Endovascular Treatment of Yakes Type IV AVMs

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YAKES TYPE IV AVMs

An unusual angioarchitecture for AVMs. In all AVMs there is an artery-to-vein connection without an intervening capillary bed. In Type IV AVM, there are innumerable micro-fistulae infiltrating a tissue. But there must also be nutrient capillaries separate from the AVF connections, arising from the same arterioles as the AVFs. Therein lies the problem of vascular occlusion of the AVFs and sparing of the capillaries admixed among the AVFs.

ENDOVASCULAR TECHNIQUES FOR YAKES TYPE IV AVMs

- Transarterial Embo proximal to the AVFs use 50%-50% ethanol with non-ionic contrast to treat this AVM type.
- If direct puncture into the AVFs is possible, then pure ETOH can be used as capillaries are now not at risk.

Examples of Endovascular Techniques to Treat Yakes Type IV AVMs

Example of Transarterial 50%-50% ETOH-Non-Ionic Contrast Embolization

19 yo female with growing painful mass in the proximal Lt forearm. Prior surgical clipping of Ulnar artery branch to the AVM. Worsening of the pain syndrome and increased growth of the Extensor muscle compartment of the AVM muscular tissues post-clipping.

……. A 50%-50% mixture of ethanol and non-ionic contrast can be curative in this lesion type as an embolic agent as it shunts quickly through the low-resistance AVFs, and is difficult to flow through the engorged increased resistance of the normal capillaries due to its increased viscosity mixed with contrast.
Trans-microcatheter embolizations of Lt forearm Yakes Type IV AVM with 50%-50% ETOH-Non-ionic contrast mixture.
Example of AVM Direct Puncture Technique

39 yo male with Rt hand Yakes Type IV AVM infiltrating the dorsum of the hand with an enlarging painful mass. Example of a single session ethanol embolization with direct puncture into multiple microfistulous compartments.

Note Onyx cast & clips to no effect
20 yo female with growing painful mass in Lt shoulder Deltoid muscle admitted for treatment.
Examples of direct puncture embolization in this Yakes Type IV Shoulder AVM

Pre-Embo #1

Post-Embo #1a: 3 ml ETOH

Pre-Embo #4

Post-Embo #4a: 2 ml ETOH

Example of direct puncture into the feeding artery supplying the AVM of this Yakes Type IV Shoulder AVM in the same patient, then using 50%-50% ETOH-Non-Ionic contrast mixture to treat that AVM compartment.
Pre-Embo #1

Pre-Embo #1, later phase

Post-Embo #1a: 4 ml ETOH
Note preservation of the parent feeding artery as the capillaries remain intact.

Prior to treatment, early

Prior to treatment, later phase

2 year arteriographic f/up
YAKES TYPE IV AVM

- Transarterial approaches using 50%-50% ETOH-Non-Ionic contrast is efficacious in ablating this infiltrative form of AVM via transcatheter or direct puncture techniques.
- Normal tissues and capillary beds are spared by this new technique innovation.
- Direct puncture in the fistulous connections allow non-diluted ETOH to be used safely in treating this infiltrative AVM type.