artery
- Outflow connected to 19F catheter: tip in RA
- No venous anastomosis
- What causes dysfunction?



Purpose

- To evaluate the etiology of thrombosed and abnormally functioning HeRO devices

Materials and Methods

- 50 patients underwent surgical HeRO device insertion between 02/06-10/10.
  - Avg. age 55.8 (33-83)
- 25 different grafts referred for percutaneous intervention
- Total of 60 declots and 8 shuntograms during this time period.

Results

- First time thrombosis or dysfunction occurred on avg. 170 days (range 15-470 days)
- Median of 3 interventions per graft for a total of 68
- Technical success rate at restoring function was 100%.

Results

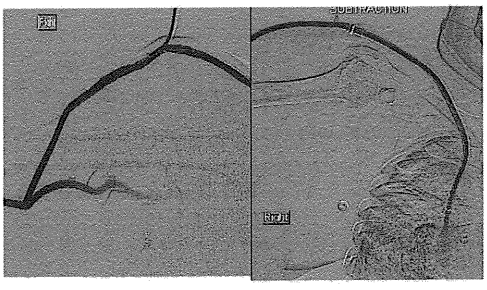
Location of stenosis	# unique grafts affected	Total # Interventions
Intragraft	20 (80%)	38
- Venous limb	8	25
- Peri-coupler	6	7
- Mid-graft	3	3
- Arterial limb	3	3
Arterial anastomosis	6 (30%)	11
Native artery	2 (4%)	2
No lesion identified	11 (44%)	15

25 intervened upon HeRO's, 68 interventions

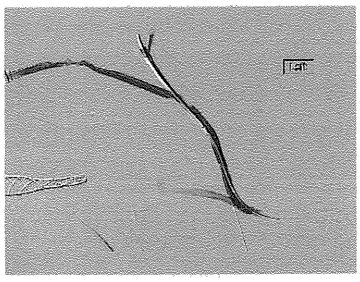
Results

- Uncommon causes included:
  - Fibrin sheath
  - Kinking of the venous limb of the graft
  - Catheter side-walled
  - Azygous stenosis.

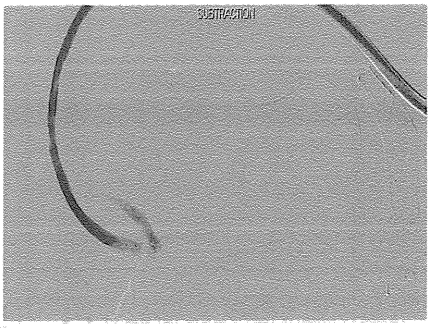
Normal



Venous limb

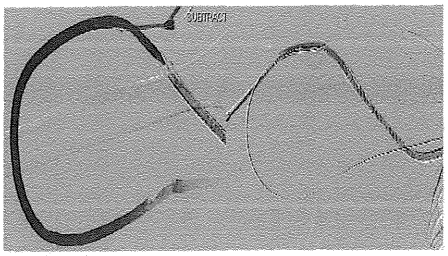


Arterial Anastomosis



Duke IR

Peri-coupler Stenosis

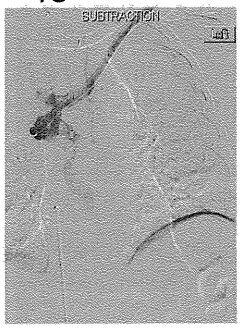


Duke IR

Side-Walled

Duke IR

Azygous Stenosis



Duke IR

HeRO Graft

- Conclusion:
  - Most common cause of HeRO graft thrombosis or dysfunction was an intragraft stenosis.
  - Percutaneous interventions were highly successful at restoring function.

Duke IR