and the cause of syncope was not clarified. As his brother with similar ICG had died suddenly, he prophylactically treated with an ICD. However, 14 month later he died suddenly after playing a video game. The ICD recorded VF, which was not converted despite 6 cardioversion attempts by the ICD with 30 J. Progression of myocardial damages and/or elevation of defibrillation threshold may have been the cause of unsuccessful cardioversion.

16.6 COST-EFFECTIVENESS OF CRT-ICD IN HEART FAILURE: HOSPITAL COST IN CALABRIA
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Methods: we enrolled 32 patients, QRS interval >130 ms, EF<35%, NYHA class III-IV, with HF refractory to optimal conventional therapy treated with CRT-ICD. 13 patients reached a 12 months follow-up (age 71.8±5, QRS 172±25 ms, NYHA 3.5±0.56, EF 25%±4.2). We conducted an observational study. Data were obtained retrospectively 1 year before implantation and prospectively for the year thereafter: number of hospitalisations, number of hospital days, and cost of care provided. The data obtained during the follow-up period were compared with those during the year before implantation. Hospitalisations were quantified in term of DRG analysis.

Results: statistical reduction of all measured parameters was observed. The number of hospitalisations reduced from 2.2±1.1 to 0 (p=0.007), the hospital days from 14.5±6.5 to 0 (p=0.008), NYHA class from 3.6±0.45 to 2.50±0.48, (p=0.001) and EF from 26.66% to 36.2±8.26% (p=0.001). As a result, the hospitalisations reduction yields a mean decrease of the cost per patient year of 6,176 €, despite the initial device cost of 13,944 €.

Conclusion: CRT-ICD results in hospital cost reduction in HF patient managing, and improves patient quality of life and health status. The most interesting result of the study is a considerable reduction in the number of hospitalisations.

16.7 ARE THERE ANY PREDICTORS FOR SUCCESSFUL TRANSGENIC VENTRICULAR DEFIBRILLATION IN ICD RECIPIENTS?

The implantation of an ICD is the treatment of choice for patients (pts) with ventricular tachyarrhythmias (VF). To ensure correct functioning, VF is induced and ICD shocks are delivered at least twice intraoperatively.

To determine the outcome and predictors of successful transgenin ventricular defibrillation, we retrospectively analysed pts and device characteristics, medication, and procedure related data of 240 ICD implantations from 201 pts (61 +/-16 yrs, 77% men).

The 1st ICD shock successfully terminated VF in 191/240 (80%) cases, the 2nd shock in 182/191 (95%). There was no difference in pt and device characteristics in relation to outcome. The cycle length of induced VF: (1st shock: 217±39vs.200±27ms; 2nd shock: 204±41vs.188±29ms) and the time between 1st and 2nd shock (424±400vs.302±141s) tended to be shorter when defibrillation was unsuccessful. Fast ICD shock delivery (14.1±16.0ms) and VF induction by t wave shock (92±18vs.78%) were significantly associated with successful defibrillation.

Transgenic ventricular defibrillation is highly successful intraoperatively. Possible predictors for success are induced VF cycle length, VF induction by t wave shock, duration of VF and time between 1st and 2nd shock delivery.

16.8 EVALUATION OF P WAVE SIGNAL AMPLIFICATION IN A SINGLE-LEAD ICD
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The atrial channel of a VDD-ICD system is provided with an additional filtering/amplification stage to improve sensing performance. We compared P wave amplitude measured at implant with a conventional PSA (unfiltered P wave) with the measure provided telemetrically by the ICD (filtered P wave). Filtered/unfiltered P wave ratio (amplifier factor) was evaluated at implant and during follow-up in 21 patients.

At implant the mean filtered P wave amplitude was significantly higher than the mean unfiltered signals (3.91 ± 0.65 mV vs 1.96 ± 1.64 mV, p<0.01). The mean P wave amplifier factor was 2.9 ± 1.8 (range 0.68-7.98). Unfiltered P waves < 1 mV was prophylactically to amplifier factors significantly higher than those associated with P wave > 1 mV (4.46 ± 1.91 vs 1.93 ± 0.68, p<0.001).

At follow-up (176 ± 119 days), the mean P wave value was 3.76 ± 0.91 mV with no difference with value at implant (p=0.90). Undersensing was never observed also during atrial fibrillation (4 patients).

The evaluated VDD-ICD system reliably amplifies P wave amplitudes maintaining this performance during the observed follow-up.

17. ATRIAL FIBRILLATION: PATHOPHYSIOLOGY AND EPIDEMIOLOGY

17.1 CHRONIC LEFT ATRIAL OVERLOAD IN THE GOAT: ELECTROPHYSIOLOGICAL STUDY
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In the research for dilatation induced atrial fibrillation (AF), electrophysiological and hemodynamic investigation of the left atrium (LA) was effectuated in a new animal model of chronic LA overload.

In 12 goats, a thoracotomy was performed to implant a vascular graft between the aorta and LA. In a control group, the graft was ligated. Overload was quantified after chronic instrumentation of the LA with ultrasonic crystals, bipolar sensing/pacing electrodes and a LA pressure catheter. Electrophysiological evolution was regularly evaluated in the conscious goats. “Continuing” AF was the ultimate purpose.

After 26.6±13.9days of overload, LA length increased significantly by 43.4±18.0% and LA pressure mounted from 8.6±6.3 to 27±10.4mmHg (p=0.05). Three animals presented prolonged AF, 3 sustained AF (>1hour), and 6 “continuing” AF (ongoing after 1week). Compared with the control group, LA overload enhanced significantly the effective refractory period, but did not result in a significant modification in conduction time or initial cycle length.

Chronic LA pressure/volume overload can induce “continuing” AF in a span of weeks. The increased vulnerability to AF cannot be explained by electrophysiological alterations of the LA.

17.2 ANATOMICAL AND ELECTRICAL REMODELLING IN PAROXYSMAL VS. PERSISTENT ATRIAL FIBRILLATION
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Aim: to assess the relation between decremental interatrial conduction properties and atrial dilatation in patients (pts) with paroxysmal (p) vs persistent (P) atrial fibrillation (AF).

Methods: pts without structural heart disease and sustained AF episodes <1 month were included. Parameters: left atrial dimensions, surface (LAs), volume (LAv ellipse formula), right atrial surface (RAs), total atrial surface (TaS=LAs+RAs). To examine atrial electrophysiological properties it was calculated maximum percentage prolongation of interatrial conduction time (iaCT) during premature stimulation of high right atrium using S2 and S3 delivery: decremental index (Di)=iaCT S3-iaCT S1/iaCT S1%.

Results: 27 pAFpts (53±9 years) were compared to 21 PAFpts (55±13 years). Following parameters were significantly higher in PAFpts: Di: 79±25% vs 51±19%, p<0.0001; LAv: 5.5±0.3 vs 5.2±0.3cm, p = 0.01; LAs: 23.5±1.3 vs 19.5±2.4cm, p<0.001; LAv ellipt form, ratio, right atrial surface (RAs), total atrial surface (TaS=LAs+RAs). To examine atrial electrophysiological properties it was calculated maximum percentage prolongation of interatrial conduction time (iaCT) during premature stimulation of high right atrium using S2 and S3 delivery: decremental index (Di)=iaCT S3-iaCT S1/iaCT S1%.

Conclusion: This study demonstrates increased atrial stretch in PApts compared to pAFpts and that electrical remodelling is associated with anatomic remodelling.

17.3 ATRIAL STRETCH IN PATIENTS WITH PAROXYSMAL FUNCTIONAL TACHYCARDIAS AND ATRIAL FIBRILLATION BUT STRUCTURALLY NORMAL HEART
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AIM: to assess the relation between decremental interatrial conduction properties and atrial dilatation in patients (pts) with paroxysmal (p) vs persistent (P) atrial fibrillation (AF).

Methods: pts without structural heart disease and sustained AF episodes <1 month were included. Parameters: left atrial dimensions, surface (LAs), volume (LAv ellipse formula), right atrial surface (RAs), total atrial surface (TaS=LAs+RAs). To examine atrial electrophysiological properties it was calculated maximum percentage prolongation of interatrial conduction time (iaCT) during premature stimulation of high right atrium using S2 and S3 delivery: decremental index (Di)=iaCT S3-iaCT S1/iaCT S1%.

Results: 27 pAFpts (53±9 years) were compared to 21 PAFpts (55±13 years). Following parameters were significantly higher in PAFpts: Di: 79±25% vs 51±19%, p<0.0001; LAv: 5.5±0.3 vs 5.2±0.3cm, p = 0.01; LAs: 23.5±1.3 vs 19.5±2.4cm, p<0.001; LAv ellipt form, ratio, right atrial surface (RAs), total atrial surface (TaS=LAs+RAs). To examine atrial electrophysiological properties it was calculated maximum percentage prolongation of interatrial conduction time (iaCT) during premature stimulation of high right atrium using S2 and S3 delivery: decremental index (Di)=iaCT S3-iaCT S1/iaCT S1%.

Conclusion: This study demonstrates increased atrial stretch in PApts compared to pAFpts and that electrical remodelling is associated with anatomic remodelling.
Aim: to comparatively assess echographic indicators of atrial dilatation and decremental and interstitial and conduction in patients (pts) presenting junctional reentrant tachycardias (JT) with or without paroxysmal atrial fibrillation (pAF).

Methods: 58 pts without structural heart disease, referred to electrophysiological study which underwent ablation for JT were studied; 26 pts aged 41±10 years with pAF episodes/ inducible AF, were compared to 32 control-matched JT pts aged 39±12 years. Parameters: left atrial dimensions (LAd=M-mode, parasternal), LAt and LAI are measurements of short and long-axis apical four chamber view (LAs, volume (LAv using ellipse formula), right atrial surface (RAs), total atrial surface (TAs=LAv+RAs). Baseline index (DI) was calculated as maximum percent prolongation of intercatricular conduction time (iaCT) during S2 and S3 delivery.

Results: there was no difference between the 2 groups concerning baseline iaCT (59.21 ms vs 53.18 ms ± 8.08 nm, p>0.05), LAd and LAt (p=0.09) while the following parameters were significantly higher in pAF pts: LAI: 5.0±0.5 vs 4.5±0.5 cm (p=0.01), LAv: 19.6±5.7 vs 16.3±3.2 cm2, (p=0.001); TAs: 35.6±6.9 vs 27.6±5.1 cm2 (p=0.0011); LAd: 46.6±10.4 vs 37.2±9.5 ml, (p= 0.0001); DI: 41.1±7% vs 24±14% (p= 0.001). In pAF group, atrial fragmentation and atrial double potentials were recorded in 23 pts. No control pts had this evidence.

Conclusions: this study supports the role of atrial stretch in the genesis of AF in pts with junctional tachycardias. Further studies need to investigate the relation between burden of tachycardia and atrial stretch in a larger population.

17.4 PROLONGED SIGNAL- AVERAGED P-WAVE DURATION AND THE LONG-TERM RISK OF PERMANENT ATRIAL FIBRILLATION

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Objective: To assess the long term risk of development of permanent atrial fibrillation (AF) in relation to the signal-averaged P wave duration (SAPWD), clinical and echocardiographic characteristics.

Methods: We studied 131 consecutive patients (88 M; median age 67 (29-87) years) with an earlier successful cardioversion of long-lasting AF to sinus rhythm (SR) at a long-term control visit. Electrocardiographic, clinical, and echocardiographic parameters had all been assessed at the primary cardioversion. The patients were classified as having persistent or permanent AF; permanent AF defined as accepted arrhythmia. Four patients could not be classified due to death or unclear treatment strategy; their data were censored. At the follow-up time, 67 patients had developed permanent AF. The predictive value of age, gender, hypertension, duration of the AF episode before cardioversion longer than one year, total duration of AF disease longer than two years, a left atrium diameter above 50 mm on the echocardiogram, the duration of the follow-up period, and the SAPWD on the probability of development of permanent AF was assessed by use of a logistic regression model.

Results: The median duration of the follow-up period was 2.68 (0.22-4.61) years. Only prolonged SAPWD (odds ratio (OR) 1.32 with a 95% confidence interval (CI) 1.08-1.61, p=0.0067) and the duration of the follow-up period (OR 1.72 with a 95% CI 1.09-2.71, p=0.020) were significantly associated with an increased risk of established permanent AF.

Conclusions: Prolonged SAPWD is a risk factor for development of permanent AF. Patients with this indication of advanced electrophysiological remodelling should be monitored closely and in case of recurrent AF rate control strategy should be considered early in the course.

17.5 BNP LEVELS PREDICT ATRIAL FIBRILLATION AFTER CARDIAC SURGERY

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Background: Post-operative atrial fibrillation (AF) remains a frequent event after cardiac surgery. The present study is aimed to evaluate the potential association between plasma BNP levels and AF after cardiac surgery.

Methods: BNP levels were determined at the beginning of the rehabilitation program, 1025 days after cardiac surgery in 89 pts in sinus rhythm at admission.

Results: In 32 pts (36%) at least one episode of AF occurred in the cardiac surgery department. A trend towards higher BNP levels in these pts in comparison to those without arrhythmia was observed (p=0.07). BNP levels upper the 5th percentile were related to higher risk of AF (p=0.01). Among these 32 pts, 12 (37%) developed a recurrence of the arrhythmia during the rehabilitation period, in comparison to 57 pts (7%) without arrhythmia. Multivariate analysis, only age and plasma BNP levels had independent association with post-operative AF (p=0.01 and p=0.04 respectively).

Conclusions: These preliminary data show an association between plasma BNP levels and AF after cardiac surgery, suggesting a more aggressive approach during rehabilitation in older patients with elevated BNP levels.

17.6 EPIDEMIOLOGY AND COSTS OF ATRIAL TACHYARRHYTHMIAS

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Background: There are no Italian data on the epidemiology and hospital costs of Atrial Tachyarrhythmias (AT).

Methods: Prospective systematic evaluation of all Emergency Room admitted patients with a diagnosis of AT in the Alessandria, Novara, Tortona and Novi-Ligure Hospitals from 11th November 2004 to 31st January 2005.

Results: A total of 212 patients were enrolled (average age: 66.21 ± 15.4; 48.8 % was male. Most of the patients were admitted to the ER in the first 48 hours after the AF event (158/206, 76.7%). A total of 1029 diagnostic test and therapeutic procedures were performed (an average of 4.8 per patient). Out of the total patients, 156 were discharged from the ER, 31 were hospitalized in the short-term observation department (average length of stay: 1.28 days), 9 were hospitalized in the cardiology department (average length of stay: 6.6 days), 13 were hospitalized in other departments (average length of stay: 2.5 days) and only two patients had different destinations.

Conclusions: This study shows that AT, even if most patients are discharged directly from ER, absorb a relevant amount of hospital resources.

17.7 THE USE OF HOLTER MONITORING IN EPIDEMIOLOGICAL STUDIES

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Aim: To work out a set of biological parameters, including Holter data (HM) for prediction of individual health among the elderly. The sample of 201 individuals (aged 67-87) was randomly selected from the Moscow Lipid Research Clinics cohort. Protocol included a questionnaire, physical performance tests, and medical examination. Relationships between the health outcomes and biomarkers were estimated. Significant associations were found: Self-Rated Health - with smoking status, BMI, grip strength, cortisol, Physical Activity Score - with smoking status, grip strength, low difference between the day and night heart rate averages, Disease Score - with HDL, pain of possible myocardial infarction (Rose questionnaire), circadian presence of arrhythmia and low awake increase in heart rate (HM); Mortality Score - with smoking status, grip strength, MEAN >1000 ms, episodes of supraventricular tachycardia (HM). Heart rate parameters measured by HM are associated more closely with majority of health outcomes compared to other biomarkers and scores.

18. ATRIAL FIBRILLATION: ELECTRICAL CARDIOVERSION AND DRUG PROPHYLAXIS

18.1 THE EFFECT OF PHARMACOTHERAPY ON THE RESULTS OF EXTERNAL CARDIOVERSION

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Several studies had verified the data about the influence of angiotensin system on atrial fibrillation, its relation with atrial fibrillation (AF) and frequency of early relapses after external cardioversion (ECV). Our aim was to analyse the effect of possible pharmacotherapy patterns on AF relapses after ECV.