provided the best discrimination (C-statistic 0.75). PVS inducibility had a 76% sensitivity and 68% specificity (log-likelihood ratios of 2.4 and 0.42 for inducible and non-inducible pts). In pts with a calculator-predicted risk of VA <25% over 5 years (i.e., low/intermediate subgroup), inducible VT was associated with a 40.9% positive predictive value and a 93.0% negative predictive value.

**Conclusion:** Sustained VT inducibility by PVS significantly improved risk stratification above and beyond the calculator-predicted risk of VA in a primary prevention cohort of pts with ARVC.

---

**PE-565-03**

**NON-INVASIVE IDENTIFICATION OF SLOW CONDUCTING ANATOMICAL ISTMUSES IN PATIENTS WITH TETRALOGY OF FALLOT BY 3-DIMENSIONAL LATE GADOLINIUM ENHANCEMENT CARDIOVASCULAR MAGNETIC RESONANCE IMAGING**

Yoshitaka Kimura MD, PhD; Justin Wallet MD; Nico A. Blom MD, PhD; Hildo J.J. Lamb and Katja Zeppenfeld MD, PhD

**Background:** Patients with repaired tetralogy of Fallot (rTOF) remain at risk of sudden cardiac death due to sustained monomorphic ventricular tachycardia (SMVT). The majority of SMVTs are related to slow conducting anatomical isthmuses (SCAI) in particular to SCAI3 at the outlet septum, bordered by the pulmonary annulus and the ventricular septal defect patch. Electroanatomical mapping (EAM) is the invasive gold standard to identify SCAls; non-invasive characterization of SCAls has not been established.

**Objective:** The study aims to evaluate whether 3D late gadolinium enhancement cardiovascular magnetic resonance (3D LGE-CMR) can identify SCAls.

**Methods:** Consecutive patients with rTOF who underwent right ventricular (RV) EAM and 3D LGE-CMR were included. LGE-CMR-derived 3D RV reconstructions were created (ADAS 3D) and merged with RV EAM data. Mapping points were superimposed on the CMR-derived 3D reconstruction allowing for direct comparison of EAM data and local signal intensity (SI). The optimal SI cut-off to identify low bipolar voltage (LBV, BV<1.76mV) was determined. An abnormal Al on LGE-CMR was defined as Al with continuous high SI connecting Al borders.

**Results:** Forty-six rTOF patients (34±16 years, 57% male) were included. At EAM, 20 patients had normal Al, and 19 and 7 had a SCAI (<0.5m/s) or blocked Al, which was Al 3 in all. In 11 patients, 14 SMVTs could be induced, which were all related to SCAI3. A total of 8979 points were analyzed, showing a significant correlation between BV and SI (R=0.39, P<0.001). The optimal SI cut-off to identify LBV was 42% of the maximal SI (MSI) (AUC 0.79; sensitivity, 74%; specificity, 78%). Using this cut-off a SCAl or blocked Al3 could be correctly identified by LGE-CMR in all 26 patients and a normal Al3 could be confirmed in 13/20 patients with normal EAM findings (Figure). The sensitivity and specificity of 3D LGE-CMR for identifying SCAl or blocked Al3 were 100% and 65%, respectively. Of note, among patients with normal EAM findings, those with abnormal Al3 on LGE-CMR had lower BV of Al3 than those with normal Al3 on LGE-CMR. (2.06 [Range, 1.62-2.60] vs. 3.53 [2.22-5.67] mV, P<0.01).

---

**PILOT HOLE ASSISTED TRANSSEPTAL PACING TO AVOID DYSSYNCHRONY: THE PHAT PAD TECHNIQUE**

Steven B. Fishberger MD, CEPS-P; Charles C. Anderson MD, CEPS-P and Richard Jensen MD

**Background:** It is recognized that right ventricular pacing results in left ventricular dysfunction, heart failure, and decreased quality of life. Biventricular pacing via the coronary sinus and His bundle pacing have been beneficial, though these methods have significant limitations. Left bundle branch pacing has emerged as an alternative for physiologic pacing, however achieving this is challenging in some patients.

**Objective:** The PHAT PAD technique describes a method to reliably pace the left bundle branch. This technique provides access to the left bundle via a transseptal approach.

**Methods:** A deflectable sheath is positioned along the midportion of the right ventricular septum. Under fluoroscopic and transesophageal guidance, a radiofrequency wire is advanced through the septum into the left ventricle. A dilator is advanced over the wire into the septum, creating a pilot hole, and the wire is retained across the septum in the sheath, advanced through the septum into the left ventricle. A Medtronic 3830 lead is advanced through the sheath along the wire into the pilot hole. Pacing is performed to confirm left bundle pacing by the demonstration of right bundle branch block on the surface ECG. Repeat echocardiographic imaging is used to evaluate function and determine if there is any ventricular level shunt.

**Results:** The PHAT PAD technique was used to attempt left bundle transvenous pacing in 2 patients, ages 18 and 76 years. Both achieved right bundle branch block (RBBB) on surface ECG with a QRS duration of 120 and 125 ms. By transesophageal imaging, patients had normal left ventricular function and there was no evidence of a ventricular septal defect. At 5 month follow up for both patients, RBBB was still present and capture thresholds where < 1.0 volt at 0.4 ms.

**Conclusion:** This proof of concept study describes a technique that enhances the ability to achieve physiologic left bundle pacing. Intermediate results are encouraging, however long term follow up and a larger patient cohort is necessary.
Conclusion: 3D LGE-CMR can identify SCAI with 100% sensitivity, which may contribute to risk stratification and patient selection for invasive EAM.

ABSTRACT EN-580:
Women in EP: It's Time to Talk About the Money!
Closing the Gender Pay Gap in EP

Saturday, April 30, 2022
12:30 PM - 2:00 PM

EN-580-01
RISK PREDICTION TOOL FOR CARDIAC PERFORATION DURING TRANSVENOUS LEAD EXTRACTION: A CANADIAN LEAD EXTRACTION RISK (CLEAR) STUDY SCORE
Michelle Samuel; Blandine A. Mondesert; Francois Philippo; Arthur Lee; Paul Khairy; Jason G. Andrade; Jean-francois Legare; Robert J. Cusimano; Lynn Fedoruk; Shahzad S. Karim; Andrew D. Krahn; Derek V. Exner; Mouhannad Sadek; Ratika Parkash and Jamil Bashir

Background: Cardiac perforation is a potentially life-threatening complication of transvenous lead extraction. Despite procedural advances in technology and techniques, the incidence is significant at 1 to 3%. A risk prediction tool is warranted to identify patients with an elevated risk of perforation prior to lead extraction to improve surgical planning and safety.

Objective: Our objective was to develop and validate a risk prediction score for cardiac or vascular perforation among cardiac implantable electronic device patients undergoing lead extraction.

Methods: The multicentre Canadian Lead ExtrAction Risk (CLEAR) study was used to develop the score. The study examined patients who underwent transvenous lead extraction to ascertain the incidence and risk factors for perforation (1996-2016). Potential predictors of perforation were incorporated into a multivariable least absolute shrinkage and selection operator (LASSO) logistic regression to determine the risk model. The model was internally validated with bootstrapping and model discrimination was calculated.

Results: Of 2,325 patients who underwent a lead extraction (age 61.9 years, 29.0% women), 63 (2.7%) patients had a perforation within 30 days. Female sex and no prior cardiac surgery were the most significant factors associated with perforation, followed by the number of leads extracted (>=2), left ventricular ejection fraction (>=40%), and logarithm of lead age (years). Model discrimination was strong [area under the curve (AUC) = 0.79 (95% CI 0.73-0.84)] and the score accurately predicted the risk of perforation (Figure 1).

Conclusion: Individual patient risk for perforation from lead extractions can be accurately predicted from the CLEAR score.

EN-580-02
ATRIAL PACING INDUCED OVERSENSING IN SUBCUTANEOUS IMPLANTABLE CARDIOVERTER DEFIBRILLATOR
Amy Louise Wharmby BSc; James Elliott; Christopher A. Monkhouse BS, CCDS; Charles Butcher MBBS, PhD and Pier D. Lambiase BCH, BM, MBChB, PhD, FHRS

Background: A 23 year old male with hypertrophic cardiomyopathy, was implanted with a Subcutaneous Implantable Cardioverter Defibrillator (S-ICD) (Cameron Health SQ-RX 1010). Four years later the patient developed symptomatic bifascicular block and a dual chamber pacemaker (PPM) (Biotronik Epyra-6) was implanted.

Objective: To highlight the potential challenge of interactions between an S-ICD and atrial pacing.

Methods: N/A

Results: The PPM was programmed DDD with a lower rate of 60 bpm and an upper rate of 150 bpm. The S-ICD conditional and shock zones were set to 250 bpm, in the Secondary vector. Primary and Alternate vectors were not viable options due to oversensing of the patient’s intrinsic rhythm and smart pass filtering unavailable on this device model. Two months post PPM insertion, an untreated episode was detected by the S-ICD displaying intermittent triple counting of the P, R and T-wave (Figure 1). Consequently simultaneous interrogation of the PPM and S-ICD was performed. Upon conducting the atrial threshold test in AAI mode, the S-ICD P-wave oversensing was replicated (Figure 2).

The paced P-wave amplitude was similar to that of the intrinsic R-wave (Figure 1 circled in red) resulting in sensing of both components. S-ICD sensing utilises auto gain control whereby the average amplitude of the last two sensed signals is taken and the decay to sensing floor begins at 75% of this calculated amplitude. As the interval between sensed beats decreases, the shorter the refractory period and more aggressive the decay to ensure appropriate sensing of small amplitude signals, typically seen during ventricular fibrillation. A fortuitous ventricular ectopic (figure 1 highlighted in green) resets the sensing profile as the