

Coronary Artery Calcification in Pre-Atrial Fibrillation Ablation Scans: A Missed Opportunity?

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To The Editor

We read with great interest the recent article by Dunleavy et al.¹ describing the prevalence of coronary artery calcification (CAC) on pre-ablation computed tomography (CT) of the pulmonary veins (CTPV) in patients with atrial fibrillation (AF) in Ohio. Specifically, pre-ablation CT is performed as a non-gated high-pitch helical CT-scan with contrast timed for optimal pulmonary vein and left atrial opacification, followed by a 40-second delayed scan to more thoroughly evaluate the left atrial appendage for thrombus. However, the performance of pre-ablation CT-scans also offers in many patients an opportunity to identify subclinical coronary artery disease (CAD) and refine the intensity of preventive therapies. Thus, the frequency of CAC reporting on CTPV imaging, and its impact on statin prescriptions at time of hospital discharge was also investigated. The authors demonstrated that even though CAC is highly-prevalent in AF patients and is consistently reported on pre-ablation CTPV, its presence was not associated with increases in statin prescribing in eligible patients. Importantly, 34% of the studied cohort had known clinical CAD, a group in whom the presence and severity of CAC would not typically result in a change in management.

We recently reviewed 200 consecutive patients undergoing AF ablation at our academic tertiary care center from July 2017 through June 2018. Our cohort was comprised of mostly men (62%) with mean age 65 ± 11 years. Prevalence of clinical CAD was 22.5%. Of the 200 patients, 180 (90%) had CTPV prior to ablation, with 116 patients (64%) found to have CAC. Of the 116 patients with CAC on CTPV, 30 (26%) had clinical CAD. Conversely, of the 45 total patients with clinical CAD, 30 (67%) had CAC. The presence of CAC was noted in the conclusions section of only 38 (33%) of CAC-positive CTPV reports.

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In total, there were 54 patients (29%) with CAC on pre-procedure CTPV not on baseline statin therapy, and only 6 (11.1%) were newly-prescribed a statin at time of hospital discharge. All six patients remained on statin therapy for at least one year following their discharge. This represents a missed opportunity to mitigate cardiovascular risk in roughly 89% of patients with CAC.

Our results from Virginia support the important work of the authors, and highlight a consistently-missed opportunity to optimize CAD management in patients with AF. First, current prevention guidelines endorse the use of CAC for guiding decision-making in many intermediate-risk patients². A recent expert consensus statement from the Society of Cardiovascular Computed Tomography and Society of Thoracic Radiology advocates for standardized reporting of the presence and severity of CAC as visualized on non-gated chest CT scans performed for other clinical reasons (e.g. not for dedicated CAC scoring)³. Providers should utilize pre-ablation CT scans not only for procedural planning, but as an opportunity to refine patient cardiovascular risk and to better inform patients regarding the utilization and intensity of preventative therapies and lifestyle-coaching. Unfortunately, there remains significant heterogeneity in reporting of non-gated chest CT scans done for a variety of clinical indications.

Our observations support the conclusion by Dunleavy et al. and that institutions should consider initiating quality improvement protocols for optimal guideline-directed reporting and management. Going forward, we propose utilization of standardized measures of reporting CAC severity, number of coronary vessels involved, specific attention to left main CAC (a unique high-risk phenotype), and validated semi-automated measures of CAC severity in non-gated scans. This could modify the natural history of cardiovascular disease in this population.

References

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To the Editor

We are honored by the interest in our recent work by Harmone et al. We appreciate their interest in replicating our study. It is encouraging to see that others in cardiology are interested in assessing coronary calcification on CTPV, its reporting, and its impact on statin therapy.

Although the sample size in the study by Harmone et al is much smaller than ours, we agree with the authors that their findings are highly consistent with our study. First, the prevalence of coronary artery calcification (CAC) on pre atrial fibrillation (AF) ablation computed tomography pulmonary venogram (CTPV) is high in both studies (64% in Harmone et al vs 70% in ours). Second, both studies show that there was a very minimal change in statin therapy at the time of hospital discharge.

We find their lower rate of CAC reporting interesting, yet not surprising. Our study showed a much higher rate of CAC reporting 92.3% vs 33%. While there is a clear guideline requiring the reporting of CAC in non-contrast chest CT(1), there is no clear consensus about reporting CAC on contrasted chest CT scan. We were pleasantly surprised by our high CAC reporting rate in our lab and we attributed that to the fact that all CTPV scans are read by cardiologists who are well versed in the clinical implications of coronary calcification.

In conclusion, both studies show that CAC is highly prevalent in AF patients even in those with no history of clinical atherosclerotic disease. The variable reporting rates of CAC on CTPV reports show the large difference in CAC reporting practice between institutions and highlight the need for radiological and cardiology societies to come up with a consensus document or guidelines (similar to the one for the non-contrast chest CT) to clarify when and how CAC should be reported on contrast-enhanced Chest CT scans. At the same time, quality improvement studies are needed to show that reporting CAC score would hopefully lead to improve statin prescription to this high-risk population and ultimately to improve patient outcomes.

Sincerely,

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