atrial signal, two variants of electrodes with different tip-to-dipole distance (15 mm and 17 mm), active fixation, and thinner electrode profile. Purpose: Study aim is to present the long-term performance of the Linx S DX lead focusing on the atrial signal quality and the rate of shock. Methods: The lead and internal ECGS data of 93 patients were prospectively collected through tele-monitoring and retrospectively analysed. Results: A total of 93 patients (81.5% male, 18.5% female; 58.9±12.5 years) were implanted with the Linx S DX lead. ICD implantation as primary prophylaxis was performed in 66.7% of the patients. Patients were followed up for a median of 693 days (33-2460 days). At time of ICD implantation average P-wave value was 3.5±1.7 mV and remained stable throughout follow-up with an average value of 3.7±1.1 mV (p=0.2). Ventricular amplitude was significantly reduced (initially 13.5±4.7 mV; follow-up value of 12.6±4.9 mV; p<0.01), and ventricular impedance value was stable (545.6±91.7 Ohm vs. 549.0±289.7 Ohm; p=0.9). Ventricular threshold was significantly increased (0.6±0.3 V/0.4ms vs. 0.7±0.4 V/0.4ms; p=0.001). In 60 patients episodes were detected of whom 26 (43.3%) were incorrectly stratified by the device. Nine patients experienced adequate ICD therapy (9.6%) and eight patients (8.8%) inadequate ICD therapy. All patients with inadequate ICD therapy had been implanted with leads having a tip to dipole distance of 17 mm (p=0.03). In three patients VT episodes were not detected and remained untreated. Conclusion: To our knowledge this is the largest cohort of patients implanted with the Linx S DX lead presenting the longest follow up. As emerging from our results, there is a satisfactory long-term stability of the atrial sensing. Inadequate therapy occurs with a rate similar to that experienced with dual chamber ICDs and seems related to the design of the lead. Moreover, almost 50% of the messages sent to the device during follow-up are incorrect. As a result, malignant arrhythmias may remain undiagnosed and untreated while occurring. In fact, in spite of a stable atrial signal performance, there are other problems emerging in the atrial channel far-field sensing. More specifically, we have documented that VT episodes may be misclassified as SVT if, at time of VT onset, the device does not recognize a valid right atrial signal and switches from a two chamber algorithm to a single chamber algorithm, as programmed by the manufacturing company. Results: In larger prospective cohorts should be analysed and software improvements of the device should be suggested to overcome these potential drawbacks.

Abstract P423 Figure. Linx S DX lead.

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Use of short leads for the implantation of dual-chamber pacemakers
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In dual-chamber pace maker (PM) implant 58-60 cm leads are conventionally used for ventricular pacing and 52-53 cm leads for atrial pacing. However the use of shorter leads – commercially available – could limit the bulk in the PM pocket, thus preventing mechanical complications and possibly infections.

A simple protocol allows to test if shorter leads may be implanted, without discarding any: first implant of a straight, active fixation, 52-53 cm lead is attempted in the right ventricle (RV) – if successful a 45-46cm lead is implanted in the right atrium (RA) – if unsuccessful the 52-53 cm lead is implanted in RA, then a 58-60 cm lead is implanted in RV.

Aim of the study is to evaluate the feasibility and efficacy of the above described protocol, and to identify parameters - such as height or body surface area (BSA) - predictors of failure of short leads implant.

From February 2015 to December 2016 in all consecutive patients (pts) who received a dual-chamber PM by a single experienced operator, the use of "short" PM leads was attempted: 47 pts were implanted (29 men, 18 women), median age 81 years (range 36-89), median height 166 cm (range 150-185), median BSA 1.8 m2 (range 1.3-2.3). In Table access veins and implant site are listed. In 45 pts (95%) the implant of "short" leads was feasible. In 2 pts "conventional" length leads had to be implanted. Data of these 2 pts are listed in Table. Of note subject 35 had a peculiar venous anatomy with kinking of the left subclavian vein; both pts had higher-than-median BSA. All procedures were successful and free of adverse events. No lead was discarded. At current follow-up no adverse events are known.

In conclusion, the use of shorter PM leads is feasible and safe in a vast majority of pts receiving a dual-chamber PM; it does not implicate any lead discard. Due to a very low rate of unsuccessful it is not currently possible to identify parameters predictors of success/failure of implant of short leads.

Access vein Ventricle Atrium Ventricular site Atrial site
Cephalic 26 18 45 18
Axillary 18 25 45 18
Subclavian 3 4 45 2

Unsuccessful implants:
Subject # Age (yrs) Sex Height (cm) BSA (m2)
35 81 male 170 1.85
47 83 male 175 1.95

Abstract P424 Figure. Multivariate analysis of risk factors of
Safety of use in electrocoagulation in general surgical procedures in patients with an implanted pacemaker

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Patients with implanted pacemakers are 1-2% among patients admitted for emergency and planned surgeries on abdominal and chest organs, peripheral vessels, musculoskeletal system. The presence of the pacemaker in the patient confronts the surgeon and anesthesiologist a number of issues related to the risk of serious violations of the pacemaker, up to the complete failure of the pacemaker during the surgery. The aim of this study is to write the algorithm for the safe use of electrocoagulation during general surgical procedures in patients with an implanted pacemaker.

Methods: the study included two phases. Phase I: a retrospective analysis of surgical treatment of 986 patients whom permanent pacemakers were implanted in Central Clinical Hospital. The analysis of the data showed that among them 123 patients had a variety of surgeries after pacemaker implantation. Period before pacemaker implantation after general surgical procedures was from 7 days to 12 years. There were 75 (61%) men and 48 (39%) women. The age of patients ranged from 27 to 80 years (mean age 68.3 ± 1.7 years). At this phase we created recommendation of the surgical use ofotrational temporary pacing electrode. Recommendation includes: a comprehensive survey of the pacemaker system, the increase in the stimulating pulse amplitude, reprogramming pacemaker in bipolar mode and use of electrocoagulation in bipolar mode. In and main phase of the study included 92 patients with previously implanted pacemakers who had the planned procedures at the Department of Hospital Surgery with the course of Pediatric Surgery. Sex distribution among the patients: 60 men and 32 women (65.2 and 34.8%, respectively). The mean age was 67.2 ± 2.3 years. All procedures were performed with the mandatory application developed recommendations. There were no pacemaker errors during surgery and in the postoperative period.

Conclusion: Permanent pacemakers in patients are not a contraindication for surgical procedures in the presence of an implanted pacemaker. The presence of the pacemaker confronts the surgeon between true and false electrocoagulation. Using modern pacemaker models while meeting the safety measures and the use of bipolar electrocoagulation allows doctors to perform surgeries of any complexity using electrocoagulation without the risk of pacemaker errors.

Use of screwed electrode for temporary pacing in CoreValve TAVI patients

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Background: During self-expandable valve (CoreValve) TAVI procedure a temporary pacemaker (PMK) is implanted for optional use during the procedure, and to treat temporary conduction abnormalities which might be caused within the first few days after the procedure. A few, but significant, complications has reported regarding the use of trational temporary pacing electrode.

Objective: To evaluate whether the use of flexible screwed electrode, instead of the usual temporary electrode, is safe and effective.

Methods: Since March 2015 we included all patients who referred to our tertiary center for TAVI procedure using CoreValve. We implanted flexible screwed electrode via right jugular vein which was connected to a permanent PM battery which was placed external to the patient. We prospectively collected clinical data during the procedure and during the hospitalization period.

Results: We enrolled 17 patients during the study period. The basic rhythm was sinus in about 80% of the patient, and almost 60% of them had basic conduction abnormality (AV block or Branch Block) prior to the TAVI. The pacing threshold was below 1mA within 95% of the patients, with no side effect except of one patient with small local hematoma. Period of TAVI procedure was a delay regarding the pacemaker insertion. All the patients were out of bed in the morning post the TAVI date, while slightly more the one third of the patients have needed pacing by the temporary PM. A permanent PM was implanted in 30% of the patients within 2 to 5 days post TAVI.

Conclusion: An implantation of temporary PMK using a flexible screwed electrode in the TAVI CoreValve patients is effective, does not affect the length of the procedure, more convenient to the patients, while it has no significant complication. A further randomized trial is recommended.

Usefulness of SPECT-CT with radioisotope-labeled leukocytes for diagnosis of lead-dependent infective endocarditis

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Introduction: Lead-dependent infective endocarditis (LDIE) is a life-threatening complication of permanent transvenous pacing. According to the 2015 ESC guidelines the diagnosis of LDIE is based on the modified Duke criteria (MDC), whereas SPECT-CT with radioisotope-labeled leukocytes serves as additive tool in difficult cases. The major challenge is to differentiate intracardiac mass (ICM) on the lead between true vegetation versus thrombus.

Methods: The prospective registry included 23 consecutive patients admitted with ICM on the lead and suspicion of LDIE. The confirmation or rejection of LDIE diagnosis was made according to the algorithm based on MDC. All patients underwent SPECT-CT with radioisotope-labeled leukocytes. A telephone questionnaire was conducted at the end of follow-up to verify the correctness of the diagnosis ("LDIE in follow-up") in patients who did not undergo transvenous lead extraction (TLE) procedure.

Results: LDIE-positive* group consisted of 12 patients (LDIE definite – 8; LDIE possible - 4). LDIE diagnosis was rejected in 11 patients. SPECT-CT results were compared with MDC and showed an optimal diagnostic value: sensitivity (75%), specificity (72.7%), accuracy (73.9%), positive and negative predictive values (PPV 75.0% and NPV 72.7%), likelihood ratio positive and negative (LR+ 4.500, LR– 0.05), systemic infection (24 vs 3%, p = 0.011), decreased haemoglobin level (109 vs 108 g/L, p = 0.001), increased creatinine (162 vs 108 µmol/L, p < 0.001). Complete extraction was achieved in 95.5% of leads, with 2.2% with ≥4 cm of lead remaining in situ. Predictors of procedural failure include age but not type or number of leads (11.1±6.6 vs 8.3±11.3 years, p = 0.05), systemic infection (24 vs 3%, p = 0.001) and increased creatinine (162<24 vs 108<16 µmol/L, p = 0.012). Laser extraction resulted in 100% success in removing leads. Gender, procedure duration, fluoroscopy time and dose, use of general anaesthesia or temporary pacing was independent of extraction technique and outcome.

Discussion: This is the first UK prospective multi-centre study of lead extraction data comparing extraction techniques. Overall there is a low major complication and high success rate with the use of either simple traction or specialist equipment. From our findings, high risk cases can be identified pre-procedure to allow adequate case planning.

The effectiveness of transvenous leads extractions implanted more than 10 years before: a single center experience

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Introduction: The increasing number of patients with cardiac implantable electronic devices (CIEDs) causes a rise of transvenous leads extractions (TLE) procedures more often concern the electrodes of the long-term functioning. Retrospective analysis of the effectiveness and safety of TLE performed on leads implanted at least 10 years before the extraction.

Methods: used Between 2005 and 2016 we performed TLE of 1207 electrodes in 843 patients. Out of these, 386 (%) leads in 281 (%) patients had been implanted for at