

**P2428 Pace maker infections: risk factors in a case-control study from a cohort of 2496 patients**

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**Introduction:** Stimulation devices implantations, such as pacemakers (PM), have been steadily growing in the last few years but related infections increased even more. The objective of our study was to identify patient's and peri-procedural risk factors for early and late PM infection.

**Methods:** Our cohort included patients requiring a PM implantation between october 1996 and july 2007. Cases were defined as PM or lead infection during follow-up and 2 controls were matched for each case according to sex, age and date of implantation. Data regarding patient's conditions and heart disease, previous or concomitant invasive procedures, type of stimulating devices and post procedural complications were prospectively recorded during this period and were available for analysis.

**Results:** In our cohort 2496 primary implantations and 372 replacements were performed. We found 35 PM related infections (infection rate 1.4% per patient, 1.2% per PM implantation) during a mean follow up of 918 days. The median delay between PM implantation and infection was 86 days. A germ was identified on culture's device in 40% of the cases, 50% were staphylococcus aureus. PM leads were removed percutaneously in 97% of the patients, one patient required surgical removal. Diabetes mellitus ( $p=0.002$ ), heart disease (low ejection fraction, valvular disease, previous heart surgery) ( $p=0.047$ ), additional procedures related to PM implantation (temporary pacing, electrophysiological test, high frequency ablation) ( $p=0.05$ ), dual-chamber pacing ( $p=0.016$ ) and early complications (hematoma, leads displacement), which occurred in none of the controls, were related with PM infection in univariate analysis. Among these, diabetes mellitus ( $p=0.045$ ; OR=3.65), history of heart disease ( $P=0.028$ ; OR=3.12) and dual-chamber pacing ( $p=0.021$ ; OR=4.07), were independently associated with PM infection.

**Conclusion:** in our study device infection rate was low and were related to patient's condition (diabetes mellitus and heart disease) and periprocedural conditions (local complication and dual chamber pacing).

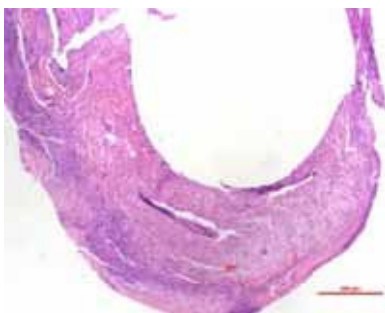
**P2429 Differences in encapsulating leads tissue in patients who underwent transvenous leads removal**

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**Introduction:** Endocardial leads are encapsulated by fibrocollagenous tissue. Features of vasculogenesis, focal infiltrates of lymphocytes, plasma cells, histiocytes as well as foci of calcification can be present, sometimes hemosiderin in macrophages and extracellularly in the connective tissue can be observed. The aim: of our study was to characterize specific tissue reaction of encapsulating lead tissue in patients who underwent transvenous lead removal.

**Material and methods:** 56 leads (27 atrial, 24 ventricular, 5 ICD) were removed from 31 patients (pts) (mean age 70 years). Indications for removal were chronic pocket infection (CPI) (9), infective endocarditis (IE) (6), non functional leads (NF) (16 pts). Leads with their surrounding tissues were immediately fixed in paraformaldehyde. Tissues were embedded in paraffin wax, stained with hematoxylin-eosin and examined histologically. The outermost insulation leads abrasion were examined in stereomicroscope.

**Results:** Mean lead age encapsulated by connective tissue sheath was 89 whereas encapsulate by granulation tissue was 47,34 months ( $p=0.03$ ). Calcification was present in 12 (%) patients. Presence of hemosiderin was observed only in intravenous lead abrasion with perforation (29%;  $p=0.007$ ) and correlated significantly with c-reactive protein levels ( $p=0.001$ ) and white blood cells ( $p=0.008$ ). Vasculogenesis was present in 1 (6%) with NF, 5 (56%) with CPI and 3 (50%) with IE ( $p=0.02$ ).



**Conclusions:** Granulation in encapsulating tissue were observed in pts with younger leads. The presence of hemosiderin correlated with elevated inflammation markers. Vasculogenesis was observed more often IE and CPI what might indicate indirectly thickness of the sheath.

**P2430 The outermost silicon and polyurethane insulation lead failure**

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Polyether polyurethane (PEU) elastomers undergo biodegradation in the mechanism of environmental stress cracking (ESC) that concerns the outermost insulation that was in direct contact with tissue, associated with macrophage and foreign body giant cell adhesion to the device and the release of lysosomal oxidants. The abrasions of the outermost silicon lead insulation might appear in the intracardiac region, intravenous (crush syndrome) and in the pocket part of the leads (due to friction between leads or lead and pulse generator). The aim of our study was to determine the frequency of the outermost insulation lead damage.

**Materials and methods:** 301 leads (146 atrial, 113 ventricular, 31 ICD) were removed from 182 patients (pts), mean pt age was 63,7 years old (range 8-89). Reasons for removal were chronic pocket infection (CPI) (38 pts), infective endocarditis (IE) (32 pts), non functional leads (112 pts). The mean time from lead implantation to removal was 81,9 months. The outermost insulation was silicon in 281 leads and polyurethane in 20 leads (ICD). The outermost leads insulations were analyzed in stereomicroscope and scanning electron microscope.

**Results:** The outermost PEU ICD leads insulation were damaged in the intracardiac part in 18/20 (90%), intravenous 6/20 (30%), in the pocket region 3/20 (15%) most likely in the mechanism of ESC. There were only 6/20 (30%) leads removed due to indications associated with inflammation process (CPI or IE). There were 84 silicone outermost lead insulation abrasions with perforation. Insulation damages of atrial leads: in the intracardiac part 25 (17.1%), intravenously 3 (2.1%), in the pocket 4 (2.7%) and ventricular leads in intracardiac 39 (34.5%), intravenous 5 (4.4%) and in the pocket region 7 (6.2%) and there was in ICD lead one case of abrasion in the intracardiac part.

**Conclusions:** In case of PEU insulated leads damages were observed most frequently in the intracardiac part of the leads and were present mainly in patients who underwent lead removal due to non functional lead. Abrasions of the outermost silicon insulation were noticed most frequently in the intracardiac part of the lead and more often concerned ventricular leads.

**P2431 Pacing in familial amyloid polyneuropathy**

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**Introduction:** Familial Amyloid Polyneuropathy (FAP) is an autosomal dominant hereditary disease, which affects the peripheral nervous system in its three components (motor, sensitive and autonomic). The involvement of the autonomic nervous system as well as myocardial infiltration can result in various manifestations of cardiovascular disease. The most common of those manifestations are changes in atrio-ventricular conduction and sinus node disease. This explains why many of the patients (P) with FAP need permanent pacemaker (PM). In the subgroup of P awaiting liver transplantation, the indications for PM implantation are broader than those used for the general.

**Objective:** To characterize a population with FAP, assess the main indications for PM implantation and describe the evolution of these P.

**Population and Methods:** Review of all clinical processes of P with FAP who underwent implantation of PM in our hospital.

**Results:** We evaluated 26 P, 15 females (57.7%), with a mean age of  $49.5 \pm 10.6$  years. Two P were first-degree relatives and 4 were second-degree relatives. The mean age of implantation of PM was  $45.5 \pm 10.9$  years. The main indications for implantation were: atrio-ventricular complete blockade (11P), patients on the waiting list for liver transplantation (4P) and sinus node disease (4P). The modes of PM implanted were DDDR (7P), DDD (5P), VDDR (3P), VVI (7P) and VVIR (4P). The median follow-up was 51.0 months (interquartile range P25: 22.8 months and P75: 89.5 months). The average number of visits was  $9.6 \pm 6.8$ , and they had an average of  $2.9 \pm 2.9$  visits per year. In 6 P (23%) there was a need for changing the pacemaker mode because of development of atrial fibrillation (4P), atrial flutter (1P) and brady-tachycardia syndrome (1P). The mortality rate was 38.5%. It happened in average  $18.0 \pm 35.0$  months after implantation of PM. None of the transplanted patients died so far.

**Conclusion:** This study shows that this population develops cardiac bradyarrhythmias with indication for PM at a younger age than the general population, implying a close and early screening of these P. Furthermore, in 23% of P there was the need of changing pacemaker mode because of new changes in heart rhythm. This shows the progressive nature of the arrhythmias in this population and points to the need for periodic monitoring of these P. According to this study, liver transplanted patients seem to have an overall better outcome.

**P2432 RV threshold behavior: the role of algorithms for automatic verification of stimulation**

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**Purpose:** Long term (>1 year) behaviour of RV pacing threshold has never been