Yakes Type I, IIb, IIIa, IIIb
The Retrograde Vein Approach

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Disclosures

- None

Type I:
- A direct artery to vein fistula connection.

Type IIa:
- Multiple arteriovenous connections with a typical "nidus" interconnecting vascular tubular structures that then drain into an outflow vein.

Type IIb:
- Similar to Type IIa but the "nidus" drains into an aneurysmal vein with a single outflow vein.

Type IIIa:
- Multiple in-flow arterioles shunting into an aneurysmal vein that has a single vein outflow. Fistulae are in the vein wall.

Type IIIb:
- Similar to Type IIIa but the "nidus" drains into an aneurysmal vein with multiple outflow veins. The fistulae (nidus) are in the vein wall.

Type IV:
- Multiple arteries/arterioles that branch in "en passage" fashion to form an innumerable microfistulae that diffusely infiltrate the affected tissue. Because the tissue is viable and not devitalized, capillary beds must also be present admixed among the innumerable AVFs. The innumerable micro-AVF drain into multiple veins. The normal post-capillary venous drainage then competes with the arterialized vein outflow for drainage causing venous HTN in tissue.

Treatment options

- I (AVF) — Coils/plugs
- IIa (classic AVM nidus) — ETOH cath or direct
- IIb (classic nidus with single outflow vein) — ETOH cath or direct with coil packing of vein
- IIIa (aneurysmal vein single outflow) — Curative coil packing of vein
- IIIb (aneurysmal vein multiple outflow) — Coils
- IV (diffuse infiltrating) 50/50 ETOH/contrast

Venous Predominant Lesions

- Yakes I
  - Direct A-V connection
  - Pulmonary AVM
  - Coils, plugs
  - Simplest to treat

- Yakes Type IIb AVM
  - A "nidus" is still present, but instead of multiple outflow veins draining from the nidus, there is a single aneurysmal outflow vein.
  - Two endovascular approaches are curative for this Type IIb AVM.
    - Like Type IIa, transarterial and direct puncture into nidus ethanol embolizations are curative.
    - Like Type IIIa & Type IIIb:
      - Transvenous retrograde vein approach
      - Direct puncture of the vein aneurysm with complete coil packing of it is also curative.
Yakes Type IIb AVM

Direct puncture and coils--cured

Multiple in-flow arteries into the aneurysmal vein wall (the vein wall is the "nidus") with single out-flow vein. Ethanol and/or coil packing in the vein sac can be curative.
Multiple in-flow arteries/arterioles shunting into an aneurysmal vein with multiple out-flow veins. More challenging to treat with coils as the multiple veins must be treated.
Yakes Classification of AVMs

- Only classification system in which architecture informs treatment and produces consistent cures.
- Venous predominant lesions are now curable in a high percentage of cases!

Treatment options

- I (AVF)—Coils/plugs
- IIA (classic AVM nidus)-ETOH cath or direct
  - IIB (classic nidus with single outflow vein)
    - ETOH cath or direct with coil packing of vein
  - IIIa (aneurysmal vein single outflow)
    - Curative coil packing of vein
  - IIIb (aneurysmal vein multiple outflow)
    - Coil packing of vein
- IV (diffuse infiltrating) 50/50 ETOH/contrast