Initial Experience Using A Novel High Definition (Hi-Def) Imaging System In Peripheral Arterial Interventions

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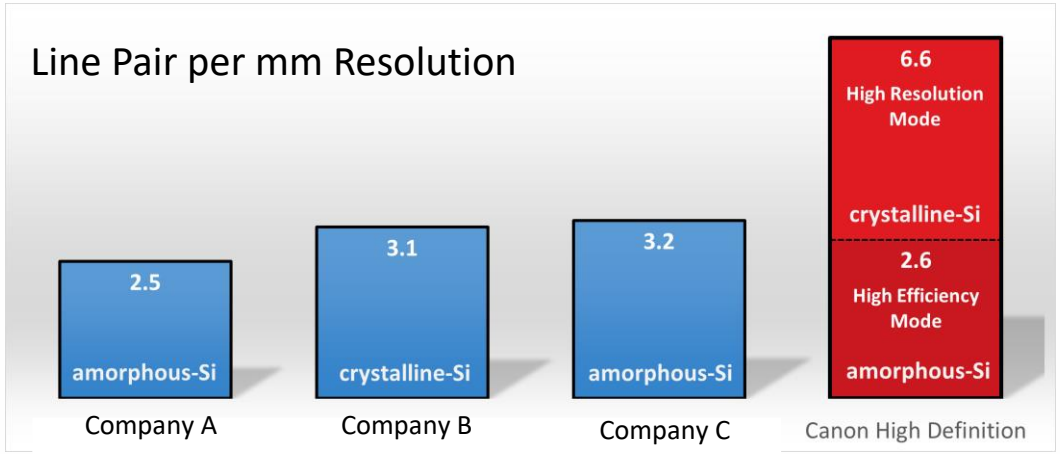
Background

- A newly developed high definition (Hi-Def) detector allows imaging with a resolution of 76 microns
- This is **more than twice** that of standard technologies.
- This unique system consists of a conventional flat panel detector (FPD) with embedded high resolution modes.
- This is the first report utilizing this technology to guide peripheral interventions.

Multi-detector provides more than **2x higher spatial resolution** than other available systems*



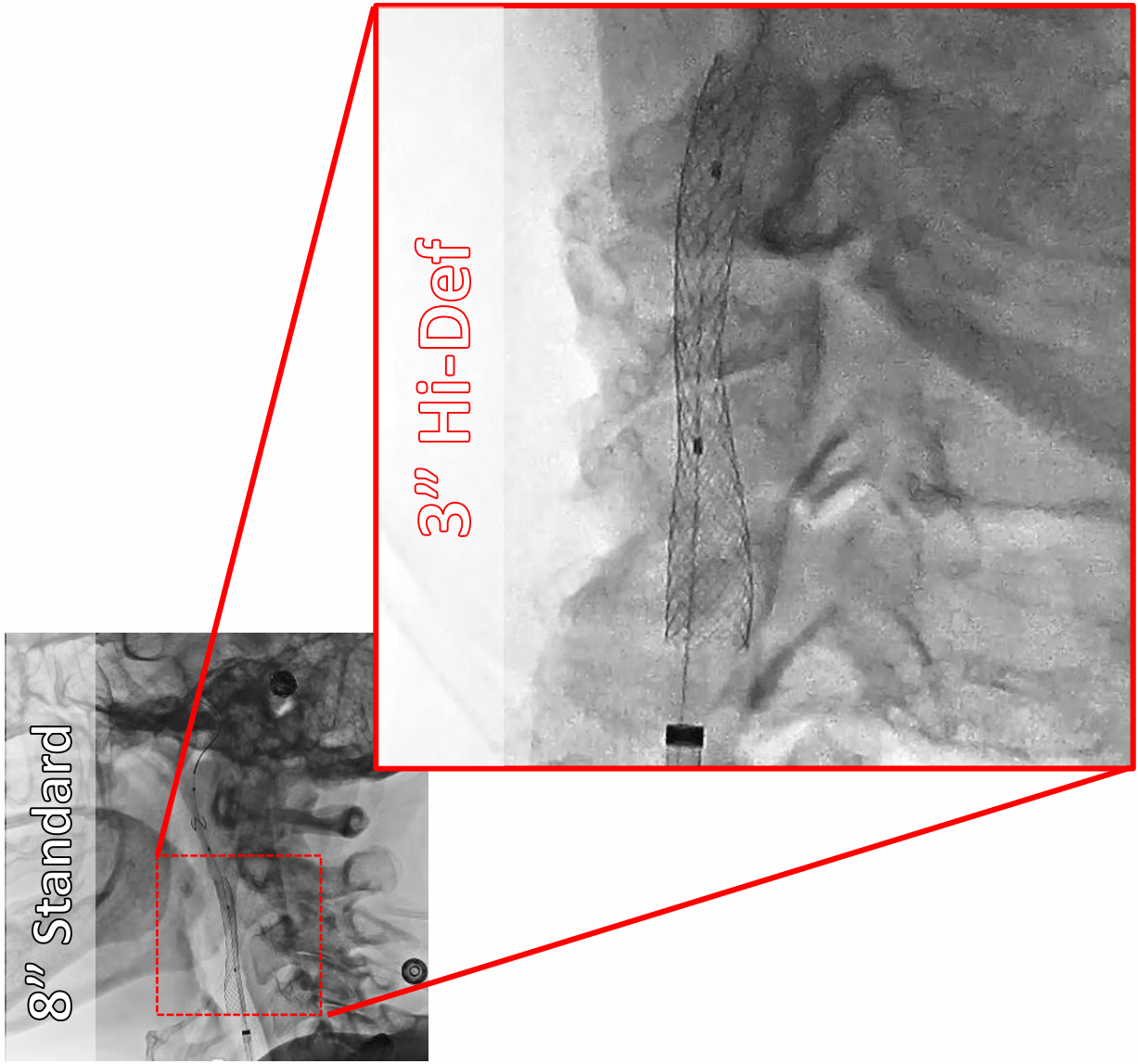
Standard:
[194 µm pixel]

- 12”
- 10”
- 8”
- 6”

High Definition Modes

Hi-Def:
[76 µm pixel]

- 3”
- 2.3”
- 1.5”



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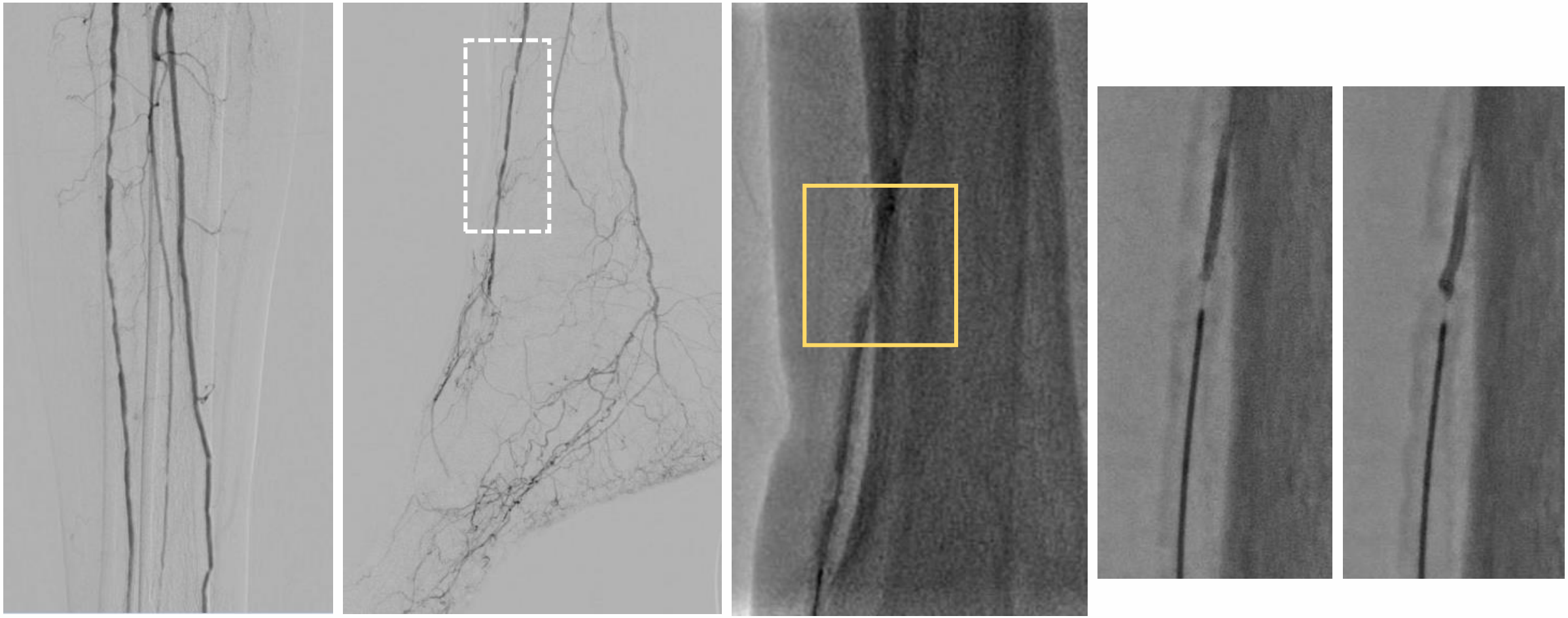
Methods

- Three patients with below-knee arterial occlusions underwent endovascular intervention using this novel Hi-Def imaging system.

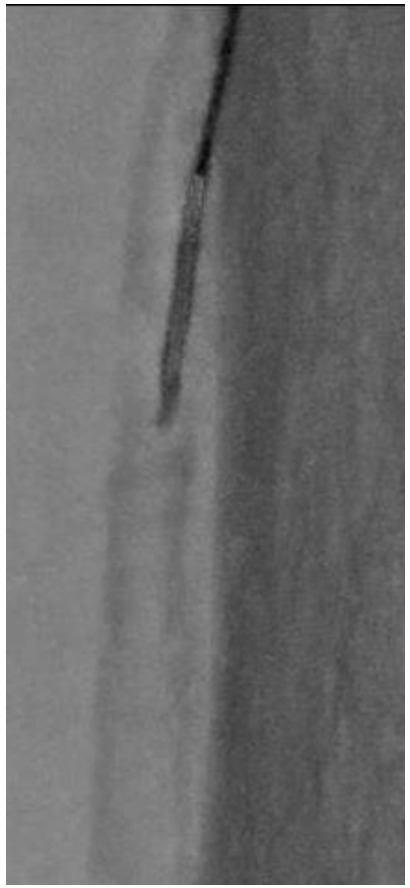
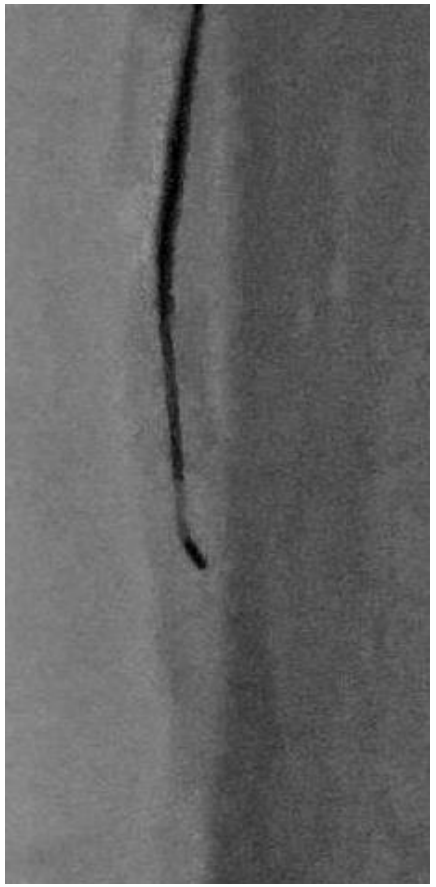
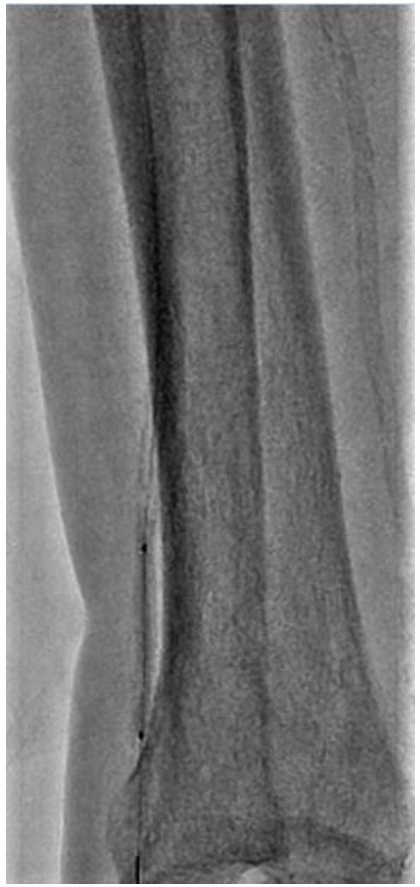
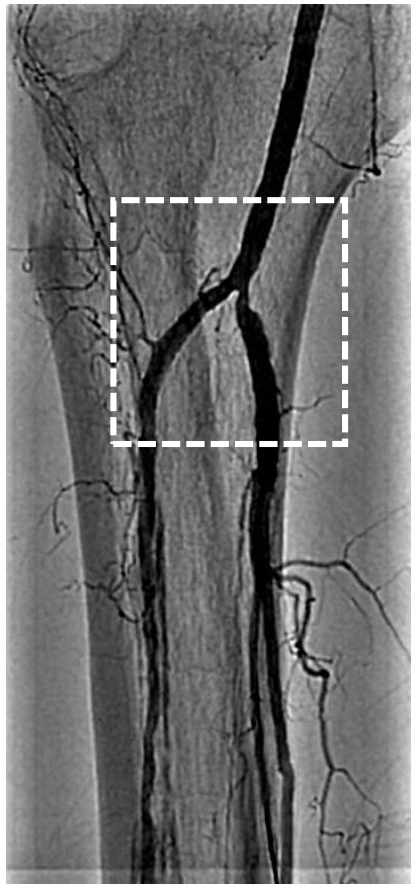
- The **Hi-Def mode** was used to:
  - Study the vessel anatomy prior to intervention, and/or
  - Guide wire passage through challenging anataomy, and/or
  - Aid device positioning during the intervention, and/or
  - Stent deployment for the majority of interventions.

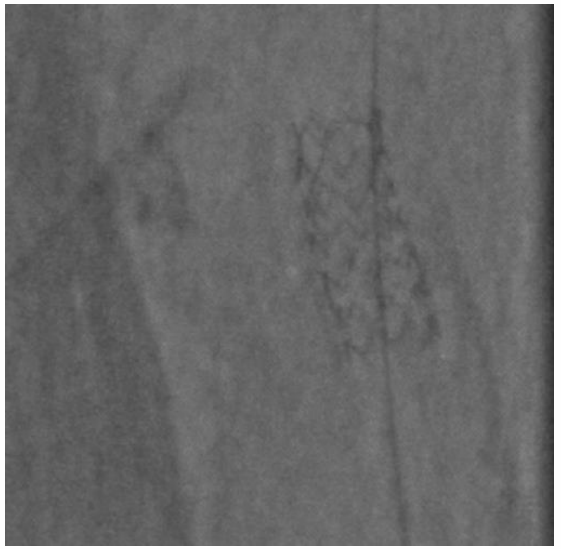
- **FPD images** were used for qualitative comparison.

Case No. 1: Wire Passage and Trouble Shooting

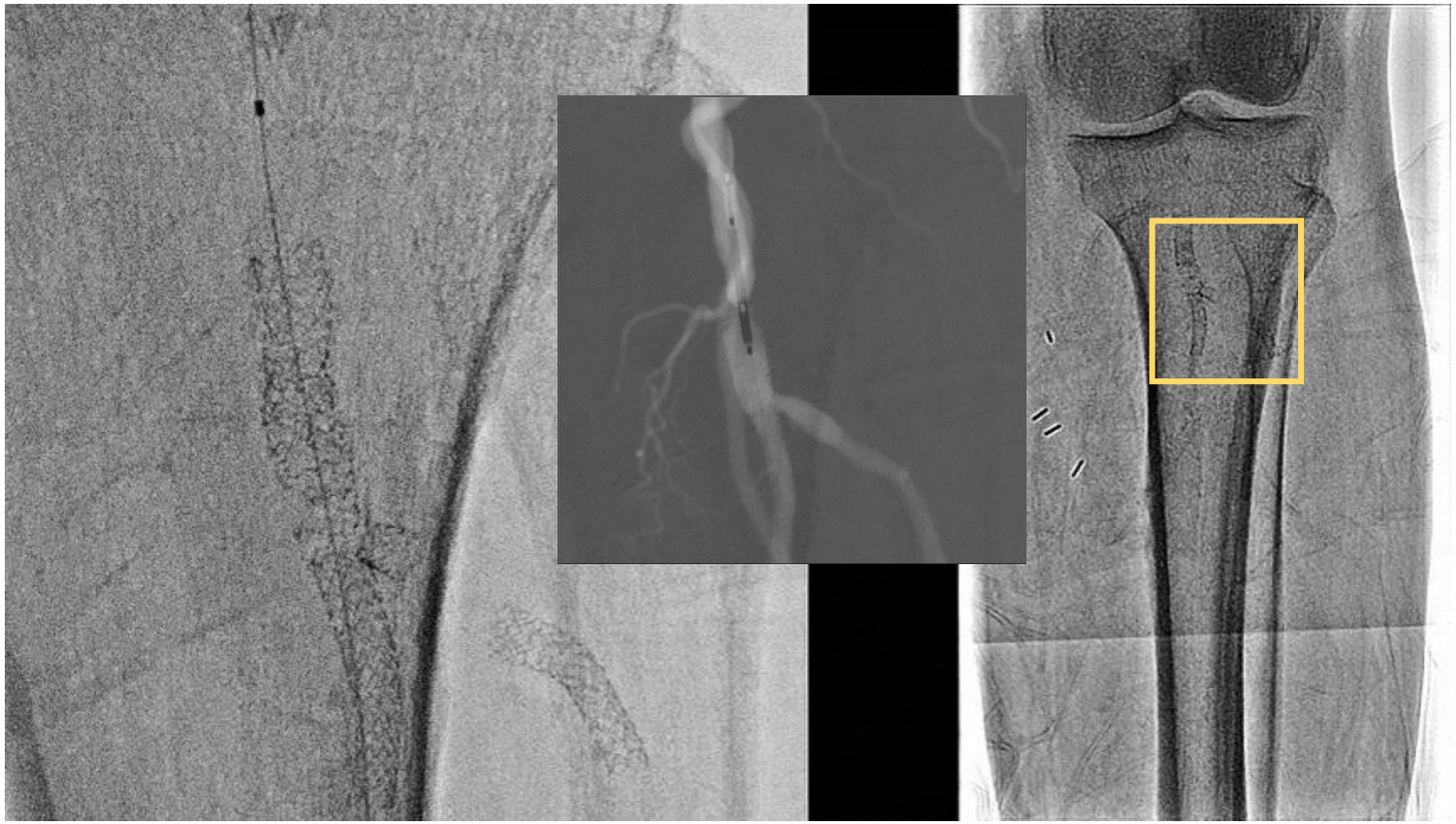


Case No. 1: Stent Placement

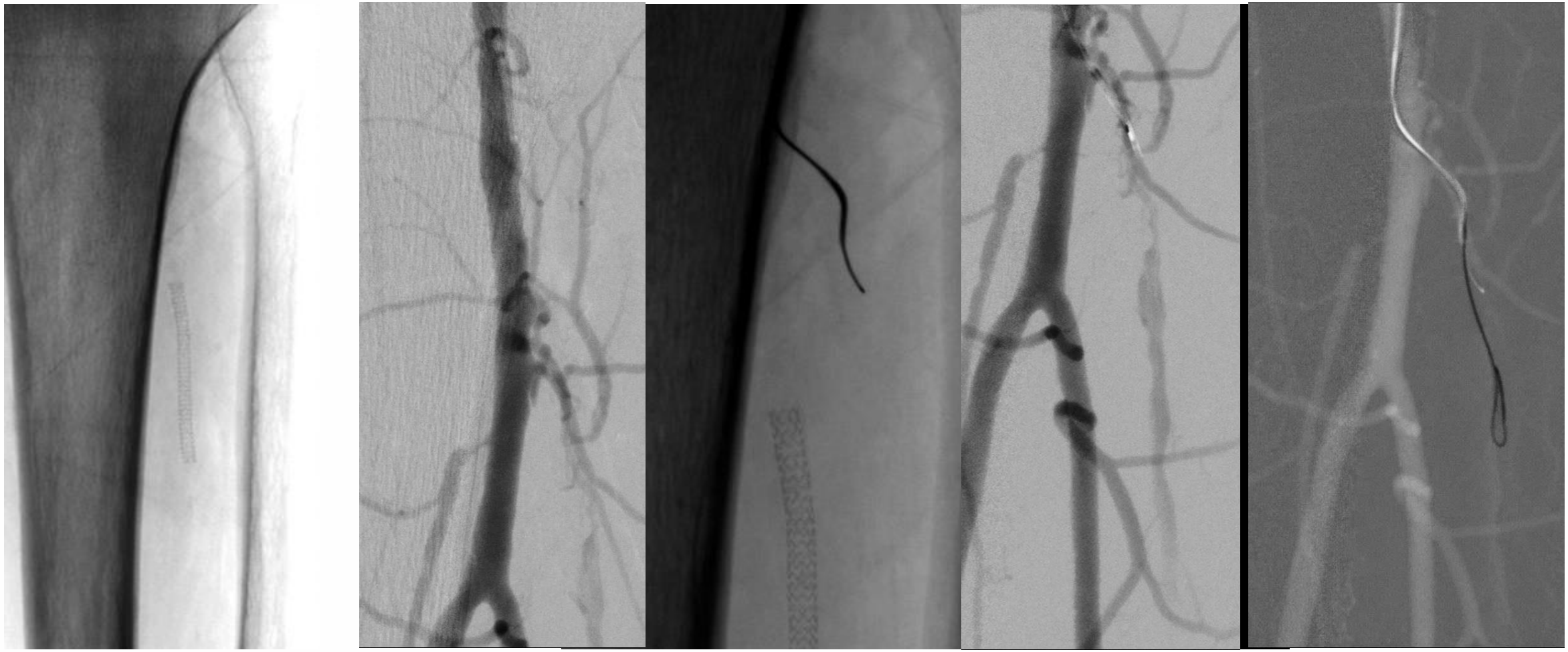







Case No. 2: Stent Architecture



Case No. 3: Wire Navigation Through Hostile Anatomy



Results

- All patients underwent successful revascularization of below-knee arterial occlusions.
- In one patient, guide wire passage across a tortuous segment was unsuccessful with conventional FPD imaging after multiple attempts
- Use of Hi-Def mode resulted in prompt success by improving visualization of wire movement within the occlusion.
- In the other cases, Hi-Def imaging was able to clearly resolve individual stent struts and identify stent fractures and an avulsion not clearly seen in the FPD images.
- Hi-Def mode was also used for wire passage through the deformed stents struts and to position stents.

Conclusions

- Our initial experience using a novel Hi-Def imaging system shows that it can effectively be used in real time to improve visualization of lower extremity vasculature and interventional devices during complex peripheral arterial interventions and may be used to improve technical outcomes.

Questions?

- For questions, please contact the presenting author at: salman.a.arain@uth.tmc.edu