This is not the case I’m presenting

Direct puncture embolization/sclerotherapy
What could be easier?

Technique
• Anesthesia – LMA most often
• Ultrasound localization
• Enter lesion with micropuncture needle, butterfly, or angiocath
• Ensure blood return, inject contrast to verify position
• Inject sclerosant – foam will show shadowing
• Occlude tract with collagen suspension

Low flow malformations - sclerotherapy
• How to make procedure easier and avoid complications
  – IV in foot for venogram, and to flush deep veins continuously (heparinized saline in pressure pack)
  – BP cuff (automatic tourniquet) above lesion to distend VM for easier puncture and to control outflow
  – Do not inject sclerosant if it is a channel type malformation draining directly into deep system unless you’ve blocked the outflow vein
  – Always inject contrast before injecting sclerosant
  – If you see even brief flash of arterial branch filling do not inject sclerosant
  – Ensure adequacy of deep veins before occluding anomalous veins (KT vein)
  – Close entry tract with collagen (Surgi-flo, Floseal)
  – Keep pt well hydrated and do not exceed 0.5cc/kg total
  – Use IV sodium bicarb if high dose is used
  – Release BP cuff slowly while watching on fluoro

Prevention of thromboembolic complications -
Automatic tourniquet, Pressurized IV heparin infusion

Cuff distends lesion for easier access and control of outflow
Continuous pressurized heparinized saline infusion via peripheral IV to prevent DVT
US guided puncture

In simple cases it probably makes no difference which sclerosant is used

HEMOSTATIC MATRIX

Use to occlude tract on angiocath withdrawal
- Stops bleeding
- Reduces risk of sclerosant tracking to skin and causing ulceration

34 y o male with low flow VM knee
Very athletic, pain on exercise

SOTRADECOL (SODIUM TETRADECYL SULFATE)

- ALTERNATIVE SCLEROSANT TO ETHANOL (DETERGENT)
- HAS BEEN IN USE FOR VARICOSE VEIN TREATMENT FOR MANY YEARS
- AVAILABLE IN 1% AND 3% SOLUTIONS
- CAN BE USED AS FOAM (WITH SMALL AMT. CONTRAST AND AIR) – MORE POTENT
- LESS TISSUE/NEURO TOXICITY
Flash of arterial filling during direct injection

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Result
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“Blind” (unguided) direct embolization/sclero
- Some have advocated this in literature as simple outpatient procedure
- Once you have seen what can fill on image guided procedures, you understand the risk
  - Inadvertent intra-arterial injection
  - Injection into large outflow veins - risk of PE or central cardiovascular event
  - Extravasation into tissues with ulceration

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High flow AVM right leg calf to foot (Pt with PTEN mutation)
Macrodactyly, swelling, pain
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**Embolization using nBCA**

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Progression in calf, severe venous hypertension – nBCA embolization
PT shunt closed
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Age 12

Age 15

Age 18
No “safe” transvascular access, direct embolization with nBCA

Age 22

Even a “non tissue toxic” agent in the wrong place...

At 1 month, great toe amputated  
At 3 months, non-healing surgical site, progressive ischemia