Arteriovenous malformations:
The Yakes AVM Classification System
and its curative Implications
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Background
The Yakes Classification System
• Further refinement of previous Classification systems
• IV AVM Types based on angioarchitecture
• Defines the nidus and is a guide on treatment strategy
• Ethanol and coils
• Based on long experience with AVM

The Yakes Classification System
Type I AVM:
A direct artery to vein fistula connection
without Nidus

Artery Vein
• Permanent occlusion using mechanical devices such as coils, detachable balloons, Amplatz plugs
• Ethanol, either alone (in small Type I) or in combination with any of the mechanical occluders

Type IIa:
Multiple arteries/arterioles connecting to a typical "nidus" interconnecting vascular tubular structures that then drain into out-flow veins.
Nidus directly accessed via:
- superselective transcatheater arterial approach or
- direct puncture of the feeding arteries immediately proximal to the nidus to deliver ethanol

**Type IIb:**
Same as Type IIa except the "nidus" drains into an aneurysmal single out-flow vein. The nidus precedes the vein aneurysm.
Permanent Occlusion using:
- superselective transcatheter arterial approach to the nidus or
- direct puncture immediately proximal to or in the nidus to inject ethanol
- DP or retrograde access to the aneurysmal vein with coil packing for nidal ablation, with or without ethanol.

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

Type IIIb:
As in IIIa multiple in-flow arteries and arterioles shunting into an aneurysmal vein but with multiple out-flow veins. The fistulae (nidus) are in
- DP or retrograde vein approach of aneurysmal vein and coil packing for nidal ablation
- with or without ethanol
- Coil occlusion of the vein sac maybe needs to be extended into the draining veins.

**Type IV:**
- Multiple arteries/arterioles that form innumerable micro-fistulae that diffusely infiltrate the affected tissue, admixed with normal capillaries
11/19/2018

Treat with DP, pure ethanol

Superselective (DP or transcatheter): 50/50% mixture with contrast

Conclusion

- The Yakes Classification, based on angioarchitecture and hemodynamics, offers a clear definition of where the AVM nidus is located

- The Yakes Classification determines where to deliver ETOH, in different concentrations, and/or coils with a high rate of curative outcomes