



# IVUS Guided Case Review

## Case Performed by Frank R. Arko III, MD Charlotte, NC

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# Patient Presentation



**51 year-old African American male presented with rest pain in left leg with a history of prior self-expanding stent in left SFA.**



Presented with rest pain in left leg



History of stenting in left SFA



Underwent non-invasive peripheral arterial studies prior to our assessment which confirmed in-stent restenosis, and indicated fresh thrombus in-stent.

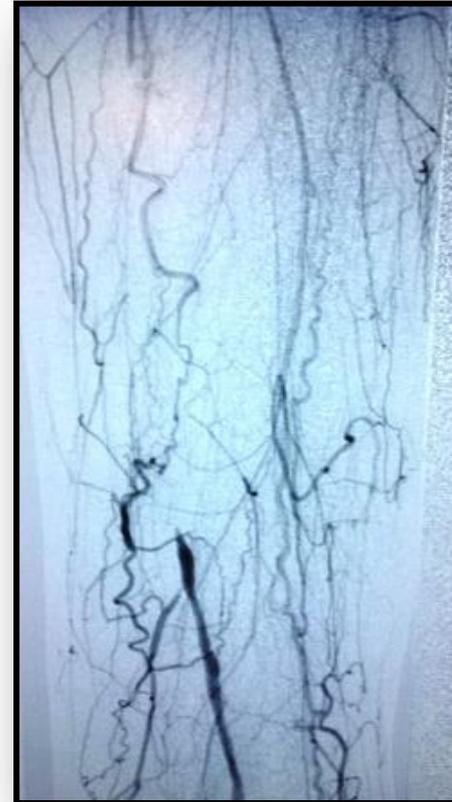
Image is a model, not an actual patient

# Initial Angiogram

Left Proximal SFA



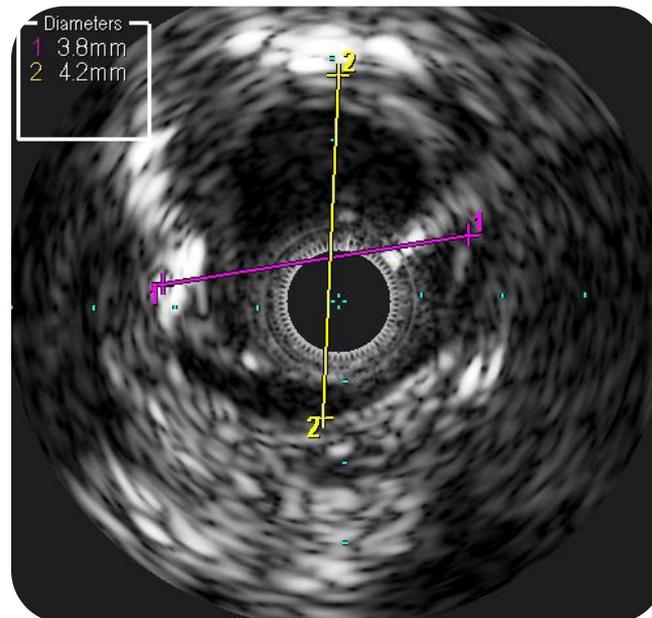
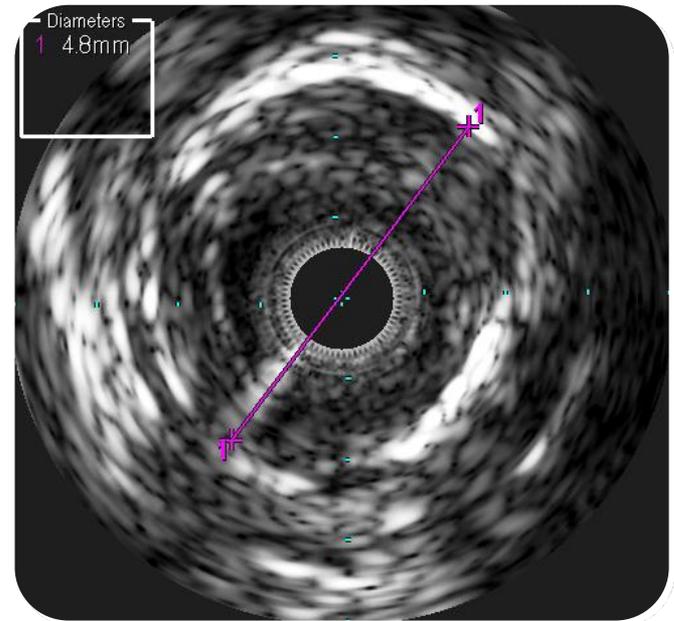
Left SFA Mid-Distal Occlusion



# Initial IVUS Pullback

IVUS assisted in determining the:

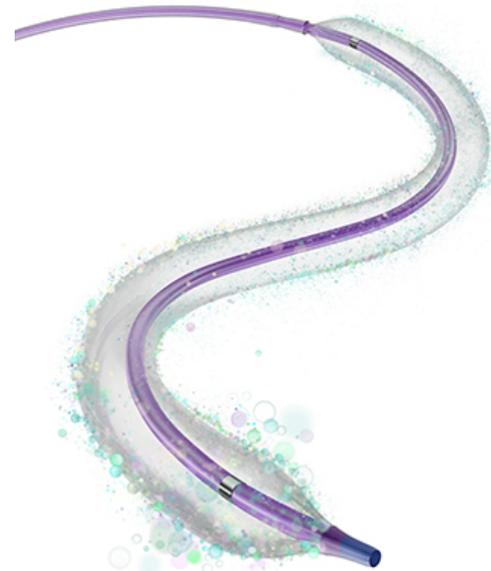
- Diameter of treatment area
- Plaque morphology
- Length of stenosis



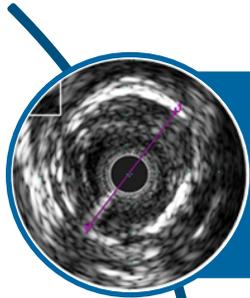
# Therapy Used

Based off the patient presentation, angiogram and IVUS the physician decided to treat the patient with:

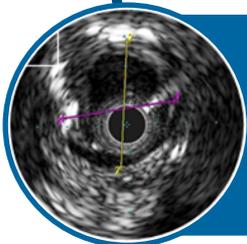
- Catheter-infused 10 mg of tPA to assist in resolving the thrombus inside the previously stented portion of the SFA.
- A 5 x 150mm Viabahn stent to treat the in-stent restenosis in the mid to distal SFA.
- A 5 x 120mm (2 each) and 5 x40mm Medtronic IN.Pact Admiral drug-coated balloon to treat the diseased area in the proximal SFA.



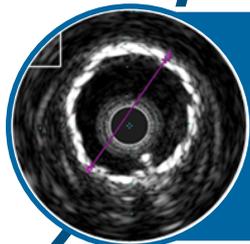
# IVUS Guidance Conclusions



IVUS confirmed in-stent restenosis in the distal lesion. Also, IVUS imaged fresh thrombus within the in-stent restenosis.



IVUS identified the vessel diameter thus assisting the physician to appropriately pre-dilate the distal lesion and determine proper sized Viabahn stent to treat the in-stent restenosis segment.

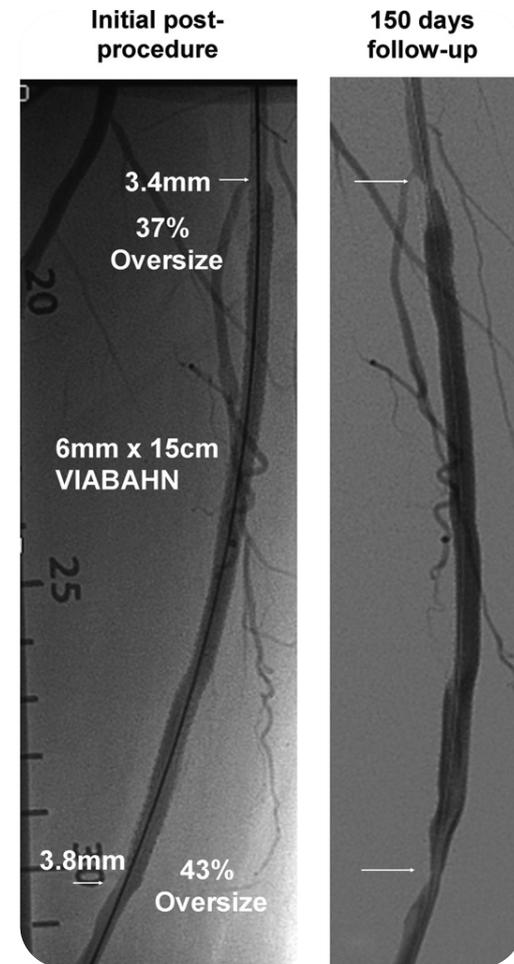


IVUS identified the proximal vessel diameter and where the normal proximal segment of the vessel occurred. This assisted the physician in determining the appropriate size and length of drug coated balloon needed to treat the proximal diseased segment.

# VIPER Trial-Results

The overall 1-year primary patency rate for complex lesions with a mean length of 19 cm was 73%.

The **1-year primary patency rate** for devices that were **not over sized ( $\leq 20\%$ )** relative to the proximal landing zone was **88%**, significantly better than the **70%** 1-year primary patency rate for devices that were **oversized  $> 20\%$**  ( $P = .047$ ).



Saxon R., MD et. al. Heparin-bonded, Expanded Polytetrafluoroethylene-lined Stent Graft in the Treatment of Femoropopliteal Artery Disease: 1-Year Results of the VIPER (Viabahn Endoprosthesis with Heparin Bioactive Surface in the Treatment of Superficial Femoral Artery Obstructive Disease) Trial. J Vasc Interv Radiol 2013; 24:165–173 .

# VIPER Trial - Size Matters

Primary patency rate was 88% in the VIPER trial if the stent was sized  $\leq 20\%$  relative to the proximal landing zone to the vessel.

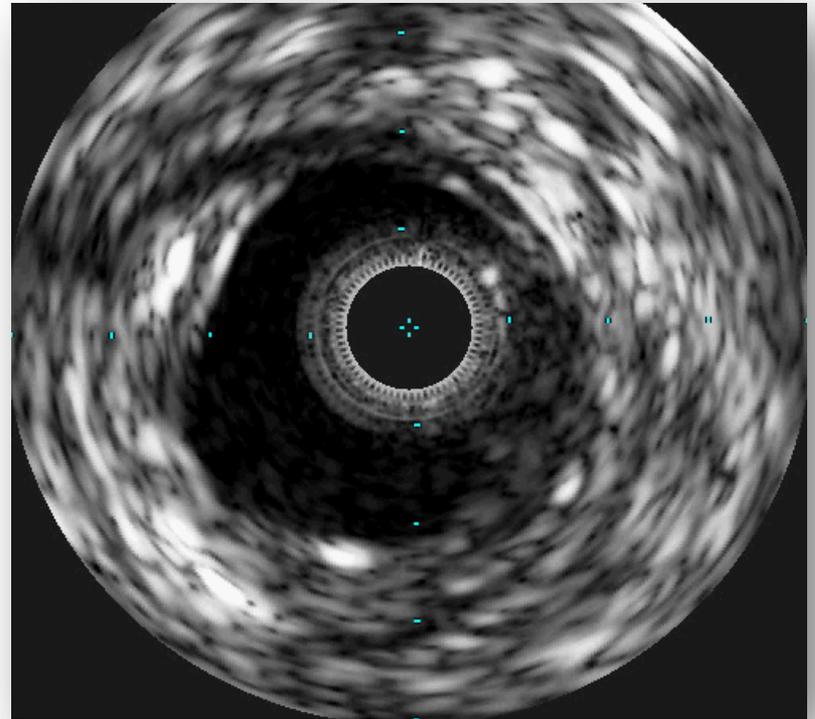
In the VIPER Trial if the stent was oversized by more than 20% then the primary patency rate dropped to 70% ( $P < 0.05$ )

Per the investigators, “Most of the excessive over sizing in this trial resulted from operators’ overestimation of the diameter of the arterial lumen. To avoid this, clinicians may employ quantitative techniques to optimize stent graft treatment.”

Saxon R., MD et. al. Heparin-bonded, Expanded Polytetrafluoroethylene- lined Stent Graft in the Treatment of Femoropopliteal Artery Disease: 1-Year Results of the VIPER (Viabahn Endoprosthesis with Heparin Bioactive Surface in the Treatment of Superficial Femoral Artery Obstructive Disease) Trial. J Vasc Interv Radiol 2013; 24:165–173 .

# Post IVUS After Treatment

Post therapy IVUS pullback performed to assess adequacy of therapy.



# Final Angiogram

Final angiogram performed post treatment.



# Conclusion

## IVUS Solution:

- IVUS confirmed in-stent restenosis, as well as demonstrating fresh thrombus in the in-stent restenosis segment.
- IVUS identified the vessel diameter thus assisting the physician to appropriately pre-dilate the distal lesion and determine proper sized Viabahn stent to treat the in-stent restenosis segment.
- IVUS identified the proximal vessel diameter and where the normal proximal segment of the vessel occurred. This assisted the physician in determining the appropriate size and length of drug coated balloon needed to treat the proximal diseased segment.
- Following therapy, IVUS was used to visualize the minimum luminal area and look for any flow limiting dissections that the angiogram may have missed. This assisted the physician in determining that an adequate result was achieved for the patient.

