Vascular Assessment after Routine and Complex Procedures

Carotid Intervention - Carotid Artery Stenting

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Vascular assessment after routine and complex procedures

At the conclusion of this lecture, participants will be able to:

1. Identify those who are at high risk for complications.
2. List interventions that may prevent complications.
3. Describe pertinent exam to identify complications.
NASCET Criteria for carotid stenting

- Symptomatic >50% stenosis
- Asymptomatic >80% stenosis
- Asymptomatic >50% stenosis and presence of complex plaque morphology

High risk surgical factors
- Poor cardiac function EF<305
- Stenosis with occlusion of contralateral ICA
- Tandem lesions
- Carotid dissection
- Pseudoaneurysm
- “Hostile neck”
- Surgically inaccessible lesions
- Bleeding disorders,
- Uncontrolled arrhythmias, angina
- Heart failure
- > 80 yrs of age
- Restenosis

Possible complications of carotid stenting

- Acute hemodynamic disturbances
- Peri-interventional stroke
- Myocardial infarction
- Acute renal failure
- Vessel occlusion, rupture, dissection
- Access site complications

Acute Hemodynamic Disturbances

- Disease states that alter baroreceptor function
- CAS involving carotid bifurcation / bulb
- Neurologic and cardiac complications from hemodynamic depression


Who Are At High Risk For Stroke?

Associated with perioperative stroke and death

- Age > 80 years  Female > Male
- Chronic Kidney
- Diabetes mellitus
- Symptomatic indications for stenting
- Procedure performed within 2 weeks of TIA
- Angiographic variables

Pre-procedure Interventions
Decrease Complication Risk

• Statins
• Anti-hypertensives
• Duel antiplatelet


The Well Prepared Patient
Preventing Hemodynamic Disturbances

- Fluid bolus and infusion
- Glycopyrrolate vs Atropine
- Phenylepherine
- Antihypertensives


Stroke Mimics

- **Glycemic imbalance**
  - \(<70\text{mg/dl}\) is the threshold in diabetic patient
  - \(<55\text{mg/dl}\) is the threshold in non-diabetic patient

**Symptoms**
- Confusion
- Altered behavioral patterns
- Seizure
- Coma
- Hemiplegia

Stroke Mimics

- Hypercalcemia
- Hyponatremia
- Uremia
- Hepatic encephalopathy
- Hyperthyroidism
- Infectious disorders
- Psychological disorders
Acute Stroke

- Internal Carotid Artery
- Middle Cerebral Artery
- Anterior Cerebral Artery
Internal Carotid Artery Occlusion

- If thrombus propagates up the ICA into the MCA, symptoms identical to proximal MCA occlusion
- Remember the ophthalmic artery branches off the ICA perfusing the opthalmic nerve and retina.
- SYMPTOMS:
  - Monocular blindness (amaurosis fugax)
Vascular Assessment - MCA Stroke

Pneumonic: “CHANGe”

- Contralateral paresis and sensory loss in the face and the arm
- Homonymous Hemianopia
- Aphasia
- Neglect
- Gaze preference toward the side of lesion
# MCA Stroke Distribution

<table>
<thead>
<tr>
<th>LEFT MCA</th>
<th>RIGHT MCA</th>
</tr>
</thead>
<tbody>
<tr>
<td>• Aphasia (language loss)</td>
<td>• Left hemi neglect</td>
</tr>
<tr>
<td>• Right <strong>hemiparesis</strong> (arm/face &gt; leg)</td>
<td>• Left hemiparesis</td>
</tr>
<tr>
<td>• Right <strong>sensory loss</strong></td>
<td>• Left sided sensory loss</td>
</tr>
<tr>
<td>• Right <strong>visual</strong> field cut</td>
<td>• Left visual field cut</td>
</tr>
<tr>
<td>• Left gaze preference</td>
<td>• Dysarthria</td>
</tr>
<tr>
<td>• Dysarthria</td>
<td>• Spascial disorientation</td>
</tr>
<tr>
<td>• Difficulty reading, writing or calculating</td>
<td>• Neglect of deficits “anasgnosia”</td>
</tr>
</tbody>
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Anterior Cerebral Artery Stroke

- Contralateral hemiparesis foot, leg and shoulder
- Sensory loss in contralateral toes, foot, and leg
- Disinhibition, Impulsivity
- Speech disturbance (dysarthria, aphasia)
- Short term memory loss
- Urinary incontinence usually occurs with bilateral damage

Vascular Assessment – Neuro Exam

Vascular Assessment – Neuro Exam

**Vision** – finger counting.
- Use 2 and 1 or finger movements
  - Hemianopia – Patient will miss one side
  - Neglect – Patient will look to one side
Access Complications

• AV fistula
• Pseudoaneurysm
• Arterial Dissection
• Acute limb ischemia
• Localized Hematoma

