45 year old with TIA
45 year old with TIA
45 year old with TIA
45 year old with TIA: Repeat Images
ICA Occlusion

RT ICA
Normal spectral waveforms
<table>
<thead>
<tr>
<th>ICA</th>
<th>ECA</th>
</tr>
</thead>
<tbody>
<tr>
<td>Low resistance</td>
<td>High resistance</td>
</tr>
<tr>
<td>No cervical branches, usually posterior lateral to ECA</td>
<td>Cervical branches</td>
</tr>
<tr>
<td>Lesser degree transmission temporal tap</td>
<td>Greater degree transmission temporal tap</td>
</tr>
</tbody>
</table>
Pitfall #1: Failure to identify correct waveforms
Learning Objectives

• Compare and contrast normal and abnormal Doppler waveforms

• Describe pitfalls in Doppler interpretation

• Apply Doppler principles to diagnose urgent vascular findings
Left facial drooping
Left facial drooping - diagnosis?
Left facial drooping - diagnosis?
Aortic and right carotid dissection
Aortic and right carotid dissection
Pearl #1: Systematic approach

- **grayscale**
- **color**
- **spectral**
- **velocities**
70 year old with a history of neurofibromatosis
Neurofibromatosis, malignant transform?
6 weeks later pre-biopsy CT
Biopsy deferred; US performed. What’s next?
Diagnosis?
Pseudoaneurysm
Pseudoaneurysm
Central line attempt: evaluate for hematoma
Evaluate neck hematoma
Evaluate neck hematoma: next?
Spectral Doppler
Aortic Balloon Pump. CCA-IJ Fistula
Pearl #2: Always turn on color
History of recent renal transplant biopsy
Renal transplant biopsy: Diagnosis?
Two months later: AV fistula gone?
Two months later: AV fistula gone?
Repeat imaging

First set of images

Repeat images same day

Effect of adjusting the scale
22 year old with scrotal pain: rule out torsion
Rule out torsion: initial images
Repeat images after scale adjustment
Pre-operative bariatric surgery
Pre-op: portal vein thrombus?
Repeat: no thrombus
Pitfall #2: Incorrect Doppler scale
Pearl #3: These 3 waveforms
Right ICA waveform?
Spectral broadening: causes?
Spectral broadening: causes?

- Turbulent flow
- Gain too high
- Doppler sample too close to wall
- Too large Doppler sample volume
Abnormal RCCA waveform?

**RIGHT**

- Carotid (Right)
- ApSV = 0.846 m/s
- IC/CC =

**LEFT**

- Carotid (Left)
- ApSV = 1.16 m/s
- IC/CC =
High resistive waveform: cause?
Causes of high resistive waveform

Stenosis distal to sampling point
Abnormal right ICA waveform?

Distal ICA

RIGHT

LEFT

CA Dist psv = 0.082 m/s
CA Dist edv = 0.031 m/s
IC/CC = 3.760

CA Dist psv = 0.728 m/s
CA Dist edv = 0.340 m/s
IC/CC = 0.785
Parvus tardus waveform: cause?

Distal ICA
Parvus tardus waveform: cause?

Distal ICA

Stenosis proximal to sampling point

Proximal ICA
Liver Transplant
Liver transplant: What’s next?

3 weeks post-op

12 weeks post-op
Liver transplant: HA stenosis
Liver transplant: 90% HA stenosis

Post angioplasty
Unusual Waveforms
LVAD

R Dist CCA
PSV 32.5 cm/s
Aortic Balloon Pump
Summary: Pearls and Pitfalls
Pitfall #1: Failure to identify correct waveforms
Pitfall #2: Incorrect Doppler scale
Pearl #1: Systematic approach

- grayscale
- color
- spectral
- velocities
Pearl #2: Always turn on color
Pearl #3: These 3 waveforms
Thank you!