Surgeons Role in Atrial Fibrillation

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Atrial Fibrillation

- Stages of Atrial Fibrillation
  - Paroxysmal (Intermittent)
  - Persistent (Continuous)
  - Longstanding Persistent
    - (>1 year)

- Updated Stages
  - Paroxysmal (PAF)
  - Non-Paroxysmal (N-PAF)

Demographics of Atrial Fibrillation

- Over 2.5 million Americans affected
- Approximately 160,000 new cases annually
- Incidence increases with age
  - Doubles with each decade of life

Annual Utilization of Health Care Resources Due to AF

- 350,000 hospitalizations
- 5.0 million office visits
- 276,000 emergency department visits
- 234,000 hospital outpatient department visits
- $26 Billion annually in US alone
- $8,700 annually per patient with AF
Cardiovascular Complications In AF Patients Are More Common

<table>
<thead>
<tr>
<th>COMPLICATIONS</th>
<th>PREVALENCE</th>
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<tbody>
<tr>
<td>Heart Failure</td>
<td>3 X Higher</td>
</tr>
<tr>
<td>Stroke</td>
<td>2 X Higher</td>
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<tr>
<td>Chest Pain</td>
<td>2 X Higher</td>
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<tr>
<td>Tachycardia</td>
<td>5 X Higher</td>
</tr>
<tr>
<td>Palpitations</td>
<td>3 X Higher</td>
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<tr>
<td>Acute Myocardial Infarction</td>
<td>2.5 X Higher</td>
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Current Therapy Approach

- Medical
  - Anticoagulation
  - Cardioversion
  - Rate control
  - Rhythm maintenance
- Interventional
  - Ablate the AV node and Pace
  - Left Atrial Ablation
- Surgical
  - Left or Bi-Atrial Ablation
  - LAAM

Indications for Interventional or Surgical Ablation

- Medication failure
- Medication intolerance
- Anticoagulation contraindication
- Stroke or TIA on anticoagulation
- Previous failed catheter ablation
- Patient with AF undergoing other heart surgery
- Patient prefers a more aggressive approach

Focal vs. Non-Focal Arrhythmias

- **Focal**
  - Micro-Reentrant Focus
  - “Small-Rotor”

- **Non-Focal**
  - Macro-Reentrant Circuit
  - “Large-Rotor”
Completed Maze-IV Procedure

Objective of the Maze IV Lesions

Patient Selection to Treat Concomitant AF

1. **CABG** patients with AF
2. **AVR** patients with AF
3. **Mitral** patients with AF

Current Treatment of Concomitant AF

Source: Agency for Health Care Quality and Research (AHRQ)
Cost and Utilization Project Nationwide Inpatient Sample 2009
Under Treatment by Procedure

Coronary Artery Bypass with AF Diagnosis
- 55,000 (93%)
- 4,000 (7%)

MV/Aortic Valve Procedures with AF Diagnosis
- 27,000 (61%)
- 17,000 (39%)

Source: Agency for Health Care Quality and Research (AHRQ)
Cost and Utilization Project Nationwide Inpatient Sample 2009

Is Risk Increased?

Do we increase the operative risk by adding the Cox Maze III procedure to aortic valve replacement and coronary artery bypass surgery?
Ad N, Henry L, Hunt S, Holmes SD
Inova Heart and Vascular Institute, Cardiac Surgery Research, Falls Church, VA

“The addition of the Cox Maze III procedure to AVR or CABG did not convey an increase in major morbidity and perioperative risk ... The Cox Maze III may significantly improve their outcome.”

Restoration of Normal Sinus Rhythm

Treated AF

Untreated AF

Consensus Recommendation of Societies

2012 Consensus Statement on Surgical AF:

“It is advisable that all patients with documented AF referred for other cardiac surgeries undergo a left or biatrial procedure for AF at an experienced center, unless it…will add significant RISK…”

Heart Rhythm Society
American College of Cardiology
American Heart Association
Society of Thoracic Surgeons
European Heart Rhythm Association
European Cardiac Arrhythmia Society
Surgical ablation as treatment for the elimination of atrial fibrillation: a meta-analysis.

The LAA and Strokes

90% Ischemic
10% Hemorrhagic
20% are Associated with AF
95% have LAA Thrombi

= 130,000 Strokes / yr

Success rates reported for Bi-Atrial Lesions and LA Lesions only

Comparative Perioperative Stroke Rate

All Strokes (100%)

CABG + MVR
CABG + AVR
CABG + MV Repair
AVR + MVR
MV Repair
MVR
AVR
CABG
Maze + Above

National Adult Cardiac Surgery Database
LAA Surgical Occlusion

LAA Exclusion Without A Maze
- Lone AF pt with contraindication to OAC and not a candidate for a Maze Procedure
- Lone AF pt who develops CVA/TIA while on OAC
- LAA Exclusion as a standalone procedure
  - Thoracoscopic use of the AtriClip
  - One hour operative time, extubate in OR
  - CICU vs CTU
  - POD1 Discharge
  - Previous OHS not necessarily a contraindication

Technologies for Surgical Ablation
- Bipolar Radiofrequency
- Microwave
- Laser
- Unipolar Radiofrequency
- Cryoablation
- High frequency ultrasound

Summary
1. There are a number of documented advantages in treating concomitant AF at the time of CABG, MVR and AVR surgery.
2. All of the major societies agree that concomitant AF should be treated at the time of other cardiac surgery.
3. The Left Atrial Appendage should be occluded in every patient who has AF.
4. Every caregiver has a role in AF management.
Online Resources

- stopafib.org
- afstat.com
- treatafib.org
- Heart-valve-surgery.com

Thank You!

Questions?