

# Radiofrequency Guidewire Assisted Central Venous Occlusion Recanalization for Symptomatic Superior Vena Cava Syndrome in Two Dialysis Access Patients

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# Disclosures

- None



# Patient #1 Case Background

- 57-year-old female with ESRD from IgA Nephropathy on HD via Right Brachiocephalic AVF complicated by Right Facial/Arm swelling that developed 13 months post-procedure
  - MedHx: IgA Nephropathy, Hypertension, Mitral Valve Endocarditis, MRSA Bacteremia, Left IJ Tunneled Dialysis Catheter Infection
  - SurgHx: Peritoneal Dialysis Catheter Insertion/Removal, Left IJ Tunneled Dialysis Catheter Insertion/Removal, Right Brachiocephalic AVF, Mitral Valve Replacement
  - Physical Exam Findings – Right Hemiface/Chest/Arm fullness and collateral veins present



# Superior Vena Cava Occlusion



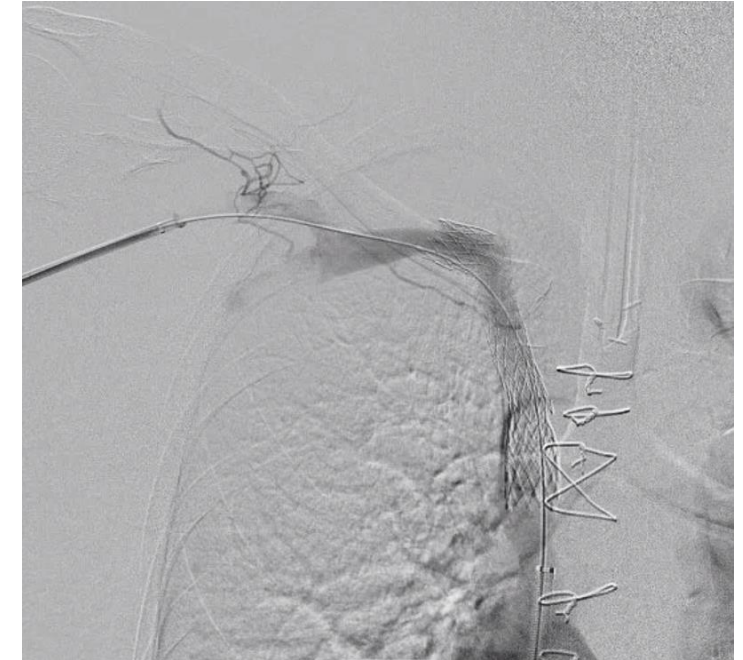
# Endovascular Intervention – RF Wire



**Crossing Lesion with PowerWire  
Establish Throughwire from Femoral**



**Angioplasty over Throughwire**



**Stenting with Completion  
Angiogram**



# Patient #1 Post-Operative Course

- Discharged home post-procedure
- Marked improvement in patient's symptoms with resultant decrease in swelling and prominence of venous collaterals



# Patient #2 Case Background

- 31-year-old female with ESRD from SLE on HD via Left Brachiobasilic AVF complicated by Left Face, Neck, Breast, and Arm Swelling 4 months post-operation
  - MedHx: SLE, Lupus Nephritis, Shrinking Lung Syndrome, Pericardial Effusion, Pulmonary Hypertension, Hypertension
  - SurgHx: Right IJ Tunneled Catheter, Brachiocephalic AVF
- Physical Examination Findings: Left hemiface/breast/chest fullness, left arm pitting edema

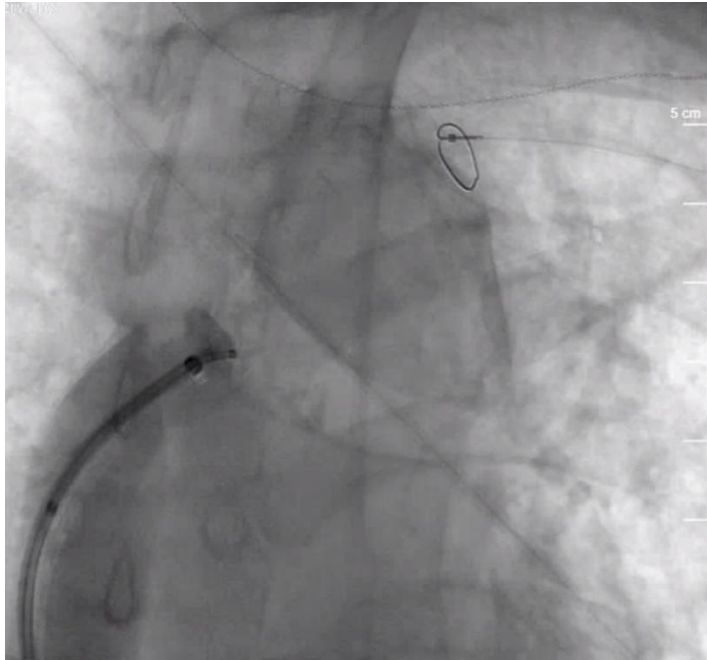


# Left Innominate Vein Occlusion

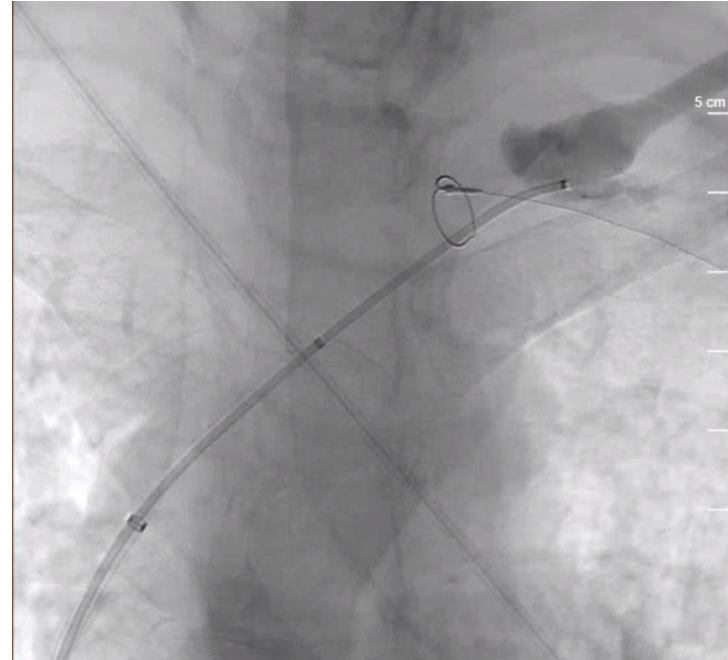




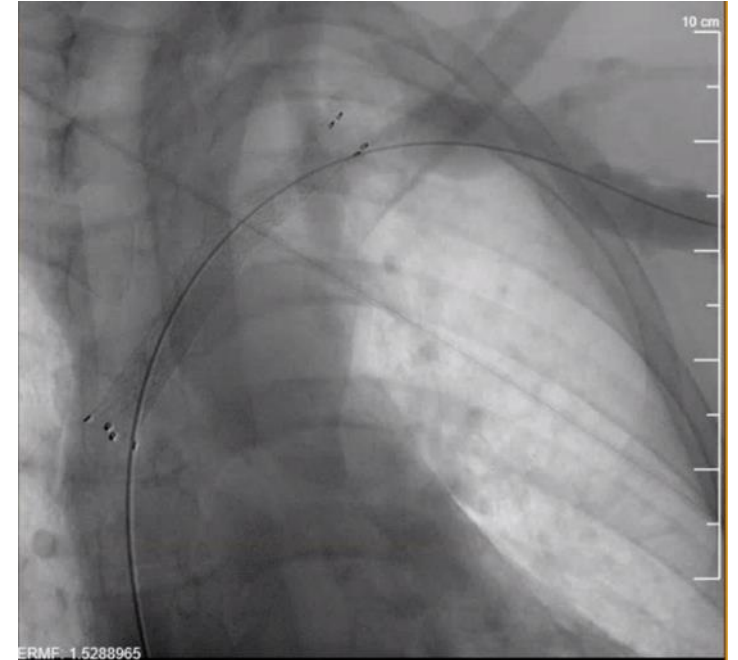
# Endovascular Intervention – RF Wire



Crossing lesion with RF Wire  
Snare in subclavian vein is target



Snaring femoral sheath to create  
through access



Angioplasty and Stenting across  
lesion over throughwire



# Patient #2 Post-Operative Course

- Discharged home post-procedure
- Marked improvement in patient's symptoms
- Underwent living donor kidney transplantation 1 year later
- Ligation of fistula 2 years after transplantation



# SVC Syndrome in HD Access

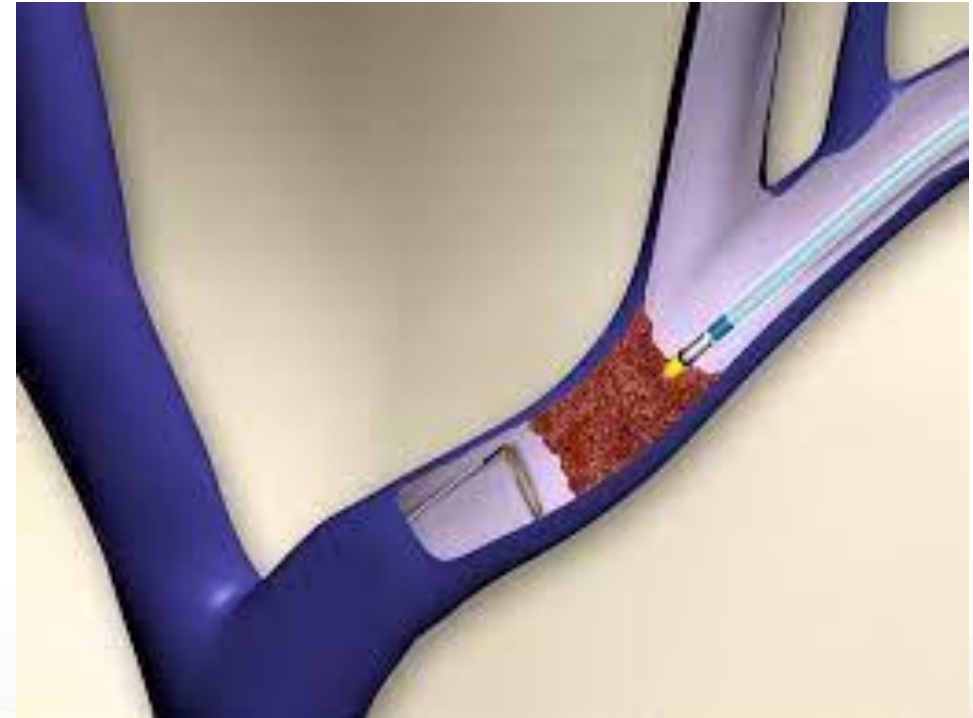
- Dialysis catheter most common cause of benign Central Venous Stenosis and SVC Syndrome with incidence of 7-40%
- SVC Syndrome causes catheter malfunction, reduces fistula patency, and leads to patient discomfort
  - Symptoms: unilateral/bilateral facial, chest, and/or arm edema/swelling
  - 50% are **asymptomatic if collaterals develop**
- Treatment
  - Indications: Symptoms, Impeding Catheter/Fistula dysfunction, Catheter/Fistula failure
  - Options: Endovascular recanalization or Open Bypass



Agrawal AK. Central vein stenosis. Am J Dis. 2013 June; 61(6):1001-15

# Radiofrequency Wire

- Uses radiofrequency energy to burn a channel through an occlusive lesion
- Once crossed, allows deployment of a balloon to recanalize the vessel
- Indicated for use in occluded peripheral vessels  $\geq 3$  mm

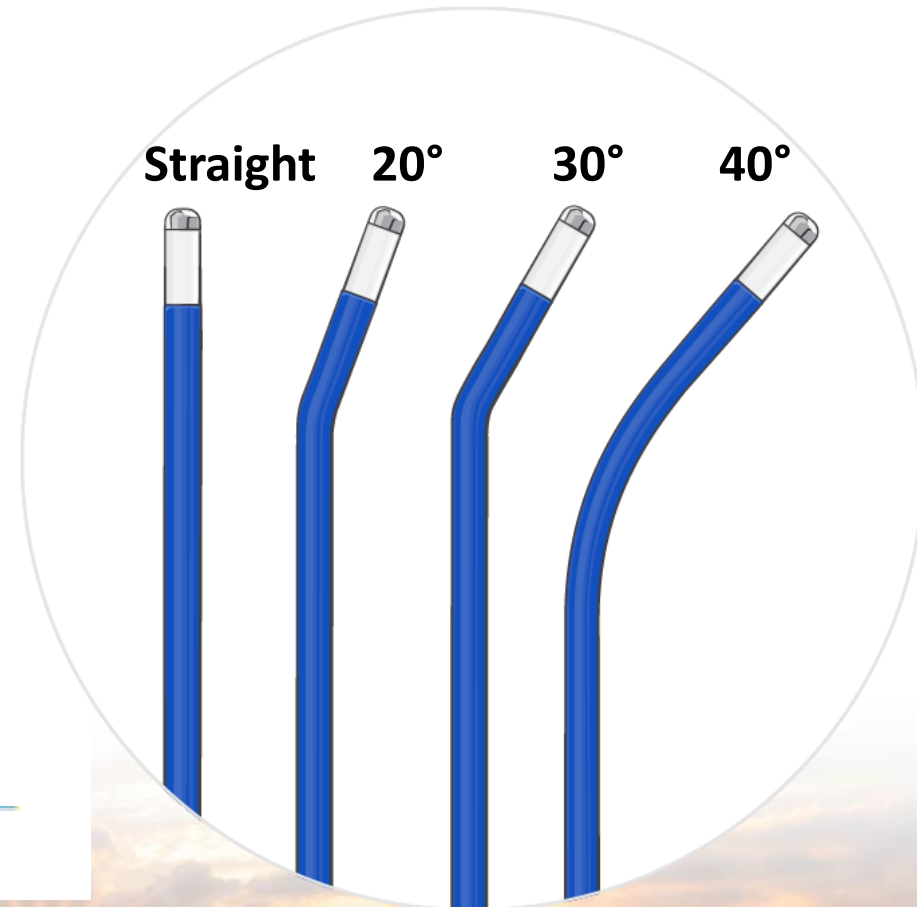
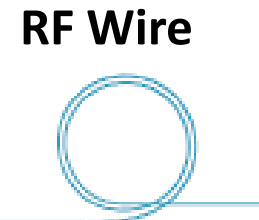
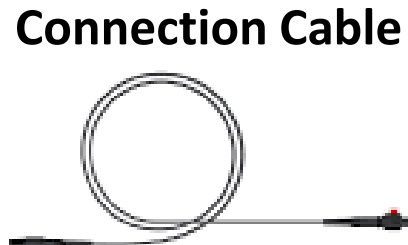


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# Radiofrequency Wire

- 0.035" Outer Diameter
- 4Fr Minimum Sheath
- Nitinol Core
- External Radiofrequency Generator



# Radiofrequency Wire Recanalization

- 24% of Central Venous Occlusions (CVOs) are unable to be crossed with conventional techniques<sup>1</sup>
- RF guidewire has been effective in recanalizing CVOs<sup>2</sup>
  - 43 patients treated with RF Guidewire
    - All previously failed standard techniques
  - 100% intraoperative technical success with RF Guidewire
  - 95% success rate at 9 months (primary patency)

1. Criado E et al. Proximal venous outflow obstruction in patients with upper extremity arteriovenous dialysis access. *Ann Vasc Surg*, 8 (1994), pp 530-535

2. Guimaraes M et al. Radiofrequency wire for the recanalization of central vein occlusions that have failed conventional endovascular techniques. *JVIR*. 23 (2012), pp 1016-1021



# Conclusions

- Endovascular recanalization is preferred treatment for central venous stenosis/occlusion
  - Particularly in SVC syndrome
- Consider RF Wire when prior endovascular attempts have failed
- Our work has shown feasibility of using the RF Wire to recanalize vessels and allow Angioplasty/Stenting

