

### 31 CLINICAL OUTCOMES OF TRANSFEMORAL VS TRANSAPICAL TAVI: UK SINGLE-CENTRE EARLY TAVI EXPERIENCE

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**Background** Transcatheter Aortic Valve Replacement (TAVI) started at Barts Health NHS Trust (London Chest Hospital) in 2008. It was the beginning of a new era for patients with severe aortic stenosis who were not fit enough for surgery; giving another treatment opportunity to our patients.

**Methods** Data was collected on patients who underwent TAVI between January 2009-January 2015, comparing transapical (TA) and transfemoral (TF) approaches using appropriate statistical tests. The clinical outcomes included 30 day mortality, mean Log-EuroScore, renal function and complications.

**Results** Over the 6 years, there was a total of 79 TA (39.1%) and 123 TF (60.9%) TAVI procedures. 30 day mortality included TA 3.8% Vs TF 4.1% ( $p=0.213$ ); with Mean Log-EuroScore being 19.68 TA and 20.07 TF ( $p=0.879$ ), which improved over the years. Mean hospital stay for TA was 13 days and TF was 11 days.

Patients who had an  $eGFR < 60$  and received a contrast volume  $> 150$  ml was 36.8% in TA patients and 35.8% in TF patients. With the former patient group, TA patients had a statistically significant post-TAVI AKI with worsening  $eGFR$  than TF ( $p=0.0013$ ). Also, these TA patients had a longer hospital admission (mean=18.14 days) compared to TF (mean=10.32 days). Those patients with  $eGFR < 60$  and received  $< 150$  ml contrast had similar outcomes in TA patients ( $p < 0.0001$ ) however there was a 1 mean day difference in hospital stay.

The complications during TAVI procedures included major bleeding (TA 6.33% Vs TF 9.76%  $p=0.081$ ), arrhythmia/cardiac arrest (TA 3.80% Vs TF 0.81%  $p=0.408$ ) and cardiac tamponade (TA 0% Vs TF 4.07%  $p=0.185$ ). Other complications like para-prosthetic leak accounted for TA 8.47% Vs TF 14% ( $p=0.700$ ), and intra-operative regurgitation TA 11.43% Vs 21.28% TF ( $p=0.589$ ).

**Conclusions** Both TA and TF approaches were observed to have similar clinical outcomes over those 6 years, except for those TA patients with poor renal function ( $eGFR < 60$ ), who face worsening post-TAVI AKI and requiring longer hospital stay for recovery; despite the contrast volume received. Overall, TAVIs have been successful at Barts Health since it began, therefore the number of cases is expanding every year.

## Cardiac Rhythm Management

### 32 GLOBAL HIGH DENSITY MAPPING OF RE-ENTRY VULNERABILITY INDEX AIDS RISK STRATIFICATION AND IDENTIFIES SITES OF ARRHYTHMIA INITIATION IN BRUGADA SYNDROME AND ARVC

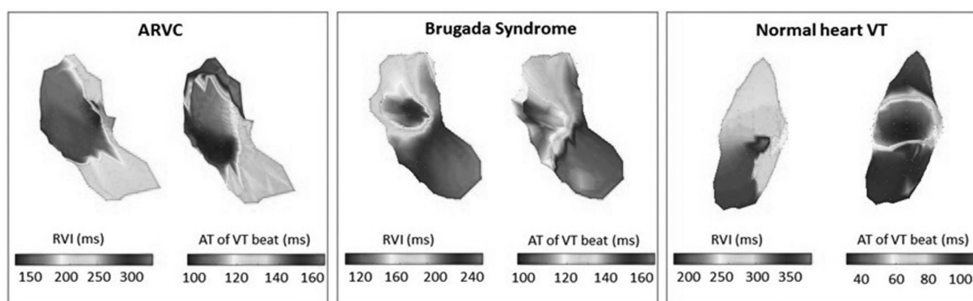
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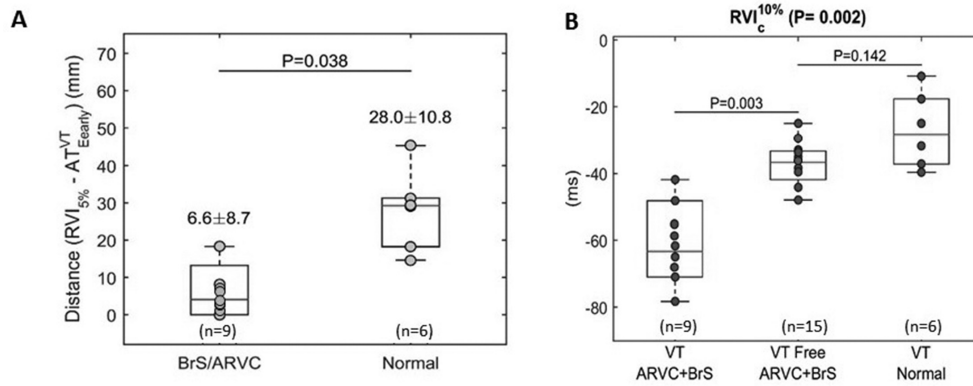
**Introduction** Initiation of reentrant ventricular tachycardia (VT) involves complex interactions between activation (AT) and repolarization times (RT). Recently, an algorithm has been developed to generate a spatial map (designated the re-entry vulnerability index-RVI) from intervals between local ATs and RTs at adjacent points over a multielectrode grid. The algorithm has been shown to accurately identify the region of a macro-reentrant circuit in two animal models (1). The aim of this study was to test the feasibility of RVI mapping in the right ventricle (RV) to aid ablation strategy of reentrant arrhythmias.

**Methods** Patients with Arrhythmogenic Right Ventricular Cardiomyopathy (ARVC) ( $n=10$ ), Brugada Syndrome (BrS) ( $n=14$ ) and normal heart RV outflow tract (RVOT) VT ( $n=6$ ) underwent electrophysiological studies and were followed up for  $113 \pm 21$  months post procedure. Unipolar electrograms were recorded from a non-contact array (St Jude Medical) placed in the RVOT and geometry created with the Ensite system. Recordings were made during a programmed electrical stimulation protocol consisting of a 600 ms drive train and S2 extras. ATs and RTs were computed from the unipolar electrograms and the RVI calculated as previously described (1). Minimum 10% of global RVI values corrected for cycle length ( $RVI_c^{10\%}$ ) and distance between region of lowest 5% of RVI values and region of earliest activation during VT ( $D_{min}$ ) were computed for each patient.

**Results** Shortest values of RVI, which represent sites of highest susceptibility to re-entry, co-localised with earliest activation point during VT in the 9 patients with ARVC/BrS where VT was initiated (figure 1). In the ARVC patients this corresponded with location of RV scar as seen on MRI. In the 6 patients with normal heart focal VT, regions of lowest RVI did not co-localise with VT origin. Distance between region of lowest RVI and region of earliest activation during VT,  $D_{min}$ ,



Abstract 32 Figure 1



Abstract 32 Figure 2

was significantly lower in BrS and ARVC than in normal heart VT (Fig 2A). In both ARVC patients  $D_{min}=0$ , indicating region of lowest RVI overlapped with region of earliest VT activation.

Of the patients with ARVC/BrS, those with inducible VT or clinical VT at follow-up had significantly lower minimum values of  $RVI_c$  than those without ( $-61.0 \pm 13.8$  ms vs  $-37.1 \pm 7.1$  ms) (Fig 2B). Patients with normal heart VT had highest values of  $RVI_c$  ( $-27.0 \pm 11.3$  ms).

**Conclusion** An algorithm based on relative local ATs and RTs identifies localised regions of high susceptibility to conduction block and re-entry, with lowest RVI values localising VT origin of reentrant but not focal arrhythmias.

This index could be applied to:

1. Risk stratify ARVC/BrS patients to target ICD prophylaxis.
2. Target ablation for reentrant arrhythmias which are difficult to induce or are haemodynamically unstable, without need for arrhythmia initiation.

**REFERENCE**

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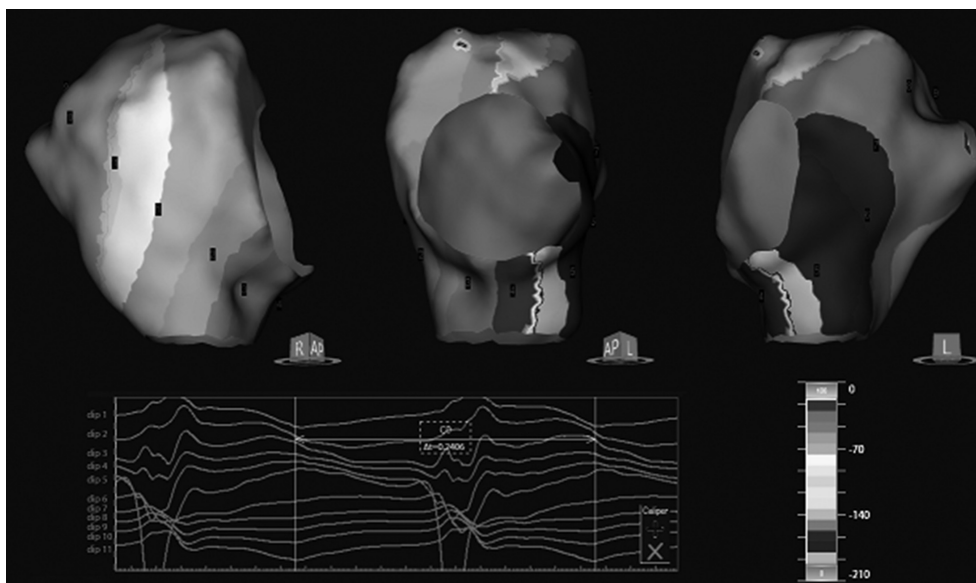
**33 USE OF NOVEL GLOBAL ULTRASOUND IMAGING AND CONTINUOUS DIPOLE DENSITY MAPPING TO GUIDE ABLATION IN MACRO-REENTRANT TACHYCARDIAS**

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**Introduction** Persistent AF (PeAF) ablation continues to be a challenge, primarily because the mechanism of AF is not clearly defined and even when successfully ablated may evolve into multiple atrial tachycardias or flutters (AT/AFL) during the course of a procedure. Sequential mapping with existing 3D mapping systems can make procedures long and complex. We report the use of a novel simultaneous non-contact ultrasound (US) imaging and mapping system (AcQMap) to characterise of AT/AFL during PeAF ablation.

**Methods** The AcQMap system consists of a basket catheter (48 US transducers, 48 electrodes) which simultaneously acquires 100,000+ US points/min to reconstruct chamber anatomy and 1 50 000 intracardiac unipolar voltage points/



Abstract 33 Figure 1