New transthoracic echocardiographic Mmode sign to detect post-cardioversion atrio auricular dysfunction: correlations with TEE

P. Colonna MD FESC, W. Kosmala MD*, M. Sorino MD, I. de Luca MD, G. Antonelli MD
Cardiology Division – Policlinico of Bari – Italy; * Wroclaw – Poland

Background

- Transesophageal echocardiography (TEE) is the gold standard to study left atrial appendage (LAA) dysfunction after cardioversion for atrial fibrillation (AF)
- Post-cardioversion LA appendage stunning is an important risk factor for embolic stroke
- In some cases a functional dissociation between left atrium contraction (A wave) and LAA emptying velocities can occur

Clinical characteristics

<table>
<thead>
<tr>
<th>Males / Females</th>
<th>36 / 29</th>
</tr>
</thead>
<tbody>
<tr>
<td>Mean age, years</td>
<td>58 (52-63)</td>
</tr>
<tr>
<td>AF previous episodes, pts</td>
<td>32</td>
</tr>
<tr>
<td>AF duration, dd</td>
<td>7.2 (3-14)</td>
</tr>
<tr>
<td>Hypertension, n</td>
<td>30</td>
</tr>
<tr>
<td>Ischemic cardiopathy, n</td>
<td>12</td>
</tr>
<tr>
<td>Cardiomyopathy, n</td>
<td>3</td>
</tr>
<tr>
<td>Other pathologies, n</td>
<td>9</td>
</tr>
<tr>
<td>Lone AF, n</td>
<td>11</td>
</tr>
<tr>
<td>Left atrial dimension, mm</td>
<td>45 (42-50)</td>
</tr>
<tr>
<td>Ejection fraction, %</td>
<td>58 (49-65)</td>
</tr>
</tbody>
</table>

Methods

- LAA was considered dysfunctioning if TEE LAAeV was < 40cm/sec
- At TEE LAA was considered dysfunctioning if:
  - a) LAAeV was <40cm/sec or
  - b) the Mmode thickening of the medial LAA wall (delta) was <-0.25 cm
- Left atrium was considered dysfunctioning if A wave at TTE transmitral Doppler was <50 cm/sec

Material

- 68 patients with a history of non valvular, persistent AF (7.2 ± 2.9 days)
- All pts with clinical indications to pharmacologic / electric cardioversion
- 3 pts excluded: 2 for LAA thrombi and 1 for complex aortic plaques at TEE

Study protocol

1. Pre-cardioversion TTE and TEE (same day)
2. Pharmacologic / electric cardioversion
3. Post-cardioversion TTE and TEE (same day), 4-8 days postC (6.6±1.8 dd)

Results

- Feasibility
  - LAA visualization was obtained at TTE:
    - with the Mmode technique in 64/65 patients (98%)
    - the LAAeV at TTE was well defined only in 51/65 patients (78%)
- LAA dysfunction (stunning):
  - At 7 days 18/65 patients showed dysfunctioning LAA, since the TEE LAAeV was <40cm/sec
- Atrio-auricular dissociation:
  - the A wave at TTE was normal in 6 of the 18 pts (33%) with LAA dysfunction at TEE

Conclusions

- Among patients studied 7 days after AF cardioversion (gold standard TEE LAAeV):
  - TTE transmitral A wave is not very sensitive to detect LAA dysfunction, because of atrio auricular dissociation
  - TTE LAAeV is sensitive, but with low feasibility
- The new TTE Delta Mmode is highly sensitive and highly feasible for dysfunction detection

How to measure TTE Delta (Δ)

- Linear regression TTE Delta (Δ) / TEE LAAeV

References


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