4:45 p.m.

862-4 **Robotically-Assisted Ventricular Resynchronization Therapy Following Failed Coronary Sinus Cannulation**

Joseph J. DeRose, Jr., Robert C. Ashton, Jr., Scott Belsley, Roxana Shaw, Daniel G. Swistel, Jonathan Sackner-Bernstein, Jonathan S. Steinberg, St. Luke's- Roosevelt Hospital Center, New York, NY, Columbia University College of Physicians and Surgeons, New York, NY

Background: Approximately 10% of patients undergoing biventricular pacemaker insertion have a failure of coronary sinus (CS) cannulation. We hypothesized that biventricular pacing could be performed in these patients using a robotically assisted, direct left ventricular (LV) epicardial approach.
Methods: Seven patients with congestive heart failure (NYHA class 3.4 ± 0.5) and a widened QRS (175 ± 21 msec) underwent robotic LV lead placement following failed coronary sinus cannulation. Mean patient age was 69 ± 11 years, LV ejection fraction (EF) was 13 ± 7% and left ventricular end diastolic volume was 6.3 ± 0.5 cm. Two patients had prior cardiac surgery and 5 patients had a prior device implanted.
Results: Thirteen epicardial leads were successfully placed on the posterolateral surface of the LV in the 7 patients. Intraoperative lead threshold was 1.1 ± 0.6 V at 0.5 ms, R-wave was 15.8 ± 6.5 mV, and impedance was 1074 ± 301 ohms at 0.5V. Complications included one post-operative pneumonia and one episode of ventricular tachycardia in a patient with an AICD. Improvements in exercise tolerance (5 of 7 patients), ejection fraction (19 ± 10%) and QRS duration (152 ± 16 msec) have been noted at 16.5 ± 5.0 weeks follow-up. Lead thresholds have remained unchanged (1.8 ± 1.1 V at 0.5 ms, p=NS), and a significant drop in impedance (310 ± 54 ohms, p=0.005) has been measured.
Conclusions: Robotic LV lead placement is an effective technique which can be used for ventricular resynchronization therapy in patients with no other minimally invasive options for biventricular pacing.

ORAL CONTRIBUTIONS

873 New Perspectives in Implantable Cardioverter-Defibrillator Therapy

Wednesday, April 02, 2003, 8:30 a.m.-10:00 a.m.
McCormick Place, Room S402

8:30 a.m.

873-1 **Survival of Dialysis Patients After Cardiac Arrest in the United States: The Impact of Implantable Cardioverter Defibrillators**

Charles A. Herzog, Jennie Z. Ma, Allan J. Collins, Nephrology Analytical Services, Minneapolis, MN, Minneapolis Medical Research Foundation, Minneapolis, MN

Sudden cardiac death is the single largest cause of mortality in dialysis pts. There are no published data on the impact of implantable cardioverter-defibrillators (ICD) on the survival of dialysis pts with cardiac arrest. We searched the records (claims data) of 1,285,177 pts in the 100% ESRD (end-stage renal disease) sample of the Medicare database and identified 15,531 dialysis pts hospitalized for cardiac arrest in 1996-2000. The survival of pts discharged alive receiving ICD within 30 days of cardiac arrest was compared to pts discharged alive without ICD, using life table method and a comorbidity-adjusted Cox model.
Results: ICD was used in 167 pts, and 3,380 pts were discharged alive and received no ICD. Of the 3547 pts, 48% were male, 56% 65+ yrs old, 61% white, 53% diabetic ESRD, and 77% prior CHF. Predictors of death included older age, race (white), diabetes (DM), CHF, and no ICD. The Table shows survival and predictors of death. **Conclusion:** The survival of dialysis pts with cardiac arrest is markedly improved by ICD. These data strongly suggest under-utilization of ICD in ESRD pts.

	Survival (%)			Predictors of All-Cause Death			
	1yr	2yr	3yr	Variable	RR	(95% CI)	P
ICD (n=167)	61.8	49.4	31.6	Age 75+	1.67	(1.40,1.99)	<.0001
No ICD (n=3,380)	40.4	26.2	17.9	Male	1.16	(1.07,1.25)	.0003
				Race(Black)	0.82	(0.76,0.90)	<.0001
				DM	1.20	(1.10,1.32)	<.0001
				ICD	0.53	(0.43,0.66)	<.0001

8:45 a.m.

873-2 **Implantable Cardioverter Defibrillator Lead Complications and Laser Extraction in Children and Young Adults With Congenital Heart Disease**

Joshua M. Cooper, Elizabeth A. Stephenson, Charles I. Berul, Edward P. Walsh, Laurence M. Epstein, Brigham & Women's Hospital, Boston, MA, Boston Children's Hospital, Boston, MA

Background: Implantable cardioverter-defibrillators (ICDs) are being implanted in children and young adults with congenital heart disease (CHD) for primary and secondary prevention of sudden death. ICD leads, over time, become adherent to venous endothelium and endocardium through the growth of scar tissue. This lead binding has unique implications in a growing patient. Lead removal, when necessary for lead infection or fracture, requires disruption of the adherent fibrous tissue. **Methods:** We retrospectively reviewed our experience with ICD lead complications and extraction in children and young adults with CHD. Multiple implantation and extraction parameters were analyzed in this cohort, including demographics, cardiac anatomy, duration of implantation, indications for removal, and extraction procedure details. **Results:** From April 1999 through January 2002, 14 patients underwent 15 lead extraction procedures to remove 21 leads (17 ICD leads and 4 pacing or sensing leads). Seven patients had surgically-corrected structural heart disease (5 transposition of the great arteries with atrial switch repair, and 2 corrected tetralogy of Fallot). The mean patient age at extraction was 17.9 ± 5.7 years (9 to 32 years), and the mean duration of lead implantation was 42.0 ± 18.9 months (15 to 75 months). Fourteen of 15 procedures were performed for lead fracture or failure. Binding of the proximal high voltage electrode, with coil stretching and fracture over time, is a newly-reported finding. A laser sheath was used for 20 of 21 lead extractions. Twenty of 21 leads (95%) were completely extracted. There were three instances of blood loss requiring transfusion. There were no major complications or deaths. Use of a laser sheath in the 5 patients with atrial switch repair of transposition of the great arteries did not result in baffle injury. **Conclusions:** Young CHD patients with an ICD are at risk for growth-related lead distortion and fracture. The use of a laser sheath is safe and effective for ICD lead extraction in CHD patients, despite the issues of coil adherence and altered cardiac anatomy. It may be advisable to implant single rather than dual coil ICD leads in patients with the potential for future growth.

9:00 a.m.

873-3 **Frequency and Timing of Defibrillator Events in Patients Without Documented Arrhythmias: Who Is at Highest Risk?**

Andrea M. Russo, Sanjay Dixit, Ralph J. Verdino, Hemal Nayak, Joseph Poku, Jamie Springman, Laurent Lewkowiez, Francis E. Marchlinski, University of Pennsylvania Health System, Philadelphia, PA

Background: The frequency of appropriate implantable cardioverter defibrillator (ICD) events in patients (pts) presenting with sustained ventricular arrhythmias (VAs) is well established. However, the frequency and timing of ICD events in other populations is not well described. Methods: We examined ICD events in 3 populations: Group 1 sustained VAs, Group 2 nonischemic dilated cardiomyopathy (DCM) and syncope, and Group 3 asymptomatic nonsustained ventricular tachycardia, coronary disease and left ventricular dysfunction. Results: (*p<0.05, compared to group 1)
Conclusions: (1) The overall frequency of VAs is greatest in pts with clinically documented VA prior to ICD implantation. (2) Compared to pts with sustained VAs, (a) pts with DCM and syncope were as likely to have VAs detected, despite shorter follow-up; (b) asymptomatic pts with coronary disease appeared less likely to have VAs detected, but this may be due to the much shorter median follow-up. (3) The time to the 1st sustained VA event was not significantly different in all 3 groups. These data support continued ICD implantation for both primary and secondary prevention.

	Group 1	Group 2	Group 3
N=	53	46	51
Age, mean	63 +/- 13	60 +/- 15	70 +/- 9*
LVEF, %	30 +/- 10%	25 +/- 9%*	29 +/- 9%
Inducible sustained VAs, % pts	61%	37%*	92%*
Median follow-up, days	838	436*	393*
% pts with sustained VAs detected by ICD	32%	33%	24%*
Total # VA detections	1110	59*	27*
# days to 1st detection, mean	360	282	510
Survival, % pts	85%	93%	80%
% pts with inappropriate ICD detections	28%	24%	10%