Pacing Maneuvers for Prevention of Atrial Arrhythmias

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No Disclosures
Ongoing management of SVT in ACHD patients.

Assess hemodynamic abnormalities and intervention as indicated for structural defects (Class I)

Treatment strategies:

- Beta blockers, sotalol, and/or catheter ablation (Class IIa)
- Pre-op or intra-op ablation of accessory pathways or atrial tachycardia for repair of Ebstein anomaly (Class IIa)
- Surgical ablation for planned surgical repair (Class IIa)
- Amiodarone, dofetilide, or atrial pacing (Class IIb)

Bradycardia and Arrhythmia Vulnerability

- Evaluated sinus node dysfunction in CHD pts (mean age 9 yrs) with and without AFL

- Pts with AFL had:
  - Lower average heart rate
  - Reach lower maximum heart rates during exercise
  - Lower chronotropic index

- Suggested that chronotropic incompetence is related to late post-operative AFL

- Bradycardia-mediated remodeling enhances the vulnerability for AFL

Susceptibility to Pace Termination of Flutter

- 65 consecutive patients referred for pace termination of atrial flutter
- Normal sinus rhythm restored in 38 (65%)

  - Of 20 patients whose flutter was precipitated by heart surgery, 19 (95%) were successfully pace terminated.

- Pace termination was successful in only 47% of the nonsurgical pts (P < .001)

*Peters et al, Am Heart J 1999;137:100-3*
Efficacy of atrial arrhythmia detection and ATP using the Medtronic AT500

- 28 patients with congenital heart disease
  - age 30 ± 18 years
- 15 patients with atrial arrhythmias
  - 14 had atrial tachycardia appropriately detected
- 167 treated episodes
  - successfully converting 90 (54%)

- Rhythms classified as ventricular tachycardia were detected 127 times, yet most were actually atrial or sinus tachycardia with 1:1 atrioventricular conduction.
Atrial ATP using the Medtronic AT500 pacemaker
MINERVA

• Randomized 1166 pts with AT/AF and indications for dual chamber pacing to:
  • DDDR
  • DDDRP + MVP
  • MVP

• Study funded by Medtronic
MINERVA: “Reactive ATP”

- AT/AF irregular (207 bpm)
- Failed 1st ATP
- AT/AF regular (182 bpm)
- ATP terminated
MINERVA: Primary Endpoint

Log-rank test

DDDRP+MVP vs. Control DDDR: $P=0.04$
MVP vs. Control DDDR: $P=0.12$
DDDRP+MVP vs. MVP: $P=0.63$
A Log rank test

- DDDRP+MVP vs. Control DDDR: $P=0.001$
- MVP vs. Control DDDR: $P=0.71$
- DDDRP+MVP vs. MVP: $P=0.004$

Number at risk:
- Control DDDR: 383
- DDDRP+MVP: 373
- MVP: 389
Log rank test

DDDRP+MVP vs. Control DDDR: $P<0.001$
MVP vs. Control DDDR: $P=0.49$
DDDRP+MVP vs. MVP: $P=0.002$

Number at risk

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<th>Observation period (months)</th>
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<tr>
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<tr>
<td>MVP</td>
<td>389</td>
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Log rank test

DDDRP+MVP vs. Control DDDR: $P=0.003$
MVP vs. Control DDDR: $P=0.39$
DDDRP+MVP vs. MVP: $P=0.03$

Number at risk

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</tbody>
</table>
Persistent of Permanent AF

Padeletti et al. Heart Rhythm 2015 12, 1717-1725 DOI: (10.1016/j.hrthm.2015.04.015)
Pacing Potential:

- Bradycardia pacing in SND to prevent remodeling may offer some protection

- ATP-enabled pacing may limit AT episodes
Thank You