Independent of pacing indication, pts with LBBB had a significantly higher HF/mortality rate when paced DDOR v VVI (p<0.03). There was no significant difference in those without LBBB.

Conclusions: The presence of SO1 for pacing in defibrillator pts does not affect the HF/mortality recurrence or the combined endpoint of death or HF, although pts with SO1 tend to have increased HF admissions. DDOR pacing dramatically increases the HF/mortality endpoint in pts with LBBB, mimicking main trial results.

1147-216 Electro surgical Dissection for Extraction of Chronically Implanted Pacemaker and Defibrillator Leads

Muhammad F. Jan, Manoj M. Panigy, Tanveer Paddar, Christine Saari, Farooq Paddar, Steven P. Kutaile, Hahnemann University Hospital, Drexel University College of Medicine, Philadelphia, PA

Background: The major hurdle in the extraction of chronically implanted leads is their fibrotic attachment to the vascular and cardiac structures. Mechanical devices, such as looking stylets and telescoping non-powered sheaths, are effective but may not pass through dense fibrosis. Laser sheaths can dissect areas of heavy non-calcified fibrosis, though not without complications from circumferential lesions. The electro surgical dissection sheath (EDS), the newest device available for lead extraction, allows directional, non-circumferential delivery of radiofrequency energy to ablate fibrotic tissue. There currently remains a lack of evidence to support the efficacy and safety of the EDS for lead extraction.

Methods: Data from 56 consecutive patients (67 ± 15 years of age) requiring lead extractions at our institution was prospectively collected. The EDS (Cook Vascular) was used to extract 80 chronically implanted leads. The average duration of implantation was 8.2 years; 95% of the patients had pacemaker leads, and 5% of the patients had defibrillator leads. Patients were followed up at one and six weeks post-procedure for detection of any post-operative or late complications.

Results: 78 of 80 leads (97.5%) were completely extracted; the two incompletely extracted leads were in the same patient. The time mean required to achieve a successful lead extraction was 22.5 ± 17.2 minutes from the time the lead was cut until its removal. A total of five patients (6.2%) had intra-operative complications including two patients with bleeding at the operative site requiring transfusion, one flail tricuspid valve leaflet without hemodynamic sequelae, one hemopericardium requiring pericardioce- sis, and one hemotorax from a SVC tear which resulted in death after an emergent thoracotomy was performed.

Conclusion: In patients with a long duration of pacemaker or defibrillator implantation, the use of the EDS to assist lead extraction results in a high success rate with an accept- able procedure time. The advantage of this lies in its ability to selectively dissect areas of heavy fibrosis; however, the risk of complications remains similar to that of other powered sheaths.

Do Abandoned Leads Pose Risk to Implantable Defibrillator Patients?

Monica L. Martin, Michael Gikson, David O. Hodge, Amy L. Beeman, Win K. Shen, Samuel J. Asirvatham, Robert F. Rea, David L. Hayes, Stephen C. Hammill, Paul A. Mueller, Mayo Clinic Rochester, MN, Sheba Medical Center, Tel Hashomer, Israel

Background: Due to lead failure or upgrade from pacemaker (PM) to defibrillator (ICD), implanters often face the dilemma of choosing whether to extract or cap old leads. Argu- ments supporting removal include the risk of electrical noise, increased defibrillation threshold or venous obstruction caused by unused leads. We sought to determine the rate of these complications in patients (pts) with abandoned leads.

Methods and Results: We retrospectively reviewed the prospectively collected Mayo Clinic ICD database. Pts (n=64) were found to have 108 leads capped between 10/94 and 12/00, and 18 of these leads were capped during follow-up (n=6, 9%) end-stage disease (52%, 81%), both (5, 8%), or SQ patch only (1, 2%). Abandoned leads were right atrial ventricular (ICD) (n=27), RV pacing (26), SVC coil (12), CS coil (1), right atrial pacing lead (12), epicardial patch (13), epicardial pace/sense (11), and subcutaneous patches (4). Reas- sons for capping included lead defect (fracture or insulation break) in 47 pts, elevated defibrillation threshold in 9, upgrading from PM to ICD in 30, upgrading from epicardial to transvenous system in 9, upgrading to an active-kan ICD in 5, and other in 8. Newly placed leads were true bipolar sensing in 18/63 (30%) of cases, and active fixation in 32/63 (50%).

With a mean follow up of 25 ± 16 months after capping, 1 pt developed pocket infection, 1 pt developed pocket infection, and 1 pt developed T wave oversensing; there were no other complications. Before capping 11 pts had received inappropriate shocks; no patients received them post caps- ing. No leads were removed at the post cap visit. 11 pts removed their ICD before and after lead capping were 13 ± 7 (n=42 pts) and 14 ± 5.3 (n=64), respectively (p=NS).

Conclusions: Complications in ICD systems following capping of unused leads are uncommon. Capping rather than extraction of unused leads can often be safely consid- ered.

1148 Insights From Clinical Electrocardiography

Tuesday, March 09, 2004, Noon-2:00 p.m.
Morial Convention Center, Hall G
Presentation Hour: 1:00 p.m.-2:00 p.m.

1148-207 Quantification of Atrial Fibrillation Organization From the Surface Electrocardiogram

Daniela Husser, Martin Stridh, Leif Sorenmo, Bertil Otisso, Christoph Geller, Helmut U. Koen, Andreas Bollmann, Otto-von-Guericke University, Magdeburg, Germany, Lund University, Lund, Sweden

Background: The dominant atrial fibrillatory rate obtained from the surface ECG during atrial fibrillation (AF) has recently been suggested to reflect atrial refractoriness and to predict responses to antiarrhythmic drugs and electrical cardioversion. More recently, time-frequency analysis (TFA) taking atrial rate variability and AF organization into account, has been developed. This study explored the potential value of TFA for (1) mon- itoring antiarrhythmic drug action and (2) predicting AF recurrence following cardiover- sion.

Methods and Results: Baseline two-minute ECG recordings were made in 44 consecu- tive pts (26 male, 18 female, mean age 62±11 years) with atrial fibrillation. The dominant atrial fibrillatory rate was measured (1) by dominant atrial fibrillatory rate (DAFR) and (2) by atrial fibrillatory rate (AFR) of the dominant atrial cycle determined from atrial electrogram (AEG) recordings. TFA was performed and the following parameters were calculated: (1) averaged atrial rate variability (γ), (2) atrial rate variability (Δ), and (3) atrial rate variability (Δ2). Measurements were performed using a respiratory gate.

Results: We found a significant correlation between DAFR and AFR of the dominant atrial cycle (R=0.71, p<0.001) and a significant correlation between atrial rate variability (γ) and atrial rate variability (Δ2) (R=0.61, p<0.001). In 15 patients with persistent AF, we found a significant correlation between atrial rate variability (γ) and atrial rate variability (Δ2) (R=0.70, p<0.001) and a significant correlation between atrial rate variability (Δ2) and atrial rate variability (Δ) (R=0.57, p<0.001).

Conclusions: TFA allows quantification of atrial fibrillation organization, its variability and AF organization. This method has the potential to monitor individual antiarrhythmic drug responses and predict outcome following cardioversion of AF patients.

1148-208 Psychological Stress Increases Heterogeneity of Repolarization in Patients With Structural Heart Disease and Ventricular Arrhythmias

Rachel Lampert, Vladimir Shusterman, Matthew M. Burg, Forrester A. Lee, Christine Earley, Anna Goldberg, Craig A. McPherson, William P. Batsford, Robert Soufer, Yale University School of Medicine, New Haven, CT, University of Pittsburgh, Cardiovascular Institute, Pittsburgh, PA

Background: Psychological stress can precipitate ventricular arrhythmias in patients with CHD as well as sudden death. However, the physiologic pathways for this remain unknown.

Methods: We hypothesized that stress would increase heterogeneity of repolarization, known to be arrhythmogenic.

Methods: 32 pts with ICDs and a history of ventricular arrhythmia underwent ambulatory monitoring during a laboratory mental stress protocol (anger recall and mental stress). OAF, atrial and ventricular repolarization time were measured.

Results: 60% of pts had at least one episode of ventricular fibrillation (VF) during the mental stress protocol. OAF, atrial and ventricular repolarization time were increased during mental stress.

Conclusion: Psychological stress increases heterogeneity of repolarization in patients with structural heart disease and ventricular arrhythmias.