Atrial Fibrillation – What are the Options in 2016?

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Disclosures

• Consulting, Biosense Webster
Overview

• What is AF?
• AF Burden
• Therapeutic considerations
  • CVA risk and anticoagulation
  • Rate versus rhythm control
  • How to achieve rhythm control
• An illustrative case
• Conclusions and questions
What Is AF?
“But I ... have noticed, that after the heart proper, and even the right auricle were ceasing to beat and appeared on the point of death, an obscure movement, undulation/palpitation had clearly continued in the right auricular blood itself for as long as the blood was perceptibly imbued with warmth and spirit.”

William Harvey, *Exercitatio anatomica de motu cordis et sanguinis in animalibus*, 1628
SPONTANEOUS INITIATION OF ATRIAL FIBRILLATION BY ECTOPIC BEATS ORIGINATING IN THE PULMONARY VEINS

AF Burden
Scope of the Problem

• Magnitude
  • Over 3 million patients in the US with AF
  • Projected 5.6 million in US with AF by 2050

• Cost
  • Correlation with stroke, heart failure, mortality
  • Increasing toll on health care economics

• Increasing burden of risk
  • Longevity, obesity, diabetes

Increasing Burden

Mortality trends in patients with AF

Therapeutic Considerations
Related but Distinct Discussions

- Reduction of CVA risk
  - CHA$_2$DS$_2$-VASC scoring
  - Warfarin
  - NOAC therapy
  - LAA occlusion

- Rate-versus rhythm-control strategies
  - Symptoms
  - Patient characteristics
    - Age
    - Duration of AF
    - LA size; substrate
    - Comorbidities
  - Antiarrhythmics versus ablation
CHADS$_2$ and CHA$_2$DS$_2$-VASC

<table>
<thead>
<tr>
<th>CHADS$_2$-VASc Score</th>
<th>Stroke Risk %</th>
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<tr>
<td>0</td>
<td>0</td>
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<tr>
<td>1</td>
<td>1.3</td>
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<td>2</td>
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<td>3</td>
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<td>6.7</td>
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<td>6</td>
<td>9.8</td>
</tr>
<tr>
<td>7</td>
<td>9.6</td>
</tr>
<tr>
<td>8</td>
<td>6.7</td>
</tr>
<tr>
<td>9</td>
<td>15.2</td>
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Warfarin and NOACs


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**Figure 1. Cumulative Hazard Rates for the Primary Efficacy and Safety Outcomes, According to Treatment Group.**

Panel A shows the cumulative hazard rates for the primary efficacy outcome (stroke or systemic embolism), and Panel B the rates for the primary safety outcome (major bleeding) in the apixaban and aspirin groups.
Conundrum of Shared CVA and Bleeding Risks

<table>
<thead>
<tr>
<th>CHADS₂ Score</th>
<th>N</th>
<th>Person-Years</th>
<th>Rate (per 100 Person-Years)</th>
<th>95% Cl</th>
<th>N</th>
<th>Rate (per 100 Person-Years)</th>
<th>95% Cl</th>
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<tbody>
<tr>
<td>Overall</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>0</td>
<td>42</td>
<td>32</td>
<td>1.32</td>
<td>0.08 to 17.38</td>
<td>5</td>
<td>15.59</td>
<td>5.06 to 36.39</td>
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<td>1</td>
<td>121</td>
<td>93</td>
<td>4.12</td>
<td>1.17 to 10.96</td>
<td>16</td>
<td>17.12</td>
<td>9.79 to 27.81</td>
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<tr>
<td>2</td>
<td>181</td>
<td>147</td>
<td>2.04</td>
<td>0.42 to 5.96</td>
<td>19</td>
<td>12.92</td>
<td>7.78 to 20.18</td>
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<tr>
<td>3</td>
<td>94</td>
<td>61</td>
<td>19.54</td>
<td>10.10 to 34.13</td>
<td>20</td>
<td>32.56</td>
<td>19.89 to 50.29</td>
</tr>
<tr>
<td>≥4</td>
<td>34</td>
<td>26</td>
<td>23.42</td>
<td>8.59 to 50.97</td>
<td>9</td>
<td>35.12</td>
<td>16.06 to 66.68</td>
</tr>
<tr>
<td>Total</td>
<td>472</td>
<td>26</td>
<td>23.42</td>
<td>8.59 to 50.97</td>
<td>69</td>
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Proliferation of LAA Exclusion Devices

- Amplatzer
- Watchman
- Lariat

Rate versus Rhythm control
AFFIRM

Figure 1
Comparison of Composite Principal Outcome: Individual AADs Versus Rate

Rhythm Control for AF

Amiodarone versus Other AADs

AAD Efficacy

Rhythm control: Surgical Maze

Dr. James Cox, Wash. Univ.
Evolution of Catheter Ablation

Equally Effective Modalities

What to Do with Persistent AF?

Ablation Complications - JHH

Catheter ABlation vs ANtiarrhythmic Drug Therapy in Atrial Fibrillation (CABANA) Trial

Douglas L. Packer, MD
Kerry L. Lee, PhD
Daniel B. Mark, MD
Richard A. Robb, PhD
CABANA Investigators

Mayo Clinic Rochester
Duke Clinical Research Institute
National Heart Lung and Blood Institute
A Case from Our Host

- 70yo woman
- AF
- CAD, EF 40%
- Chronic liver disease, s/p therapy for Hep C
- Never anticoagulated
- Symptomatic with dyspnea
Considerations

<table>
<thead>
<tr>
<th>CVA risk reduction</th>
<th>Rate v. rhythm control</th>
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<tr>
<td>• CHADS VASC score of 4 (at least)</td>
<td>• Dependent on:</td>
</tr>
<tr>
<td>• Possible liver dysfunction, risk of GIB, coagulopathy</td>
<td>• Symptoms</td>
</tr>
<tr>
<td>• Suggest trial of NOAC or warfarin</td>
<td>• LA size</td>
</tr>
<tr>
<td>• LAA occlusion if GIB or other issues prevent anticoagulation, given moderate/high risk of CVA</td>
<td>• Type of AF (PAF v. persistent)</td>
</tr>
<tr>
<td></td>
<td>• Duration of continuous AF</td>
</tr>
<tr>
<td></td>
<td>• Contraindications to</td>
</tr>
<tr>
<td></td>
<td>• Amiodarone (if liver dysfunction an issue)</td>
</tr>
<tr>
<td></td>
<td>• Flecainide (ischemic CMP)</td>
</tr>
<tr>
<td></td>
<td>• Multaq (EF reduced, with CHF symptoms)</td>
</tr>
<tr>
<td></td>
<td>• Possible use of Sotalol or Tikosyn</td>
</tr>
<tr>
<td></td>
<td>• Consideration of ablation</td>
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Summary

• AF is a common and increasing problem
• Central questions include:
  • CVA risk reduction
  • Rate versus rhythm control
• Novel developments include
  • New oral anticoagulants
  • LAA occlusion devices
  • Improved ablation modalities
• Ongoing challenges include:
  • Improving ablation outcomes, particularly for persistent AF; early intervention
  • Understanding different types of AF, and how to treat accordingly