EP4

Baseline ECG Morphology and Outcome in Patients Treated with Cardiac Resynchronization Therapy

Goldenberg, Gustavo; Roman, Nevzorov; Eisen, Alon; Kuzniec, Jairo; Golovchiner, Gregory; Porter, Avital; Strasberg, Boris; Haim, Moti
Rabin Medical Center, Cardiology, Petach Tiqwa, Israel

Background: Cardiac resynchronization therapy (CRT) improves morbidity and mortality in patients with heart failure and QRS >120 ms, yet most patients studied in clinical trials manifest left branch bundle block (LBBB) on their baseline ECG. It is unclear whether benefits of CRT extend to patients with right branch bundle block (RBBB) or interventricular conduction disorder (IVCD).
Objectives: To assess the outcome of patients undergoing CRT therapy based on their pre-procedural ECG morphology.
Methods and Results: This retrospective study included 178 consecutive patients successfully implanted with a CRT device. We compared 3 groups of patients according to their baseline surface electrocardiogram (ECG): LBBB (n= 110, (61.8%), RBBB (n= 18, (10%) and IVCD (n = 47, (26.4%)) The baseline characteristics were similar In the 3 groups. Rate of 1-year recurrent cardiac admissions and 1-year ICD discharge was similar in the 3 groups. However, there was a higher rate of admissions due to heart failure in patients with RBBB as compared to the two other groups (P=0.04). 1-year mortality did not differ between the 3 groups. However, 2 year mortality was higher among patients with RBBB (36.8%) as compared to LBBB (20.9 %) and IVCD (10.6%). Multivariate analysis of baseline ECG parameters associated with two year mortality showed that RBBB (HR-2.9 95%1.25-6.93 CI) on the baseline ECG (p=0.014) and GFR <60(HR 3.7, 95% CI1.60-8.86, P=0.002) were independent predictors of mortality.
Conclusion: Among patients treated with CRT, CRBBB at baseline was associated with increased 2-year mortality risk and heart failure as compared to patients with LBBB and IVCD.

QRS Width in CRT Implantation - Its Association with Re-Admissions and Mortality

Eisen, Alon; Goldenberg, Gustavo; Nevzorov, Roman; Kuzniec, Jairo; Zabarski, Ronit; Porter, Avital; Golovtziner, Gregory; Strasberg, Boris; Haim, Moti
Rabin Medical Center, Electrophysiology and Pacing, Cardiology Department, Petah-Tikva, Israel

Background: Cardiac resynchronization therapy (CRT) is commonly used in patients with heart failure and wide QRS. Whether QRS width before and after CRT implantation have prognostic implications is not clear.
Objectives: To examine the QRS width characteristics of patients before and after CRT implantation and compare their clinical outcomes.
Methods and Results: A retrospective cohort analysis of 157 patients (124 men; age 55-80 years) who underwent CRT implantation during 2004-2008 in our institute. A QRS before implantation of 140ms or less was documented in 82 patients (52%). Clinical characteristics of patients with baseline QRS≤ 140ms were similar to those with baseline QRS>140ms. Patients with baseline QRS ≤140ms were less likely to have LBBB (59.8% vs. 78.7%, p=0.02) and more likely to have an intra-ventricular conduction delay (26.8% vs. 13.3%, p=0.04) as compared to patients with baseline QRS> 140ms, respectively. The QRS difference before and after CRT implantation was 10 ms narrower in patients with QRS ≤140ms as compared to 20ms in patients with QRS>140ms, p=0.001). There was no difference in the rate of re-admissions during 1-year of follow-up (47.6% vs. 46.7% in QRS ≤140ms vs. QRS>140ms, respectively, p=1.0). The 1-year mortality of patients with QRS ≤140ms was higher as compared to patients with QRS>140ms (20.7% vs. 6.7%, respectively, p=0.02) but this difference in mortality was no longer statistically significant in a 2-year follow-up (26.8% vs. 17.3%, p=0.1). On multi-variate analysis, factors associated with 2-year mortality in both groups were chronic renal failure (HR 3.35, 95%CI 1.42-7.88) and pre-procedural RBBB pattern on the baseline ECG (HR 2.9, 95%CI 1.24-6.86).
Conclusions: One year mortality of patients with QRS ≤140ms is higher as compared to 1-year mortality of patients with QRS>140ms and this trend remains after a 2-year follow-up. Baseline RBBB is associated with a poor prognosis regardless of the baseline QRS width.

Pacemaker Implantation after TAVI; Course and Follow-Up

Goldenberg, Gustavo[1]; Nevzorov, Roman[1]; Kusniec, Jairo[2]; Golovchiner, Gregory[2]; Zabarsky, Ronit[2]; Vaknin, Hana[3]; Assali, Abed[3]; Porat, Eyal[4]; Kornowski, Ran[3]; Haim, Moti[2]; Strasberg, Boris[2]

[1]Rabin Medical Center, Cardiology, Petach Tickva, Israel; [2]Rabin Medical Center, Electrophisiology Unit, Petach Tickva, Israel; [3]Rabin Medical Center, Interventional Cardiology Unit, Petach Tickva, Israel; [4]Rabin Medical Center, Department of Cardiothoracic Surgery, Petach Tickva, Israel

Background: 30 to 35 % of patients after Transaortic Valve Implantation (TAVI) need permanent pacing (PP) due to development of or apparent high risk of developing atrioventricular block (AVB). However, their outcome is not clear and it is unknown how many of those patients remain paced on long-term follow-up.

Objective: To assess the proportion of post-TAVI patients with PP who are pacemaker dependent.

Methods and Results: Between month 2009 to July 2011; 106 TAVI implants were performed at Rabin Medical Center (59 Core valve and 47 Edwards Sapiens). 20 patients received PP (18 with Core valve and 2 with Edwards Sapiens valve). PP indications are shown in the table. After an average follow-up time of 50+38 weeks only 4/20 patients (20%) were fully paced. The indication of PP in these 4 patients was complete AVB. Of the 12 patients originally paced for CAVB only 4/12 (33%) are pacemaker dependent. There were no significant differences in demographic and TAVI characteristics between groups.

Parameters	Pacemaker dependent group, n=4(%)	Pacemaker non-dependent group, n=16(%)	p-value
Indications for PM			
CAVB, n (%)	4 (100)	8 (50)	0.1
LBBB and prolonged PR, n (%)	none	7 (43.8)	0.2
>3 seconds Pauses, n (%)	none	1 (6.3)	1
Slow AF, n (%)	none	1 (6.3)	1

Conclusions: In our Center, the rate of PP was 20% which is lower than the reported in the literature. Only 20% of patients who required PP are pacemaker dependent. Further studies are necessary to predict the need of long term pacing.

Clinical Experience with Routine Use of SafeSept™ J-Shaped Guidewire for Transseptal Puncture

Laish-Farkash, Avishag; Katz, Amos; Fishman, Evgeny; Yosefy, Chaim; Cohen, Sharon; Tcherniavsky, Irina; Khalameizer, Vladimir
Barzilai Medical Center, Ashkelon, Israel, Cardiology Department, Electrophysiology Unit, Faculty of Health Sciences, Ben Gurion University, Ashkelon, Israel

Background: Transseptal puncture (TSP) is used for LA access to perform complex mapping and ablation procedures of the left cardiac chambers. Serious complications of up to 6% can arise from TSP, including up to 1.2% pericardial tamponade and 1.3% failure to cross the atrial septum. The SafeSept Transseptal Guidewire is a flexible nitinol J-curve needle that fits through the hub of the transseptal needle and involves the confirmation of left atrial positioning as well as left atrial wall protection. It was proved to be helpful and safe in the presence of thick, aneurysmatic or elastic fossa ovalis.
Aim: To evaluate whether routine use of SafeSept Guidewire improves safety and efficacy of TSP, without the need for intra-procedural echocardiography.
Methods: SafeSept Guidewire was incorporated into the routine TSP maneuver in Barzilai MC since it was introduced to the Israeli market in 2010. Our experience with the safety and efficacy of this guidewire is revised versus historical controls.
Results: 34 patients underwent TSP with SafeSept Guidewire between 2010-2011, predominantly for AF ablation (n=16) but also for left-sided accessory pathways (8), LA tachycardias (5), Watchman device (4) and ventricular tachycardia (1). 15% of the patients had a previous history of TSP. Successful, uncomplicated LA access was achieved in 100% of patients with no complications attributable to the SafeSept Guidewire. There was no difference seen between patients undergoing their first TSP or a repeat one. There was no need for TEE / intracardiac echo-guided TSP when using the SafeSept Guidewire, reducing the overall procedure cost in about 3000$.
Conclusion: Our experience suggests that routine use of SafeSept Guidewire for TSP is safe, efficient and cost effective.

Prospective, Systematic Evaluation of the Psychological Effect of ICD Implantation

Rozen, Guy; Asher, Elad; Granit, Hava; Luria, David; Bar-Lev, David; Gurevitz, Ossi; Gorbatsevich, Elena; Amiaz, Revital; Glikson, Michael
Chaim Sheba Medical Center, Leviev Heart Center, Tel Hashomer, Israel

Background: The effects of implantable cardioverter defibrillators (ICDs) insertion and ICD shocks on emotional well-being have been studied in the past with conflicting results. Most previous studies have been cross-sectional analyses and rarely used validated and standardized instruments to document patients' psychosocial status.
Aim: Systematic evaluation of the ICD implantation effects on the psychological, physical, and mental well-being of cardiac patients using a set of standardized quality of life (QOL) scales.
Methods: Thirty-six consecutive patients without previous psychopathology, who underwent an elective ICD implantation in our Arrhythmia Center since June 2010, were enrolled to the study. Various demographic, clinical and echocardiographic data were prospectively collected. Each patient was psychologically evaluated upon enrolment and 3 months after ICD implantation using the Hamilton Rating Scale for Depression (HAM-D) and Anxiety (HAM-A). Furthermore, patients were asked to describe their subjective feelings towards the ICD.
Results: Out of 36 patients, 26 (72%) were men, average age 64 ± 14 years, average LV ejection fraction (EF) 24% ± 1% with NYHA functional class of 2.17 ± 0.89. The average scores on the baseline HAM-D and HAM-A were 8.13 ± 8.54, and 3.75 ± 4.14, respectively. Three months after ICD implantation we observed a significant improvement in the depression parameters with HAM-D of 5.35 ± 6.51 (paired t test=2.7, p=0.011). The anxiety evaluation showed no significant change at 3 months follow up 3.75 ± 4.59 (t=1.5, p=0.14). The subjective feelings towards the ICD were overall positive, ranked 2.21 ± 0.98 on average. Only 2 patients received shocks during the 3 months follow-up period, not showing any acute psychopathology.
Conclusions: In a small cohort of patients, vast majority with severe cardiomyopathy, ICD implantation was associated with a significant reduction in depressive parameters with no change in anxiety rate.

Surgical Ablation of Lone Atrial Fibrillation

Sternik, Leonid[1]*; Luria, David*[2]*; Glikson, Michael*[2]*; Kogan, Alexander*[1]*; Malachy, Ateret*[1]*; Levin, Shany*[1]*; Raanani, Ehud*[1]

[1]*Sheba Medical Center, Tel-Hashomer, Cardiac Surgery Dept, Ramat Gan, Israel;* [2]*Sheba Medical Center, Tel-Hashomer, Cardiology Dept, Ramat Gan, Israel*

Background: Surgical ablation of atrial fibrillation (AF) is widely used concomitant procedure with mitral and other surgical interventions. The place of AF surgery as a stand-alone procedure remains to be determined.

Methods: Between 2004 and 2011 authors performed surgical ablation of lone AF in 15 patients. Patients were 57±8 years. 5 patients had permanent and 4 persistent atrial fibrillation. 3 patients had left atrial volume >200 cc.

Results: All patients were operated on with cardiopulmonary bypass. 9 patients underwent left atrial ablation and 6 biatrial ablation. 12 patients were operated on with bipolar radiofrequency and cryo ablators and 3 patients underwent cut-and-sew Maze procedure. One patient underwent right minithoracotomy and others midsternotomy. All patients survived. One patient suffered from stroke with complete neurologic recovery and another with right phrenic nerve paralysis. Both complications were related to performed or attempted minithoracotomy. Mean follow up was 29 months (range 1 -72 moths). Sinus rhythm was found at 11 patients of 13 (85%) at 6 month and 1year after the ablation. All patients with sinus rhythm were free from antiarrhythmic medications. Warfarin was discontinued after 6 months in all sinus rhythm patients.

Conclusions: Surgical ablation of lone atrial fibrillation gives excellent freedom from AF, antiarrhythmic medications and Warfarin at mid-term follow up with acceptable operative morbidity.

Telemedicine for Symptomatic Arrhythmia: 'SHL-Telemedicine' Experience in Over 1000 Patients

Golovner, Michal[1]; Tamari, Mira[1]; Hadad, Maor[1]; Zatelman, Avivit[1]; Malov, Nomi[1]; Roth, Arie[2]
[1]SHL, Telemedicine, Tel-Aviv, Israel; [2]Tel-Aviv Sourasky Medical Center, Cardiology, Ichilov Hospital, SHL-Telemedicine, Tel Aviv, Israel

Background: Excessive valuable time is wasted between appearance of cardiac symptoms and diagnosis. The Cardio R® loop recorder uses digital technology to transmit cardiac recordings and symptom descriptions via cellular communication.
Objective: To assess the Cardio R® device's capability for early detection of electrical events which may account for symptoms.
Methods: Recordings are immediately diagnosed by the on-duty medical team at 'SHL'-Telemedicine's call center. Depending upon the displayed rhythm vis-á-vis the described symptoms, subscribers and/or their physicians either receive instructions or a mobile intensive care unit (MICU) is dispatched.
Selected Parameters of the 1086 Study Patients

Variable	Palpitations (735 patients) (18,575 transmissions)	Pre-syncope (301 patients) (7508 transmissions)	Chest pain (50 patients) (1726 transmissions)	Total (1086 patients) (27,809 transmissions)
Age (mean±1 SD), y	56±19	58±21	56±21	56±19
Male gender, %	36	45	44	39
Average transmissions/patient	29±57	28±58	33±55	26±47
Notifications to referring physician, n (%)	56 (0.30)	47 (0.63)	9 (0.52)	112 (0.40)
MICU dispatches, n (%)	16 (0.09)	12 (0.16)	0	28 (0.10)
Advice given to caller (no other action taken), n (%)	207 (1.11)	105 (1.40)	14 (0.81)	326 (1.17)
Relevant complaint* n/total (%)	11,888/18,575 (64)	756/7,508 (10)	949/1,726 (55)	13,593/27,809 (49)
Diagnostic real-time ECG, n (% of relevant complaints*)	11,413/11,888 (96)	446/756 (59)	674/949 (71)	12,533/13,593 (92)
Delay until transmission of 1st symptomatic episode, days	2±5	2±4	2±4	2±5

*The original complaint for which the patient was referred.
Conclusions: The Cardio R® device promptly enabled ECG interpretations to guide interventions for managing cardiac-relevant complaints.

The Clinical Significance of Familial Heart Block in the Perinatal Period

Yahalom, Malka[1]; Roguin, Nathan[2]; Kaiyal Sawaid, Raneen[3]; Turgeman, Yoav[1]
[1]AaHemek Medical Center, Heart Institute, Technion, Haifa, Rappaport School of Medicine, Afula, Israel; [2]Western Galilee Hopital, Cardiology, Technion, Haifa, Rappaport School of Medicine, Nahariya, Israel; [3]Western Galilee Hopital, Obstetrics & Gynecology, Nahariya, Israel

Introduction: Familial abnormalities of heart pulse generation and heart conduction system, both symptomatic and asymptomatic, are sometimes overlooked in daily medical practice. Familial (and congenital) Heart Block (FHB) may be associated with other diseases such as: Hypertrophic and Dilated Cardiomyopathies, Familial Dysautonomia, Emery-Dreifuss dystrophy and Charcot-Marie-tooth disease. Previous reports have documented the dominant (or x-linked) transmission with variable expression of FHB, and its association with collagen disease in the mother. It may appear at any stage of life.
Purpose: To present the clinical and genetic findings, and to emphasize the clinical significance of familial heart block, especially when symptoms exist, even if they are sporadic and minor and are registered during the perinatal period.
Methods used: The members of three families (9 individuals in 3 generations) with symptomatic heart block are evaluated: eight of them required permanent cardiac pacemaker therapy. Last year, a female baby was born to one of our patients. Pre-Natal Fetal Arrhythmia had been noticed and 2nd degree Atrio-Ventricular (AV) block (Mobitz I & II) was observed on 24-hours Holter monitoring.
Conclusions: Careful follow-up is suggested for all family members in whom FHB is present, especially when symptoms exist, and even in the perinatal period.

ECG Predictors for Mortality Risk after CRT Implantation

Nevzorov, Roman[1]; Goldenberg, Gustavo[1]; Eisen, Alon[1]; Porter, Avital[1]; Kusniec, Jairo[2]; Golovchiner, Gregory[2]; Zabarski, Ronit[2]; Strasberg, Boris[2]; Haim, Moti[2]
[1]Beilinson Hospital, Rabin Medical Center, Cardiology, Petach Tikva, Israel; [2]Beilinson Hospital, Rabin Medical Center, Electrophysiology and Pacing Unit, Petach Tikva, Israel

Background: The aim of this study was to analyze the influence of different electrocardiographic (ECG) parameters on mortality after CRT implantation.
Methods: A retrospective cohort analysis of 175 consecutive patients that were implanted CRT between January 2005 and January 2009. We analyzed the influence of different electrocardiographic (ECG) parameters after CRT implantation on two year mortality.
Results: The following ECG parameters were observed in patients after CRT implantation: LBBB configuration (Q in V1) (in 44% of patients), RBBB configuration (R in V1) (46.9%), Q wave in L1 (57.1%), Q wave in AVL (60%), R wave amplitude in L1 higher than in L2 (42.3%), median QRS duration 140 ms (IQR, 25th; 75th percentiles, 120ms; 160ms) and median delta QRS 10 ms (IQR , 25th; 75th percentiles, 0 ms; 20ms). None of these ECG parameters was independently associated with two year mortality after CRT implantation.
Conclusions: In our study we did not find a statistically significant independent ECG predictor for two year mortality

Incidence and Type of Pauses Longer Than 2 Seconds During 24 Hours EKG Recording

Trajkovic, Rada; Kostic, Nikola T.; Tonic, Slavisa; Trajkovic, Biljana
Health Center Gracanica, Cardiology Department, Gracanica, Serbia

Introduction: 24 hour EKG recording (Holter EKG or ambulatory electrocardiography device) is offering great possibility in diagnostic of disorders of the rhythm or conduction. During this recording significantly increase possibility to notice pauses in cardiac rhythm.
Aim: Aim of this study is to show frequency of pauses during 24 hour EKG recording, type of cardiac rhythm and analysis of the impairment of the conduction.
Methods: We follow up all pauses longer than 2 seconds in patients with different cardiology disorders, who were diagnosticated with 24 hour EKG recorder. Study includes time period from 2010-2011, and was enveloped in Cardiology department of the Health Center in Gracanica (Serbia).
Results: Totally we have 395 patients, 147 (37,22%) males and 248 (62,78%) females. Middle age of patients was 59 years. Totally we found 25 patients with pauses (6,33%), 17 males (68%) and 8 females (32%). In male group pause frequency was 11,56%, in female 3,22%. Most of patients have atrial fibrillation. In patients with disorders of the electrical conduction system of the heart, second-degree AV block was dominant. Pauses were most frequent during sleeping time. Longest pause duration was 7,34 seconds. Average number of pauses was 168 per patient, but 12 (48%) patients have less than 10 pauses for 24 hours. Patient with most pauses have 3190 for 24 hours.
Conclusion: Pauses are more often in males. During analysis we can notice that atrial pathological rhythms are most frequent. Disorders of the electrical conduction of the heart are most common, especially second degree AV block.