Arteriovenous Malformation (AVM)

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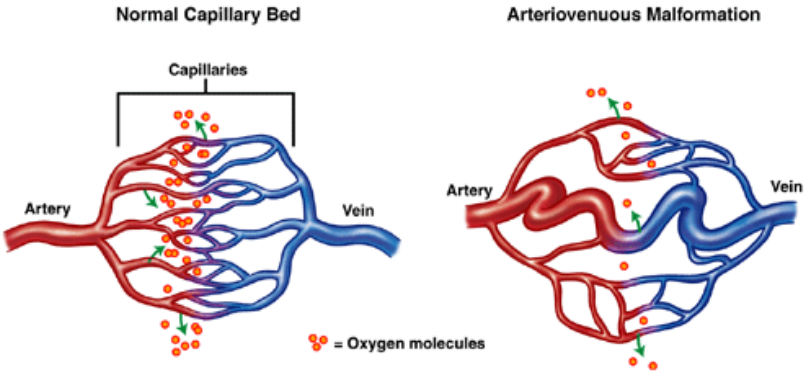
Definition: A tangle of abnormal blood vessels connecting arteries and veins in the brain.



Normally: Arteries carry oxygenated blood from the heart to the brain, and veins carry blood with less oxygen away from the brain and back to the heart.

AVM: blood vessels are tangled and they bypass normal brain tissue and diverts blood from the arteries to the veins.

Incidence/occurrence:

- Brain AVM's affect less than 1 percent of the population.
- Estimated 1 in 200-500 people may have an AVM.
- AVM's are more common in males than females.
- Can occur anywhere in the body, but most often in the brain or spine.
- Usually congenital, but some form later in life. Not hereditary
- No known cause, but researchers believe most develop in during fetal development.

Symptoms:

May not have any signs or symptoms until the AVM bursts (hemorrhage). Hemorrhage is the first sign in about half of all brain AVM's. The other half may experience the following symptoms:

- Seizures (20-25% of those with AVM)
- Headache (vary with location of AVM)
- Muscle weakness/ numbness/ paralysis of one part of the body
- Vision loss
- Difficulty speaking
- Confusion or inability to understand others
- Severe unsteadiness
    - 15% of those with an AVM have difficulty with movement, speech, and vision.

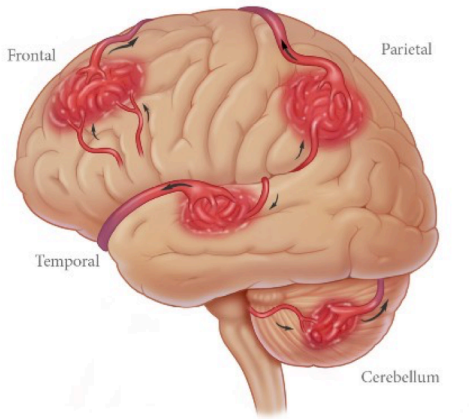
AVM Rupture:

The AVM puts a lot of pressure on the walls of the arteries and veins that are included in the tangle causing them to become thin or weak. The increased pressure of blood flow may cause the blood vessels to dilate and eventually burst. Causing bleeding on the brain (hemorrhage).

- Brain AVMs account for about 2 percent of all hemorrhagic strokes each year.
- The chance of a brain AVM bleeding is 1-3 percent per year.
- The risk of a second bleed is elevated for a short period of time after the first bleed.
- Individuals are at a slightly higher risk of bleeding between the ages of 11 and 35.

Types of Brain AVMs

- **True Arteriovenous Malformation**- (most common)
- **Occult or Cryptic AVM or Cavernous Malformation**- (does not divert)
- **Venous Malformation**- (veins only)
- **Hemangioma**- (surface of brain or on the skin of facial structures)
- **Dural Fistula**- (dura mater)
    - **Dural Carotid Cavernous Sinus Fistula**- (behind the eye)
    - **Transverse- Sigmoid Sinus Dural Fistula**- (behind the ear)
    - **Sagittal Sinus and Scalp Dural Fistula** – (top of head)



Parietal Lobe- intelligence, language, reading, sensation

Frontal Lobe- behavior, intelligence, memory, movement

Occipital Lobe- vision

Temporal Lobe- behavior, hearing, memory, speech, vision

Cerebellum- balance, coordination

Brainstem- blood pressure, breathing, consciousness, heartbeat, swallowing

Ventricles- secretion of cerebrospinal fluid

Diagnosis

- Cerebral arteriography- AKA cerebral angiography.
  - Most detailed test to diagnose.
  - The test reveals the location and characteristics of the feeding arteries and draining veins.
  - Catheter inserted in an artery of the grin and is thread to your brain. Dye is injected into the blood vessels of the brain and X-ray imaging is used to view it.
- Computerized tomography (CT) scan-
  - a series of X-rays to create a detailed cross-sectional image of your brain
  - sometimes dye is used to view the AVM in greater detail
- Magnetic resonance imaging (MRI)
  - Uses powerful magnets and radio waves to create detailed images of your brain.
  - More sensitive than a CT.
  - MRI provides information about the exact location of the AVM

Treatment

- Medical Therapy
  - Use for patients with limited to no symptoms.
- Surgery
  - Used if in an area the AVM can be reached surgically.
- Stereotactic radiosurgery (SRS)
  - Used if the AVM is not too big, but in an area that cannot be reached.
- Interventional neuroradiology/ endovascular embolization
  - Blocking off the abnormal blood vessels with materials placed by a catheter.
- For further explanation visit. http://www.taafonline.org/am_about.html

SLP involvement

An SLP would be involved in the rehabilitation process following a brain injury. Because there are typically no symptoms to an AVM, a patient would not know about it until after there was a brain bleed. Following the brain bleed most patients will need rehabilitation including speech, physical therapy, and occupational therapy. It will all depend on the area of the brain the bleed occurred, and the size of the bleed.

Brain injury rehabilitation consists of two processes.

- Restoration of functions that can be restored
- Learning how to do things differently when functions cannon be restored.

Cognitive/ Language

Patients may have difficulties with these areas following a brain bleed.

- Attention
- Memory
- Thought organization
- Social skills
- Problem solving
- Decision making
- Planning
- Judgment
- Word-finding difficulty
- Poor sentence formulation
- Circumlocution
- Confabulations
- Dysarthric speech
- Dysphagia
- Apraxia of speech

http://www.taafonline.org/am_about.html
http://www.uic.edu/depts/dhd/ilcapture/stroke/stroke/AVM%20info.pdf
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