Current Optimal Treatment for Vertebral Artery Disease: Indications and When is Open Surgery the Best

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Vertebral Artery Disease
Disclosures
None

Vertebral Artery Disease
What needs to be managed?
- Atherosclerosis
- Dissection
- Embolic occlusion
- Traumatic disruption
- Low flow
- FMD / Takayasu’s
- Compression
- Vasoospasm
- Aneurysm

Treatment?
- No treatment
- Medical
- Endovascular
- Surgical
- Combination

Vertebral Artery Disease
Anatomy

Vertebral Artery Disease
Clinical Presentation
- Signs and symptoms
  - Disequilibrium – sensation of impending fall
  - Vertigo – abnormal sensation of motion
  - Diplopia – two images of single object are seen
  - Cortical blindness – blindness from brain cortex
  - Alternating paresthesia – moving sensation of pricking, tingling, or creeping on skin with no stimulus
  - Tinnitus – sensation of noise that is caused by a bodily cond.
  - Dysphagia – difficulty in swallowing
  - Dysarthria – difficulty in speech
  - Drop attacks – sudden fall without loss of consciousness
  - Atelecta – poor coordination and unsteadiness
  - Perioral numbness – numbness around the lips and mouth

Vertebral Artery Disease
Disease Distribution
- V1: Atherosclerotic stenosis at origin (often missed)
  - Present 20-40% of the time in patients with CVD
- V2: Osteophyte compression or musculo-tendinous structures with anomalous entry into transverse foramina (often missed)
- V3: Most common for trauma, dissection, pseudoaneurysms
- V4: Trauma and stretch injuries: thrombosis, dissection, embolization
Vertebral Artery Disease

Pathophysiology

- Vertebrobasilar ischemia less well understood
- Peculiar and varying anatomy
- Difficult to access to artery
- Symptoms are difficult to read (often bilateral)
- “More” causes of disease
- Leads to under diagnosis of the disease

Surgical Approach

Technique for Surgical Exposure of Vertebral Artery in the Cervical Region

E. H. Rentschler, M.D.
From the Division of Neurosurgery, Department of Surgery, University of Texas Medical Branch, Galveston, Texas

Annals of Surgery
April 1958

Surgical Approach: Step 1

“A transverse skin incision is made 2.5-3 cm above clavicle from med. sternal head to lat. clavicular head

Surgical Approach: Step 2

“Self-retaining retractor is used to retract the skin in a vertical direction and the muscle bellies in transverse plane.”

Surgical Approach: Step 3

“…carotid sheath palpable, usually somewhat laterally… blunt dissection exposes CCA and IJV… penrose around the CCA.”

Surgical Approach: Step 4

“…separating the fascial plane between the longus colli and anterior scalene muscles… blunt dissection one can next pass deeper and more medially to bring the vertebral artery into view…”
"...the artery is in the angle between the vertebral body of C7 and the transverse process in the depth of wound... separation of structures vertically with a blunt hemostat will quickly seek out the plane in which the vertebral artery lies and bring it into view."

**Vertebral Artery Disease**

**Surgical Approach: Step 5**


- Retrospective review: 369 consecutive ECVA
- Clinical presentation:
  - Hemispheric: 4%
  - Hemispheric and vertebrobasilar: 30%
  - Vertebrobasilar: 60%
  - 300 ECVA recons were for atherosclerosis
  - 252 proximal reconstructions
  - 117 distal reconstructions
  - 83 concomitant vertebral and supra-aortic recons

**Clinical Research**

Outcomes before 1991 (no standard protocols)
- Stroke rate: 4.1%
- Death rate: 3.2%

Outcomes after 1991
- Stroke rate: 1.9%
- Death rate: 0.6%
- 5 year patency rate: 80%
- 5 year death rate: 70%

**Summary**

- Vertebral Artery Disease is under diagnosed
- Revascularization is a viable option
- Reserved for sx patients who fail med Rx
- Endo vs. Open are viable options
- Choice depends on anatomic location
- "Endo-hostility"
- In experienced hands, open surgical techniques have proven to be durable