Perimitral Atrial Flutter: Further Characterization and Ablation by Superior Mitral Isthmus Block

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Background

- Frequently reported post AF ablation

- Rx: “Mitral isthmus” ablation
  - Mitral annulus – LI PV
  - Endo + epicardial RF application (CS 75% pts)
Patients

586 consecutive pts with AFL Abl

57 pts LA AFL Abl

30 pts PM AFL Abl (53%)
Methods (1)

- **Ensite-NavX®**

- **Catethers**
  - Abl 4 mm LA -> irrigated tip
  - 24-pole LA
  - 4-10 pole CS
  - 2-pole RA (active fixation, reference)

- **Single transeptal puncture**
Methods (2)

- **3D Navigation system:**
  - Geometry reconstruction
  - PPI Map
  - Voltaje Map & Activation Map

  (retrospective activation map postAbl)
Methods (3)

- **Dx:**
  - ≥4 PM pacing sites: AFL CL – FPPI <10 ms
  - Congruent PM activation (spanning AFL CL)

- **Confirmation**
  - AFL termination by RF application
Methods (4)

Ablation

- **Cath:**
  - 4 mm -> irrigated tip

- **Target:**
  - **Focal:** slow conduction zone
  - **Lineal:** mitral annulus – RS PV
    ("superior mitral isthmus")
Results

- 30 pts: 67.8±9.6 yo, 14 male
- 26 pts: clinical arrhythmia
- 21 pts: hypertension
- Underlying disease:
  - 11 Mitral valve disease
  - 2 CAD
  - 1 DCM
  - 14 Hypertension without SHD
  - 2 post AF ablation
Results

- **AFL CL:** \(312 \pm 80 \text{ ms}\)
  
  (range 220-540 ms)

- **AFL Rotation**
  - CW: 17 pts
  - CCW: 13 pts
Results

- Atrial scar: 0.01 mV
  - 100% pts
  - Location: anteroseptal (29 out of 30)
Results
Ablation

- **Inferior mitral isthmus**: 4
  - Failure: 3
  - Success: 1 (early recurrence)

- **Superior mitral isthmus**: 26
  - Failure: 1
  - Success: 25 (focal in 7)

Success = 91%
Success = 25%
Activation Map
FPPI Map
Activation Map
Voltage & FPPI Maps
Results
Ablation

- Complications:
  - Tamponade: 1 pt

- Re-dos:
  - 1 previous failure -> success
  - 1 recurrence -> success
Results

F-U

- no other PM AFL recurrences
- But:
  - 2 pts LA AFL other location
  - 1 pt RA AFL (CTI dependent)
  - 2 pts AF
  - 1 pt SSS
Conclusions

- PM AFL predominant LA AFL mechanism
- Many patients only have hypertension
- Ablation:
  - Superior mitral isthmus is alternative to conventional ablation
  - Some can be ablated by focal RF application
Thank You