Cardiac device lead clots and cardiac ablation: mitigating the potential for Peri-procedural stroke?

An increasing number of patients receive implanted cardiac devices to ensure adequate beating of the heart (pacemakers), prevent sudden cardiac death from life - threatening rhythm disturbances (implantable cardioverter - defibrillator (ICDs)), as well as improve heart pumping function (cardiac resynchronization therapy (CRT)). Paralleling the rise in cardiac device implantation is the number of patients undergoing cardiac catheter ablations in order to destroy tissue responsible for inciting heart rhythm problems. A common, though often overlooked issue in this subset of patients, is the propensity for these leads to develop clot or thrombus.

During many catheter ablation procedures, access from the right side of the heart (where cardiac leads are dwelling) to the left side of the heart requires creation of a small hole (transseptal puncture) through the septum (wall) that separates these two chambers. This can be of potential harm to the patient if thrombus is present, as it can dislodge from the right sided chamber leads, cross to the left side of the heart, and travel to the brain potentially causing a stroke (see animation). Therefore, when a lead clot is present, often there is a reluctance to proceed with transseptal puncture and subsequently the procedure is often aborted. Despite the ability to detect thrombus on device leads with multiple imaging techniques, there is a paucity of data (which is largely anecdotal) on the best practices. Thus, the management and step-wise approach prior, during, and in the follow-up period remains grossly undefined, with many key questions unanswered. With this lack of clear guidance on device lead thrombus detected during a cardiac ablation procedure, the aim of our study was to review our experience, and describe our approach, clinical course, and management strategies.

http://atlasofscience.org/wp-content/uploads/2016/03/Asirvatham-Ablation-with-Lead-Thrombus.mp4

We performed an analysis of all patients who underwent a cardiac ablation procedure at Mayo Clinic Rochester from 2000 to 2014 with lead thrombus detected. In total, we identified 1833 patients who had an implanted cardiac device, with only 27 (1.4 %) having a thrombus detected. Of these 27 patients, 21 were male (77 %), and the mean age was 59.2 years. We found that intracardiac echocardiogram (ultrasound inside the heart) was the superior method for detection of thrombus. When thrombus was detected, the management approach depended upon the indication for ablation. In those that were planned to undergo an ablation for atrial fibrillation the most common management strategy was to defer ablation and use blood thinning medication to dissolve the thrombus. Subsequently many were able to undergo a repeat ablation. For ventricular tachycardia ablation, detection of thrombus resulted in a modification of the approach to access the

left side of the heart. From our data; it is clear that thinning the blood with an anticoagulant (such as warfarin) represents a largely successful approach. Anticoagulation resulted in resolution or reduction in the size of the thrombus in 11/14 patients (78.6%) and safer circumstances for the ablation procedure.

Our results highlight that in those whom have lead thrombus detected, we recommend, if safe to do so deferral of ablation and initiation or intensification of anticoagulation (warfarin) to help dissolve the thrombus. Identification and treatment of lead thrombus is critical given the potential for lead thrombus dislodgement during catheter ablation procedures. Being cognizant of the potential for stroke and management to limit this potential may best serve our patients by mitigating this risk with the use of blood thinners.

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Publication

Mobile thrombus on cardiac implantable electronic device leads of patients undergoing cardiac ablation: incidence, management, and outcomes.
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