Non atherosclerotic Arterial Disease
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Aneurysms are a common pathway for atherosclerotic and non atherosclerotic arterial diseases.
Weakening or disruption of the vessel wall.

Mycotic Aneurysm
Ileocolic artery
35 year old. Fever and abdominal pain.
Later found to have endocarditis.

EIA Aneurysm
Ehler Danlos

Ehlers-Danlos Type 4
Vascular type
- Weak vessels due to abnormal procollagen
- Arterial rupture, aneurysms, pseudoaneurysms, dissections
- Carotid-cavernous fistula
- GI perforations
- Uterine rupture

LRA Aneurysm
Ehler Danlos
**Giant cell arteritis**

- Older than 50
- Headache, temporal swelling and tenderness, jaw claudication
- Ischemic optic neuropathy from ophthalmic, ciliary or retinal arteries
- About 15% aortic involvement
- Associated with thoracic aortic aneurysm (more than half get dissection) and abdominal aortic aneurysm

**Giant cell arteritis**

- Biopsy is gold standard (acute with inflammatory infiltrate, chronic with fibrosis)
- US can guide biopsy and follow treatment
- Temporal artery Ultrasound (12-15 Mhz preferred)
- Halo sign due to edema (greater than 1.5mm)
- May be segmental or irregular distribution
- May see stenotic lesions or occlusions
- Long segment tapering lesions in the axillary, brachial, subclavian arteries
- Other vessels: vertebral, coronary, mesenteric. Less common femoropopliteal, tibioperoneal arteries

**Vasculitis**

- Autoimmune diseases with vascular wall inflammation
- Small, medium or large vessel
- Large – aorta and large branches
- Medium – mainly visceral arteries
- Renal, mesenteric, coronary
- Small – arterioles, capillary, venules

Giant cell arteritis
Examination

• High frequency of temporal arteries and its branches (parietal and frontal)

• Axillary (greater than 1 mm) and subclavian 3-15%

• Orbital vessels

• Carotid, vertebral, femoropopliteal also possible

Axillary Artery - GCA


Orbital Vessels
Normal vs GCA

Takayasu’s arteritis

• Generally under 40, especially 25-30,

• Female predominance

• Claudication, headaches, dizziness, syncope, visual changes and carotidynia, hypertension

• Absent pulses, asymmetric brachial BP

Takayasu’s

• Most common sites

• Abdominal aorta, descending thoracic and arch

• Stenosis common but aneurysms up to 45%

• Subclavian, innominate, renal, common carotid, vertebral and mesenteric arteries

CCA thickening
Macaroni sign

- Concentric wall thickening more echogenic than halo
- Macaroni sign of hypoechoic thickening
- More echogenic than GCA halo

Takayasu's
Aneurysm and thickening

Fibromuscular Dysplasia

- Nonatherosclerotic, noninflammatory arteriopathy
- May be as high as 4/100
- Woman more affected
- Age typically young to 40s, getting older
- Renal, extracranial carotid and vertebral in 65%
- Renal 58%, carotid and vertebral 32%, 10% others
- Stenosis, occlusion, aneurysm or dissection (19.7%)

Fibromuscular dysplasia

<table>
<thead>
<tr>
<th>Symptom</th>
<th>Percentage</th>
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<tbody>
<tr>
<td>Hypertension</td>
<td>64%</td>
</tr>
<tr>
<td>Headache</td>
<td>52%</td>
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<tr>
<td>Dizziness</td>
<td>26%</td>
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<tr>
<td>Aneurysm</td>
<td>14%</td>
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<tr>
<td>Cervical dissection</td>
<td>12%</td>
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<tr>
<td>TIA</td>
<td>7%</td>
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<tr>
<td>Stroke</td>
<td>7%</td>
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Cerebrovascular Fibromuscular Dysplasia

- Affects middle and distal 1/3 of ICA
- Often at level of mandibular ramus and above
- Not at origin like atherosclerosis
- Ultrasound may show stenosis at atypical location without plaque, may be too distal

S curves under 70 years old: think of FMD

Associated with intracranial aneurysms: need to evaluate intracranial circulation

Arterial Thrombus

Acute Thrombosis anechoic

PTA Embolus

Embolic Material in Central Retinal Artery

Case courtesy of Barbara Alberto, JHN