Vascular Surgical Problems in Young People

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Vascular Surgical Problems in Young People

• Thoracic Outlet Syndrome
  • Arterial
  • Venous
  • Neurogenic

• Median Arcuate Ligament Syndrome

• Nutcracker Syndrome

• Claudication in the Young
  • Popliteal Artery Entrapment
  • Medial Adventitial Cystic Disease
  • Exercise Induced Compartment Syndrome
Thoracic Outlet Syndromes
Three distinct problems

• Neurogenic
• Venous
• Arterial
Venous Thoracic Outlet

- Mean age vTOS 32
- Men = Women
- Often associated with repetitive activities
  - Baseball pitchers
  - Swimmers
  - Weightlifters
  - Carpenters
Venous Thoracic Outlet

Presentation
- Unilateral arm swelling
- Prominent venous pattern
- Heaviness, aching

Risk
- PE - low
- Phlegmasia Cereula Dolens – low
- Long-term disability - debated
Venous Thoracic Outlet

Diagnosis
- Duplex scan of the axillary and distal veins
- PA and lateral CXR, Cspine films

Treatment
- Anticoagulation
  - and then, when appropriate
- Venogram
- Thrombolysis
- First rib resection
- Venous reconstruction
Venous Thoracic Outlet
Venous Thoracic Outlet
Venous Thoracic Outlet
Arterial Thoracic Outlet

Presentation

- Heaviness, aching with exercise
- No swelling
- Radial pulse likely intact
- Signs of embolization to the fingers

Risk

- Gangrene / Tissue loss of hand and arm
- Loss of exercise function
Arterial Thoracic Outlet

Diagnosis

PA and lateral CXR, Cspine x-rays
CT angiogram of the Chest and Neck
Angiography
Arterial Thoracic Outlet
Arterial Thoracic Outlet
Arterial Thoracic Outlet

Treatment

First rib / Cervical rib resection
Arterial reconstruction
Thrombectomy distally
Neurogenic Thoracic Outlet

Presentation

Unilateral arm pain with activity
Heaviness, aching

Risk

Chronic pain, loss of function
Muscular atrophy
Complex regional pain syndrome (Reflex sympathetic dystrophy)
Neurogenic Thoracic Outlet

Diagnosis
- PA and lateral CXR, Cspine films
- Physical examination with provocative maneuvers

Treatment
- Expectant management in many cases
- Physical therapy?
- First rib resection and thoracic outlet decompression
Thoracic Outlet Operations

Left

- Suprascapular artery
- Anterior scalene muscle
- Phrenic nerve
- Internal jugular vein
- First rib
- Subclavian vein
- Subclavian artery
Thoracic Outlet Operations
Nutcracker Syndrome

• Two distinct clinical problems with a single moniker and the same pathophysiology
  • Duodenal compression
  • Left renal vein compression

• Occurs due to compression by the Left renal vein by the acute angle of the takeoff of the superior mesenteric artery
Nutcracker Syndrome
Nutcracker Syndrome
Nutcracker Syndrome

Narrow angle

Wide angle
Nutcracker Syndrome

Renal vein
Posterior to Aorta
Nutcracker Syndrome

Venogram
Shows obstruction
Of the left renal vein
Nutcracker Syndrome

- Symptoms
  - Flank pain-left
  - Hematuria (microscopic or gross)
  - Vulvar varices, dyspareunia, pelvic engorgement
  - Varicocele
Nutcracker Syndrome

• Imaging
  • CT scan
  • Venography
Nutcracker Syndrome

• Management
  • Transposition of the left renal vein more inferiorly on the IVC
  • Transposition of the gonadal vein to the IVC
Nutcracker Syndrome - Treatment
Median Arcuate Ligament Compression Syndrome

• A vascular problem?
• A neurological problem?
• Does it exist at all?
Median Arcuate Ligament Compression Syndrome

- Chronic abdominal pain
- Exacerbated by eating, change in posture
- Often weight loss
- Defies explanation after extensive evaluation
  - UGI
  - Upper endoscopy
  - Colonoscopy
  - US gall bladder
Median Arcuate Ligament Compression Syndrome
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Treatment

Median Arcuate Ligament Division
- Release of vascular compression
- Division of the celiac ganglion and neuronal fibers.
Medial Adventitial Cystic Disease

Young man with severe right Leg claudication.
Exam:
- Normal Left leg pulses
- Normal right femoral pulse and absent distal pulses. ABI R 0.50
Medial Adventitial Cystic Disease

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Medial Adventitial Cystic Disease

Right leg saphenous vein
Interposition graft

Completion angiogram:
Popliteal Artery Entrapment

Type I
- Popliteal artery
- Medial head of gastrocnemius muscle

Type II
- Popliteal artery
- Popliteal vein

Type III
- Popliteal artery
- Accessory slip of gastrocnemius muscle
- Medial head of gastrocnemius muscle

Type IV
- Popliteal artery
- Popliteal vein
- Compressed popliteal artery
- Popliteus muscle
Popliteal Artery Entrapment
Popliteal Artery Entrapment
Exercise Induced Compartment Syndrome

- Serious athlete
- Anterior compartment pain, brought about by running
- Compartment pressures can be measured after exercise
- Treatment is compartment release