

Collaboration between Radiology and Surgery to Optimize Care

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Disclosures

- Consultant : Medtronic, Bard, Galvani

Ingredients for collaboration

- Shared passion for HD
- Requires two-way interest
- Focus on optimizing patient outcomes

Key points for collaboration: IR-> VS

- Venous anastomosis stenosis refractory to angioplasty
 - discuss stent vs revision
 - Revision often needed very soon due to imminent thrombosis



Key points for collaboration: IR-> VS

- Early graft infection
 - Erythema, tenderness, F/C
 - Impending sepsis
 - Urgent referral to VS to consider excision
 - Avoid intervention – CVC
 - Consider ER or direct admission if overt



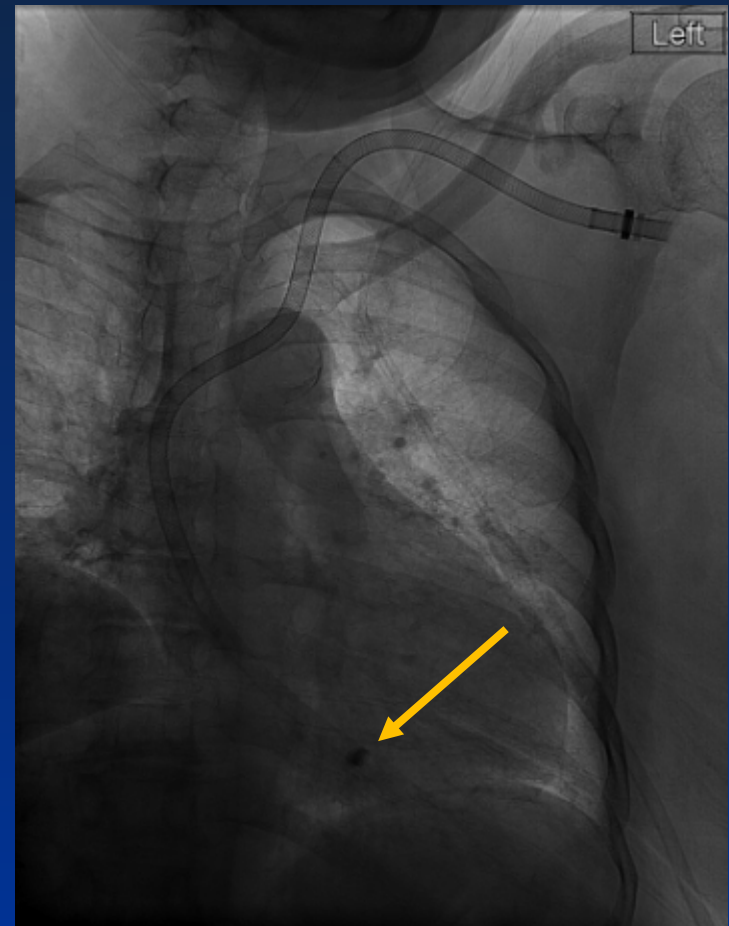
Key points for collaboration: IR-> VS

- Pseudoaneurysms
 - Impending rupture
 - Rapidly enlarging, scab or markedly thinned at apex
 - Stent graft suboptimal long term – 42% infxn risk
 - (OK to temporize)
 - VS to consider revision



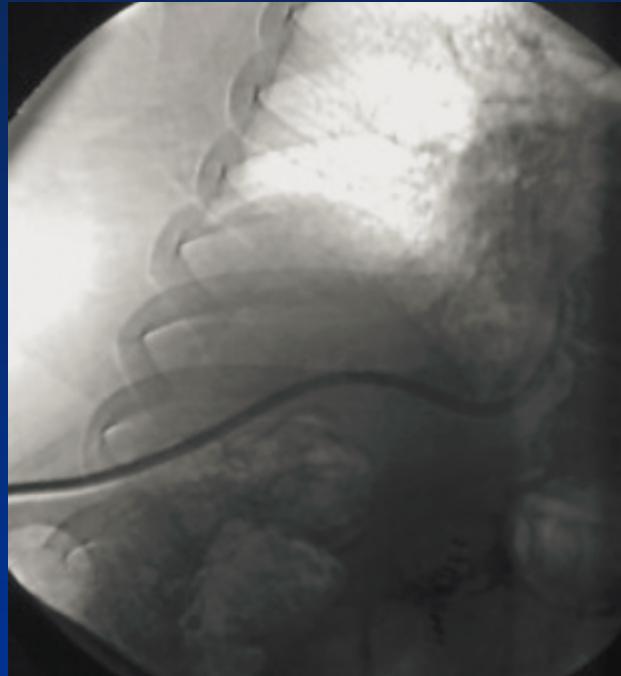
Key points for collaboration: IR-> VS

- Technical problems with graft
 - Kink
 - HeRO tip position
 - Exposed graft
- Early/recurrent thrombosis
- Expected poor outcome
- VS to consider revision

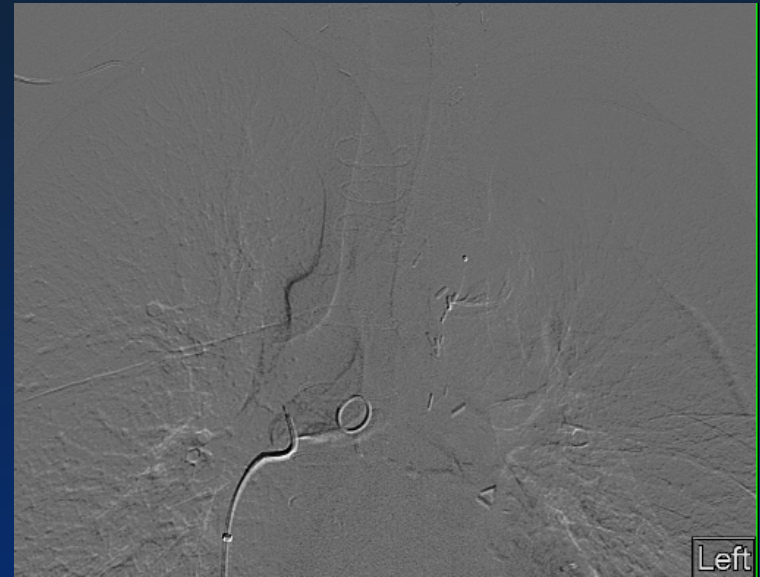


Key points for collaboration: IR-> VS

- Patient living on CVC
 - Femoral, translumbar, transhepatic
 - Consider recanalization / HeRO

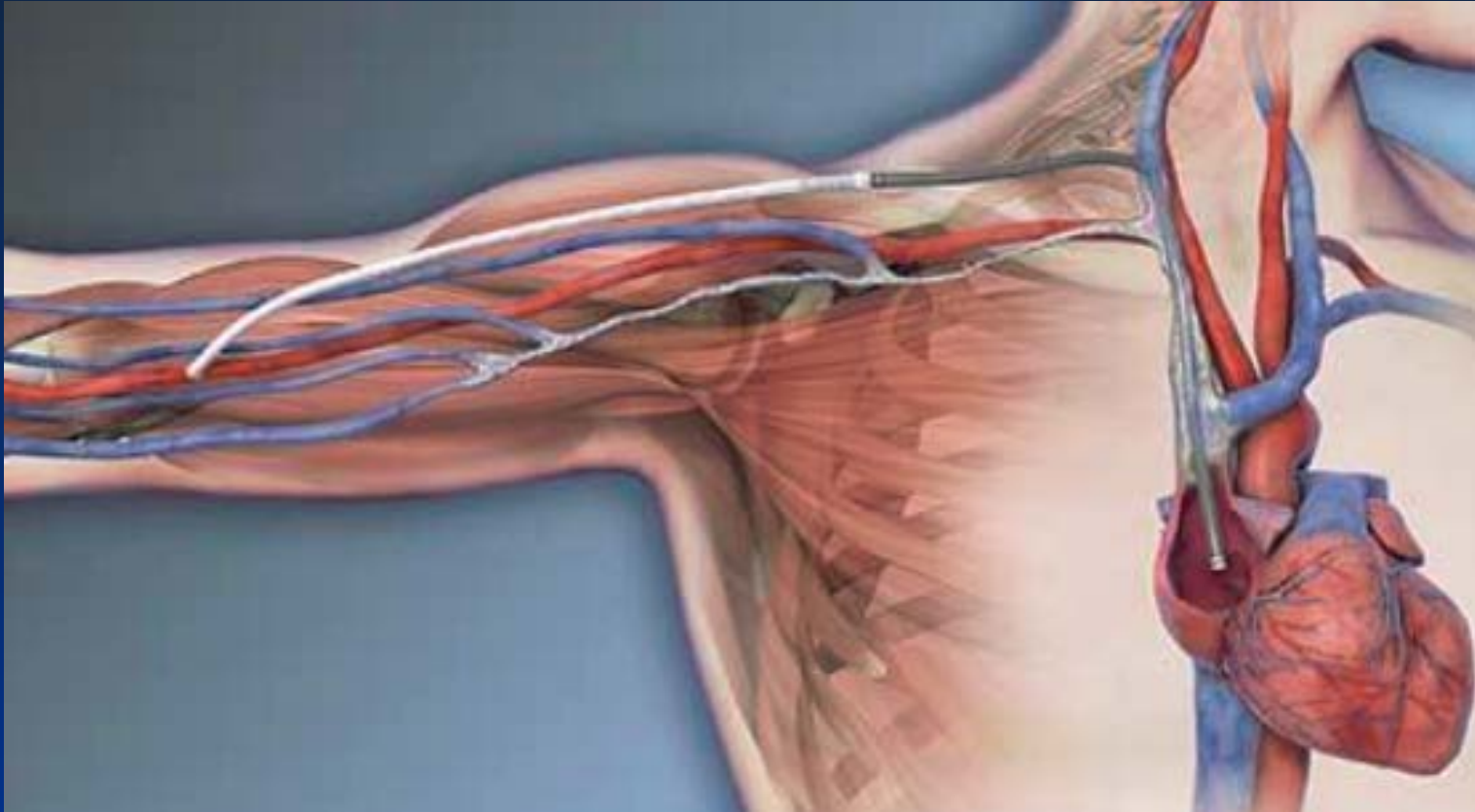


End-stage ESRD



- Nontraditional CVC
 - Femoral
 - Translumbar
 - Transhepatic
- Hospice?

HeRO: Hemodialysis Reliable Outflow



Catheter-dependent or approaching catheter dependency due to central vein stenosis/occlusion. Failing fistulas or grafts due to central venous stenosis

HeRO vs AVG vs CVC

	HeRO	AVG	CVC
1-yr primary patency	35%	31%	36%
1-yr secondary patency	68%	55%	37%
Intervention rate per year	2.2	1.6	5.8
Infection rate per 1000 d	0.13	0.21	2.3

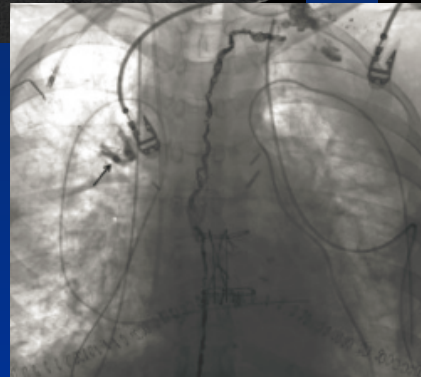
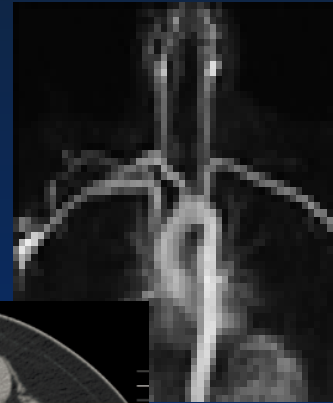
Nassar GM et al. A comparison between the HeRO graft and conventional arteriovenous grafts in hemodialysis patients. Semin Dial. 2014; 27:310-8.
Katzman HE et al. Initial experience and outcome of a new hemodialysis access device for catheter-dependent patients. J Vasc Surg. 2009; 50: 600–607
Gage SM et al. Multi-center Experience of 164 Consecutive Hemodialysis Reliable Outflow [HeRO] Graft Implants for Hemodialysis Treatment. Eur J Vasc Endovasc Surg. 2012 Jul;44(1):93-9.

HeRO Insertion: central vein occlusion

- Step 1: Guidewire access to RA
- Single surgery by VS
 - Skillset/experience with recanalization?
 - Time required
 - OR costs
 - Adequate devices?
 - Failed recanalization?

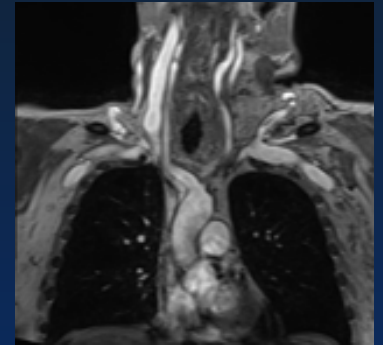
Interventional radiology

- Radiologic imaging
- Percutaneous procedures
- Recanalization
 - Veins
 - Arteries
 - Bile ducts
 - Ureters
- Devices



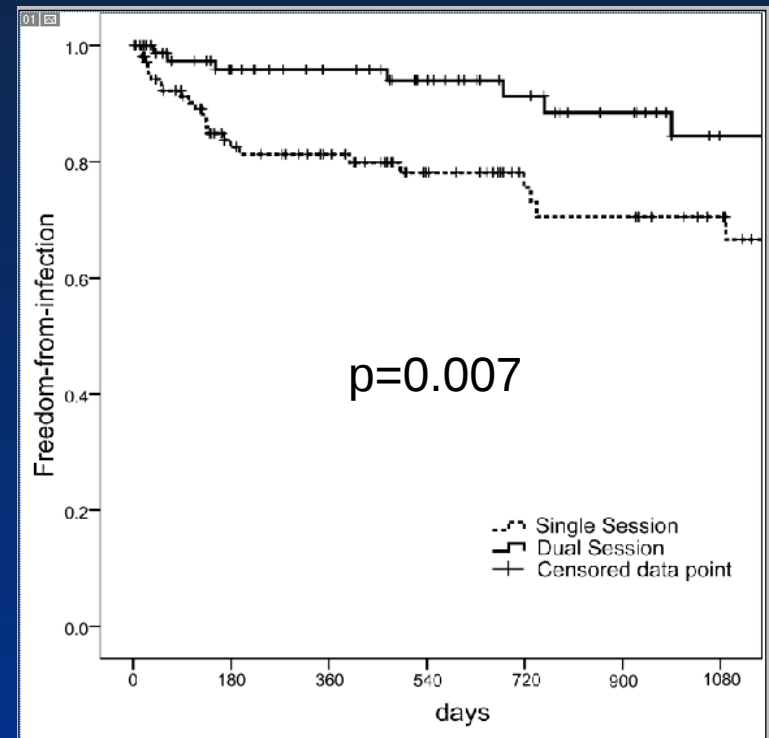
HeRO Insertion: two-stage procedure

- Stage 1 (IR)
 - Advanced imaging (CTV/MRV)
 - Perform central venous recanalization (or transmediastinal)
 - Insert tunneled CVC
- Interval days to months
- Stage 2 (OR)
 - Cut down on catheter to achieve guidewire access to atrium
 - Insert HeRO graft



Infection risk with two-stage?

- 192 patients received HeRO graft
 - 105 single session (OR)
 - 87 dual session (IR+OR)
- Infection within 90d
 - Single session: 8.6%
 - Dual session: 2.3%



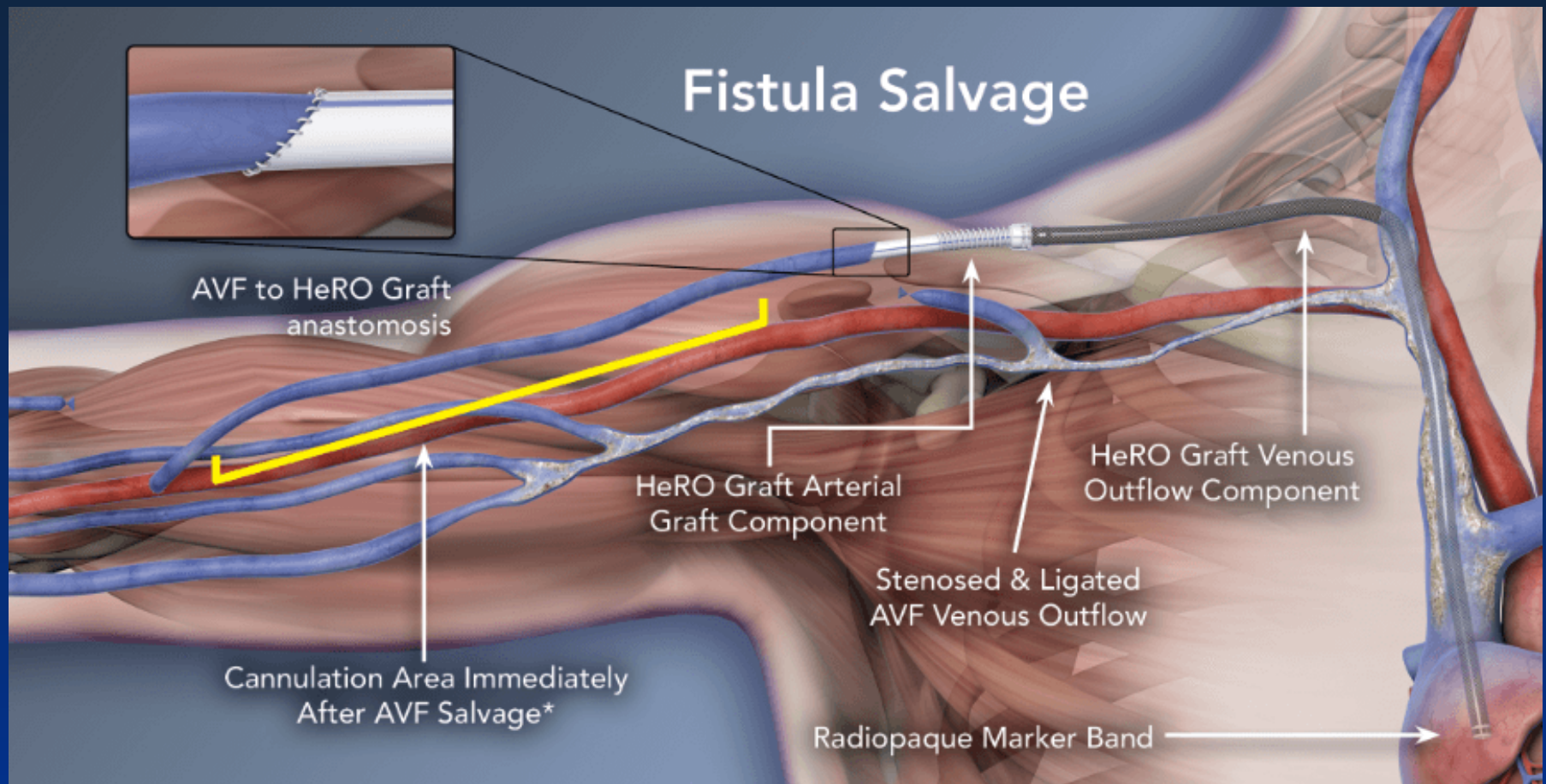
Griffin AS, Gage SM, Lawson JH, Kim CY. Early infection risk with primary versus staged Hemodialysis Reliable Outflow (HeRO) graft implantation. J Vasc Surg. 2017 Jan;65(1):136-141

Endovascular mgmt central vein stenosis with HD access

- Traditional management – relatively poor patency rates in the literature
 - Angioplasty – 6 month primary patency 23-63%
 - Stenting – 6 month primary patency 14-73%
 - Access ligation



HeRO for fistula/graft salvage w/ CVS



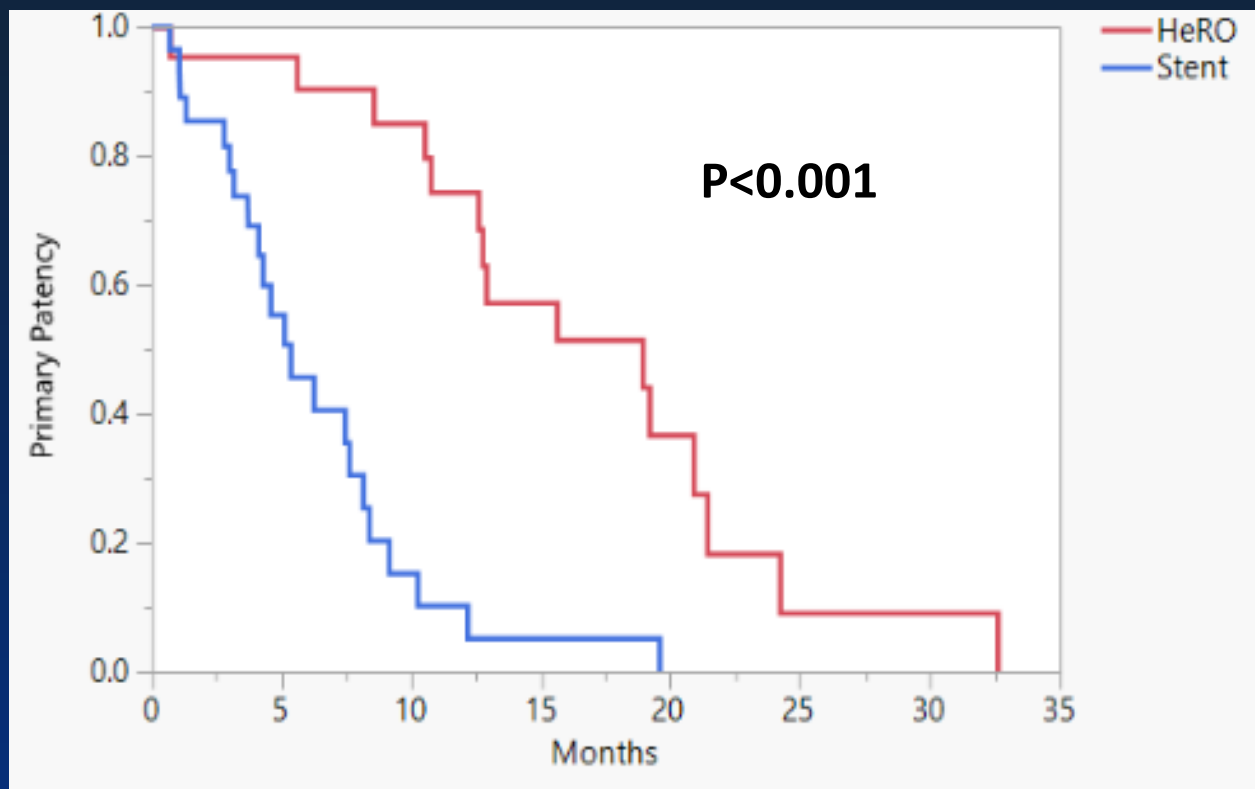
Stent vs HeRO

- 51 patients with severe arm swelling due to AV access ipsilateral to central vein stenosis/occlusion
 - 28 underwent stent deployment
 - 23 underwent HeRO conversion

	HeRO	Stent	p-value
Percent Swelling Improved	95%	86%	0.55
Percent Swelling Resolved	61%	47%	1.00

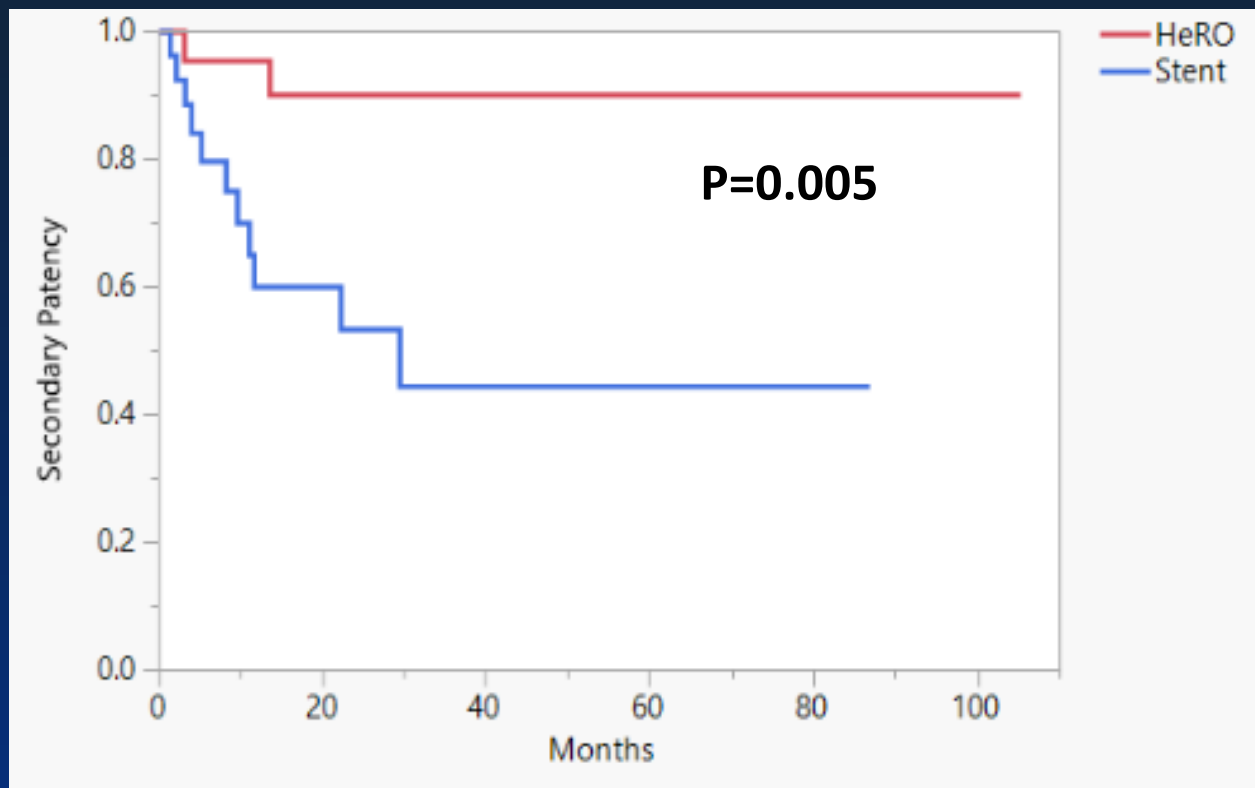
Cline B, Griffin A, Gage S, Lawson J, Dillavou E, Kim CY. Severe arm swelling in hemodialysis patients with AV access and ipsilateral central vein stenosis: comparison of stent deployment versus conversion to a HeRO graft. SIR 2018

Stent vs HeRO



	Months	HeRO	Stent
Primary Patency	6	78%	29%
	12	57%	7%
	24	9%	0%

Stent vs HeRO



	Months	HeRO	Stent
Secondary Patency	6	91%	61%
	12	74%	43%
	24	43%	25%

Summary

- End-stage ESRD pts often have
 - Long term CVC
 - Higher rate of emergencies
 - Hospice/early mortality
- Collaboration vital for optimizing access in end-stage ESRD pts
 - Permanent access via HeRO likely under-used

Thank you

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