PACING AND CARDIAC ELECTROPHYSIOLOGY

GW26-e4436

Reduction of esophageal injury by contrast visualization of the esophagus during radiofrequency ablation for atrial fibrillation

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OBJECTIVES Ablation along the posterior wall of left atrium can result in atrioesophageal fistula due to thermal injury to the esophagus. The purpose of our study was to investigate whether contrast visualization of the esophagus reduces collateral injury during atrial fibrillation (AF) ablation.

METHODS 78 patients with paroxysmal AF underwent circumferential pulmonary vein isolation (PVI) guided by ingested contrast medium of esophagus with follow-up endoscopy within 24 hours. Cine imaging of the esophagus was performed at the beginning of ablation, after adjacentipsilateral PVI, and at the end of the procedure. Positions were measured by fluoroscopic images. The ablation lesion set was modified to minimize overlap with the esophagus in the contrast-guided group and a single final ingestion was performed at the end of the procedure for the control group. Esophageal damage was assessed by esophageoscopy within 24 hours.

RESULTS The incidence of esophageal damage was 20.5% (8/39) in control group and was 5.1% (2/39) in visualization group ($p < 0.05$). The ablation lesion set crossed over the esophagus in 46.2% of patients in the control group whereas the ablation line could not be altered away from the esophagus in 15.4% of patients in visualization group ($p < 0.01$). Only 1.9% (1/54) patients in non-crossed group had esophagus damage, but 37.5% (9/24) patients in crossed group had lesions ($p < 0.01$).

CONCLUSIONS Esophageal contrast-guided PVI can reduce esophageal damage in patients referred for AF ablation.

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Active-fixation Atrial Pacing Leads Following Amputation of Right Atrial Appendage: Long-term, Single-centre Study

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OBJECTIVES To investigate the long-term feasibility and stability of active-fixation pacing leads following amputation of right atrial appendage (RAA).

METHODS Active-fixation leads were used in 85 consecutive sick sinus syndrome or high-grade atrioventricular block patients with (Group 1, n=22) or without (Group 2, n=63) amputation of RAA underwent implantation of dual-chamber pacemakers. X-ray, threshold, sensing, impedance, average implantation exposure time and lead-related complications were evaluated at implantation (D0), and at 1, 3, 6, 12, 24, and 36 months.

RESULTS All leads were successfully implanted. Over long-term follow-up, all leads remained stable as evidenced by X-ray. Initial sensing of both groups were equal and stable in both groups. Impedance declined slightly ($P>0.05$) from D0 to M1 and remained stable thereafter. Threshold of atrial pacing lead decreased significantly during the first 3 months and remained stable thereafter while the threshold of ventricular pacing lead remained stable throughout the whole study, with neither of them showing significant difference between groups. No lead-related complications were found.

CONCLUSIONS Active-fixation atrial pacing leads can be successfully fixed to the bottom of the residual appendage in patients undergone amputation of RAA with overall good and stable long-term parameters.

GW26-e1241

Does Anemia Cause QT Prolongation in Patients with Hematologic Disorders?

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OBJECTIVES The prolongation of QT interval is associated with cardiovascular mortality and morbidity. QT prolongation is common in patients with sickle cell disease and it is reported that a lower hemoglobin level correlates with a longer QT interval in these patients. Such correlation, however, has not been determined in patients with other types of hematologic disorders. This study aims to investigate whether there is an association between reduced hemoglobin and QT interval in patients with anemia caused by disorders other than sickle cell disease.

METHODS ECGs of patients with hemoglobin (Hgb) <10 g/dl enrolled from our Hematology Department were evaluated for the presence of QT prolongation using Bazett's formula for heart rate corrected QTc. In subjects with QRS duration >120 ms, JT index (JTI=JT(HR+100)/518) was applied to estimate their repolarization time. It is reported that JTI > 112 is an indication of delayed ventricular repolarization. Among study subjects (Hgb 8.0±1.6 g/dl, range 1.9-9.9 g/dl), moderate anemia (Hgb 6-9 g/dl) accounted for 56% and severe anemia (Hgb <6 g/dl) for 12%. Anemia was related to leukemia in 40% (121/300), lymphoma in 28%, myelodysplastic syndrome in 9%, multiple myeloma in 8%, aplastic anemia in 4%, and the remainder with other types of hematologic disorders. None of the patients had left ventricular hypertrophy, electrolyte abnormalities, or were receiving QT-prolonging drugs.

RESULTS The average QTc in 300 patients with hematologic disorders was 414 ± 23 ms. There were 21 patients with a QTc >440 ms. Nevertheless, 33% (7/21) of them had a prolonged depolarization time (QRS duration ≥120 ms) including complete left (4), right bundle branch blocks (1) and right ventricular pacing (2), respectively. Their JT index were all <112 ms, suggesting the repolarization time was normal. Therefore, only 5% (14/300) of all anemic patients had a borderline to moderate QTc prolongation (461± 13 ms, range: 441-479 ms) and none of them experienced syncope, cardiac arrest, or sudden death. Linear regression analysis showed no significant correlation between reduced hemoglobin level and QT prolongation (P=0.587). To determine whether the severity of anemia affects QTc interval, study subjects were then divided into three groups separated by Hgb levels. The result of ANOVA showed no statistical significance between the lengths of QTc in the 3 groups (P=0.656).

CONCLUSIONS In anemic patients without left ventricular hypertrophy, electrolyte imbalances, use of QT-prolonging drugs, or any other identifiable causes of ALQTS, the QT interval is normal in most cases, and there is no significant correlation between hemoglobin level and QT interval.

GW26-e1027

Electric Pulse Current Stimulation promotes mShox2 Genetically Modified Canine Mesenchymal Stem Cells generating If current

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OBJECTIVES To investigate whether mShox2 genetically modified canine mesenchymal stem cells (cMSCs) induced by electric pulse current stimulation (EPCS) could generate If current in vitro.

METHODS The cMSCs were transfected with pLentis-mShox2-RFP or pLentis-RFP. After EPCS induction, these cells were designed into four groups: the RFP transfected cMSCs (Group A as control), the RFP transfected cMSCs induced by EPCS (Group B), the mShox2-RFP transfected cMSCs (Group C), and the mShox2-RFP transfected cMSCs induced by EPCS (Group D). We examined the kinetic characteristics of generated inward current by patch-clamp. We then evaluated Nkx2.5, Tbx3, HCN4, Cx43 and Cx45 expression using qRT-PCR and Western blotting.

RESULTS The time-and voltage-dependent inward current recorded in group C was confirmed as the I_f current. After EPCS induction, the detection rate of this I_f current was increased (Group D), the current amplitude and density were extend. However, there were no I_f current in groups A and B. Compared with the control group(Group A), Tbx3, HCN4, Cx45 were significantly up-regulated but Nkx2.5, Cx43 were down-regulated in groups C and D. Whereas Nkx2.5 and Cx43 were up-regulated in group B.

CONCLUSIONS Our results suggest that EPCS can promote the differentiation of mShox2 genetically modified cMSCs into pacemaker-like cells, generating If current.

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Successful Treatment of a LQT8 Case with Mexiletine: 4 years of experience

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OBJECTIVES Timothy syndrome (TS), also known as LQT8, is caused by dominant gain-of-function mutations in Cav1.2. Previously, we