Διοισοφάγεια Υπερηχοκαρδιογραφία 3 Διαστάσεων.
Στην καρδιοεμβολική νόσο

Μαρία Γ. Αγγελάκη
Επικ. Επιμελήτρια Β

ΓΝ Ερυθρός Σταυρός
Why to bother so much?

- Stroke is the third leading cause of death in Western countries.

Cardioembolic Strokes.

15-20% of ischemic stroke

Worse prognosis:

1. larger infarct size
2. abrupt onset of occlusion
3. haem. transformation
**Major risk sources**

- Atrial fibrillation
- Recent myocardial infarction
- Previous myocardial infarction (LV aneurysm)
- Cardiomyopathies
- Cardiac masses
  - Intracardiac thrombus
  - Intracardiac tumours
  - Fibroelastoma
  - Marantic vegetations
- Rheumatic valve disease (mitral stenosis)
- Aortic arch atheromatous plaques
- Endocarditis
- Mechanical valve prosthesis

**Minor or unclear risk sources**

- Mitral valve prolapse
- Mitral annulus calcification

- Calcified aortic stenosis
- Atrial septal aneurysm
- Patent foramen ovale
- Giant Lambl’s excrescences
LEFT ATRIAL APPENDAGE
Standard 2D TOE views for LAA

ME 2chamber view

ME SAX AV view

TG 2chamber view
Left atrial appendage morphology

A: Chicken wing
B: Windsock
C: Cauliflower
D: Cactus

A quite complex structure
CHICKEN WING

- 48%
- Dominant lobe
- Obvious bent
- Folding back
- ? Second lobe

WINDSOCK

- 19%
- Dominant lobe
- 2ndary lobes

CAULIFLOWER

- 3%
- Variable no. lobes
- Short length
- Complex internally
- Irregular orifice

CACTUS

- 30%
- Dominant lobe
- 2ndary lobes superiorly
Does the Left Atrial Appendage Morphology Correlate With the Risk of Stroke in Patients With Atrial Fibrillation?

Results From a Multicenter Study

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Austin, Texas; and Foggia, Turin, and Asti, Italy

OR 10.1 (95% CI 1.25 to 79.7), p=0.019
### What are we looking for?

<table>
<thead>
<tr>
<th><strong>SEC</strong></th>
<th>Low blood flow velocities. Composed of activated platelets and leukocytes or aggregated red blood cells.</th>
<th>Swirling echodensity within the atrium.</th>
<th>Anticoagulation does not reduce SEC but reduces the development of LAA thrombus. <strong>Cardioversion is acceptable.</strong> SEC can initially increase, but eventually decreases after cardioversion.</th>
</tr>
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<tbody>
<tr>
<td><strong>Sludge</strong></td>
<td>Low blood flow velocities. Viscous, gelatinous morphology, not well formed. Represents an intermediate stage between SEC and formed thrombus.</td>
<td>Anticoagulation. <strong>Cardioversion in the setting of sludge is controversial and associated with a higher risk of thrombus being present.</strong></td>
<td></td>
</tr>
<tr>
<td><strong>Thrombus</strong></td>
<td>Low blood flow velocities. Organized formed thrombus.</td>
<td>Anticoagulation. <strong>Cardioversion contraindicated with this finding.</strong></td>
<td></td>
</tr>
<tr>
<td><strong>Pectinate muscle</strong></td>
<td>Part of the normal LAA morphology.</td>
<td>No treatments, normal finding.</td>
<td></td>
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Prognostic Implications of Left Atrial Spontaneous Echo Contrast in Nonvalvular Atrial Fibrillation

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Figure 1. Cumulative freedom from stroke or other embolic events in patients with (SEC present) and without (SEC absent) baseline left atrial spontaneous echo contrast (SEC).
Interesting case 1.
multiplane
Interesting case 2.
Not necessary but impressive
Interesting case 3.
Interesting case 4.
Interesting Case 5.

57y man, HTN
1 mo symptoms (Diagnosis: Leriche syndrome)
@ surgery: emboli (abd aorta- iliac art.)
Biopsy: thrombi @ myxoid stroma
Interesting Case 6.

- 55y old woman
- Fever 38 last 3 days, Aphasia
- ECG (ST elevation V2-3, TWI V4-6, I, aVL)

<table>
<thead>
<tr>
<th>Parameter</th>
<th>Value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Ht</td>
<td>36.4%</td>
</tr>
<tr>
<td>CKMB (U/L)</td>
<td>113</td>
</tr>
<tr>
<td>WBC (K/μL)</td>
<td>10400</td>
</tr>
<tr>
<td>TROP (ng/ml)</td>
<td>2.5</td>
</tr>
<tr>
<td>NEUT</td>
<td>91%</td>
</tr>
</tbody>
</table>
Angiogram
Thrombus
Urgent TTE
TOE ...next day
3D
2015 ESC Guidelines for the management of infective endocarditis

- Embolic events may be silent in 20-50%
- Post Abx initiation the risk of new event is only 6-21%

3. Prevention of embolism

<table>
<thead>
<tr>
<th>Condition</th>
<th>Risk Level</th>
<th>Prevention</th>
</tr>
</thead>
<tbody>
<tr>
<td>Aortic or mitral NVE or PVE with persistent vegetations &gt; 10 mm after one or more embolic episode despite appropriate antibiotic therapy</td>
<td>Urgent</td>
<td>I</td>
</tr>
<tr>
<td>Aortic or mitral NVE with vegetations &gt; 10 mm, associated with severe valve stenosis or regurgitation, and low operative risk</td>
<td>Urgent</td>
<td>IIa</td>
</tr>
<tr>
<td>Aortic or mitral NVE or PVE with isolated very large vegetations (&gt;30 mm)</td>
<td>Urgent</td>
<td>IIa</td>
</tr>
<tr>
<td>Aortic or mitral NVE or PVE with isolated large vegetations (&gt;15 mm) and no other indication for surgery*</td>
<td>Urgent</td>
<td>IIb</td>
</tr>
</tbody>
</table>
Interesting case 7.
Interesting case 8.
Apply multiplane
Get the whole picture
Conclusion

TOE is an integral part of the investigation tests needed for cardioembolic disease.

3D imaging is our allay in this.