PO-634-08

PULSED FIELDABLATION FOR PAROXYSMAL ATRIAL FIBRILLATION IS SAFE FOR THE ESOPHAGUS

Kars Neven MD, PhD; Anna Fütting MD; Dennis Höwel MD; Gilbert Rahe MD; John Bell MD and Nico Reinsch MD

Background: Thermal LA ablation, like RF, cryo and laser can cause esophageal damage, like ulcer and atrio-esophageal fistula. Pulsed field ablation (PFA) is a novel, non-thermal ablation modality. Pre-clinical evaluation of PFA showed absence of thermal injury to the esophagus due to the tissue specificity of PFA. Only limited data from very small clinical studies on absence of esophageal injury after PFA is available.

Objective: We report on possible esophageal injury after PVI using PFA for paroxysmal AF in a real-world, non-clinical study setting.

Methods: A LA bipolar voltage 3D map was created. All PVs were individually isolated using a 13F steerable sheath and a pentaspline over-the-wire PFA catheter. After ablation, mapping was repeated to assess lesion formation. No proton-pump inhibitors were started. One day after PVI, esophagoscopy without biopsies was performed. All patients had a 30-day follow-up.

Results: In 30 patients (mean 63 years; 47% male), uncomplicated PFA was performed, with all PVs acutely isolated. Post ablation, all voltage maps consistently showed extensive antral PV lesions. ACT was >325 seconds in all patients. Clinical course was uneventful, no patient had chest discomfort, coughing or hemoptysis. All patients underwent uncomplicated bronchoscopy, without thermal lesions or ulcers. In 12 patients (40%), small amounts of blood clots without active bleeding were seen in multiple segments. All hemoglobin levels remained stable. At 30-day follow-up, all patients were asymptomatic.

Conclusion: PVI using PFA for paroxysmal AF is safe for the bronchial system. PFA using a straight tip, extra-stiff wire can lead to asymptomatic blood oozing in the bronchial system without clinical relevance at 30-day follow-up.

Figure: Poster-anterior LA view before (left) and after (right) ablation with the trachea and main bronchi (dark grey) projected over the roof and posterior wall. The right bipolar voltage 3D map shows extensive, non-magenta antral ablation lesions.

PO-634-07

PULSED FIELDABLATION FOR PAROXYSMAL ATRIAL FIBRILLATION IS SAFE FOR THE BRONCHIAL SYSTEM

Kars Neven MD, PhD; Anna Fütting MD; Dennis Höwel MD; Lenny Brokkaar MD; Annika Essling MD and Nico Reinsch MD

Background: Thermal LA ablation, like RF, cryo can cause bronchial damage, like hemorrhagic lesions, atrio-bronchial fistula and severe bleedings. Pulsed field ablation (PFA) is a novel, non-thermal ablation modality.

Objective: We report on possible bronchial injury after PVI using PFA for paroxysmal AF.

Methods: Forty-five consecutive patients underwent de novo radiofrequency (RF) atrial fibrillation catheter ablation procedure. A new open-irrigated tip catheter with CF and LI measurement capabilities (Stablepoint catheter, Boston Scientific) was used. RF power was set at ≥45 W. During RF delivery, it was recommended to reach and maintain displayed CF values between 5 and 40 g. Ablation endpoint was PVI. Data are reported as mean±DS.

Results: A total of 2895 point-by-point RF applications were analyzed (RF delivery time (DT)=8.7±4s, CF=13±8g, LI drop=23±7%). All PVs were successfully isolated with an overall procedure time of 118±34min (fluoroscopy time=13±8min). The magnitude of LI drop was weakly correlated with CF (R=0.13, 95% confidence interval (CI): 0.09 to 0.16, p<0.0001) whereas both CF and LI drop inversely correlated with DT (R=−0.26, 95%CI: −0.29 to −0.22, p<0.0001 for CF; R=−0.36, 95%CI: −0.39 to −0.33, p<0.0001 for LI, respectively). FigA. For each 5 grams of CF, LI drops markedly increased from 22.2 to 24.6 at 5 to 25g CF intervals, whereas it has a smooth transition over 25g (24.6±2.1 at 25-29g and 25g at >30g CF intervals). FigB. No major complications occurred during or 30-day after the procedures.

Conclusion: CF significantly impact effective lesion formation during RF PV isolation. The benefit of higher contact between the catheter and the tissue over 25g of CF appears to have less impact on the increase of LI drop.

Figure: Postero-anterior LA view before (left) and after (right) ablation with the trachea and main bronchi (dark grey) projected over the roof and posterior wall. The right bipolar voltage 3D map shows extensive, non-magenta antral ablation lesions.

PO-634-07

PULSED FIELDABLATION FOR PAROXYSMAL ATRIAL FIBRILLATION IS SAFE FOR THE BRONCHIAL SYSTEM

Kars Neven MD, PhD; Anna Fütting MD; Dennis Höwel MD; Lenny Brokkaar MD; Annika Essling MD and Nico Reinsch MD

Background: Thermal LA ablation, like cryo can cause bronchial damage, like hemorrhagic lesions, atrio-bronchial fistula and severe bleedings. Pulsed field ablation with the trachea and main bronchi (dark grey) projected over the roof and posterior wall. The right bipolar voltage 3D map shows extensive, non-magenta antral ablation lesions.

Methods: A LA bipolar voltage 3D map was created. All PVs were individually isolated using a 13F steerable sheath and a pentaspline over-the-wire PFA catheter. After ablation, mapping was repeated to assess lesion formation. One day after PVI, bronchoscopy without biopsies was performed. Serial hemoglobin levels were measured during 30-day follow-up.

Results: In 30 patients (mean 63 years; 47% male), uncomplicated PFA was performed, with all PVs acutely isolated. Post ablation, all voltage maps consistently showed extensive antral PV lesions. ACT was >325 seconds in all patients. Clinical course was uneventful, no patient had chest discomfort, coughing or hemoptysis. All patients underwent uncomplicated bronchoscopy, without thermal lesions or ulcers. In 12 patients (40%), small amounts of blood clots without active bleeding were seen in multiple segments. All hemoglobin levels remained stable. At 30-day follow-up, all patients were asymptomatic.

Conclusion: PVI using PFA for paroxysmal AF is safe for the bronchial system. PFA using a straight tip, extra-stiff wire can lead to symptomatic blood oozing in the bronchial system without clinical relevance at 30-day follow-up.

Figure: Poster-anterior LA view before (left) and after (right) ablation with the trachea and main bronchi (dark grey) projected over the roof and posterior wall. The right bipolar voltage 3D map shows extensive, non-magenta antral ablation lesions.
antral PV lesions. Clinical course was uneventful, no patient had chest discomfort, coughing or hematemesis. All patients underwent uncomplicated esophagoscopy, without thermal lesions or ulcers. At 30-day follow-up, all patients were asymptomatic.

**Conclusion:** In a real-world, non-clinical study setting, PVI using PFA for paroxysmal AF is safe for the esophagus.

**Figure:** Postero-anterior LA view before (left) and after (right) ablation with the esophagus (dark grey) projected over the posterior wall. The right bipolar voltage 3D map shows extensive, non-magenta antral ablation lesions.

**PO-635-01**

**REDUCTION OF FAR-FIELD POTENTIALS USING CLOSE-UNIPOLAR ELECTROGRAMS IN A NOVEL ULTRA-HIGH RESOLUTION CATHETER MAPPING SYSTEM: EVALUATION IN A SWINE ATRIAL LINEAR LESION MODEL**

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**Background:** In complex atrial substrate with multiple atrial potentials, unipolar electrograms (EGM) referenced to the Wilson Central Terminal (WCT) are often timed to the wrong component due to large, steep far-field potentials (FP).

**Objective:** To evaluate the ability of close-unipolar electrograms (CUE) to reduce FP in a novel ultra-high resolution mapping system (IsoSense, Biosense Webster) using a swine model.

**Methods:** In 6 swine, linear RF ablation was performed in the RA to create complex patterns of activation. The RA was mapped during atrial pacing using an 8F catheter with deployable mini-basket (18 mm diameter) of 10 splines of 10 electrodes (total 100 outward facing tiny electrodes, 0.5 mm² area, 1.7 mm center-to-center) and a central non-contact electrode for CUE reference (Fig). The system generated chamber geometry and simultaneous activation maps using timing based on either: 1) CUE (between each of the 100 electrodes and the non-contact reference electrode); or 2) 100 conventional unipolar EGMs using the WCT reference (WCT-UE). CUE and WCT-UE maps were compared at sites exhibiting complex EGM.

**Results:** Fig. Activation maps of the entire RA (median 5,208 mapped points) were obtained in median 6.4 min. CUE significantly reduced far-field atrial and ventricular EGM while enhancing local near-field EGM. CUE provided more accurate timing of EGM based on maximum negative dV/dt at sites with complex atrial EGM. WCT-UE often falsely annotated timing on large FP. CUE activation maps accurately identified the location of lines of block with sharp demarcation in all 6 swine.

**Conclusion:** The new ultra-high resolution mapping system using CUE significantly reduced FP and improved mapping accuracy in the area of complex atrial EGM.

**PO-635-02**

**FACTORS ASSOCIATED WITH INFUSION NEEDLE RADIOFREQUENCY ABLATION FAILURE IN PATIENTS WITH REFRACTORY VENTRICULAR TACHYCARDIA**

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**Background:** We have previously described infusion needle catheter ablation (INCA) using endhole irrigation (Biosense Webster, Inc) for treatment of VT in 31 patients refractory to medications and conventional catheter ablation (CA). While INCA was safe with high procedural success, a significant number of patients had VT recurrence.

**Objective:** To identify the factors associated with unsuccessful INCA.