Long Term follow-up of VDD pacemaker leads and VDD pacing in pediatric population

Shimon Rosenheck, Jeffrey Banker, Zehava Sharon, Alexey Weiss
Heart Institute, Hadassah Hebrew University Medical Center, Jerusalem, Israel
VDD pacing In Pediatric Patients

- Feasibility of VDD pacing in children/adolescents
- Intermediate-time follow-up favorable
- Controversies in regard to endocardial/epicardial implantations
- Improved performance of epicardial leads vs. two decades ago
- Purpose: Long-term follow-up of VDD pacing in children/adolescents and effect on LV function


Rosenheck et al. Pacing Clin Electrophysiol 2000;23:1226-1231
Methods

- Since January 6, 1994, VDD pacemaker implanted in 25 children/adolescents
- All implanted using left subclavian vein approach
- Follow-up every six months
- Replacements when ERI indicated
- Lead replacement/extraction when indicated
- Upgrade to CRTP if LV function deteriorated
Patients

- 25 patients, 19 male and 6 female
- Age at implantation: 6 months – 16 years
- Mean Follow-up 13±5 years (longest follow-up>19 Years)
- Majority had surgically corrected congenital heart disease – 20
- Congenital AV Block – 5
Results

**Group 1.**

- Same original Single Pass lead for 13±5 years 14 patients:
  - 3 no replacement
  - 9 1 replacement
  - 2 2 replacements

All had excellent thresholds and impedances
Results (cont.)

**Group 2.**

- Upgrades integrating the Single Pass lead in 3 patients:
  - 1 upgrade to DDDR (atrial lead addition) after 8 years
  - 1 upgrade to CRTP after 11 years
  - 1 upgrade to ICD after 2 months
Results (cont.)

**Group 3.**

- Single Pass lead failure and replacement:
  - 4 new Single Pass lead with extraction of the original lead
  - 2 addition of new ventricular lead and use of the atrial sensing of the original Single Pass lead
Results (cont.)

**Group 4 and 5.**

- Each group with one patient:

  1. Single Pass lead failure with replacement with atrial and ventricular leads and need for upgrading to DDDR

  1. Recurrent infection X4 and downgrade to VVIR and epicardial lead
Results Summary

- 68% of functioning original Single Pass lead
- 16% replacement of the Single Pass lead and extraction of the original lead
- 8% addition of ventricular lead and use of the atrial sensing of the original Single Pass lead
- 4% Replacement with two leads and upgrade
- 4% Downgrading to VVIR
VDD Pacing Survival

![Graph showing fraction survival over months. The x-axis represents months ranging from 0 to 250, and the y-axis represents fraction survival ranging from 0 to 1. The graph shows a decreasing trend in fraction survival over time.]
Single Pass Lead Survival
Conclusions

- VDD pacemaker leads in the pediatric population are feasible and have reasonable longevity
- Rarely do these patients develop need for atrial, or biventricular pacing
- Long-term durability is about 68% in our experience
- This remains our center's lead of choice for this population