Intra-arterial arteriography does not always accurately reflect the anatomy: What can be done to fix this problem?

Prof. Dr. med. Nicolas Diehm, MBA
Interventional Angiology
Kantonsspital Aarau, Switzerland

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Below-the-Knee CTO Case
Hemodynamic findings at baseline

74-year old diabetic patient with great toe ulcer, critical limb ischemia.

Below-the-Knee CTO Case
DSA at baseline

Pedal Angioplasty: ATA / dorsal pedis artery

Pedal Angioplasty: posterior tibial artery
Below-the-Knee CTO Case
Hemodynamic findings postprocedurally

Limitations of DSA

- DSA considered gold standard. Images used to define revascularization options.
- Caveat: Depending on extent of arterial obstructions and position of diagnostic catheter, patent arteries may fail to opacify on DSA.
- Selective angiograms may better depict “real” anatomy.

Angiographic imaging of BTK arteries

MRA is superior to DSA

- MRI allows visualization of up to 10% more BTK vessels than DSA.
- MRI superior to DSA in depicting BTK arteries distal to long-segment occlusions.
- MRI allows visualization of flow velocities of 2 cm/s.
- MRI allows late contrast visualization of distal runoff vessels.
- Distal runoff detected by MRA was shown to be a predictor for successful endovascular therapy, improved long-term patency and limb salvage.

Conclusions

- Preprocedural DSA may underestimate technical options in endovascular / open surgical limb salvage procedures.
- Endovascular wire test, MRA or surgical exposure should be performed in patients in whom DSA fails to reveal runoff vessels suitable for use in a limb-salvage procedure.

References: