EXPERT COMMENTARY

Fluoroleless Ablation: To do now, or to do later, that is the question

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Over the last 25 years, radiofrequency ablation for cardiac arrhythmias has been honed by many to a precise technique with well-delineated step wise approaches for a wide variety of supraventricular and ventricular dysrhythmias. However, electrophysiologists are still challenged by with 3 main controversies: 1) Ablation for persistent atrial fibrillation beyond pulmonary vein isolation (PVI), 2) Ideal substrate modification technique(s) for ventricular tachycardia, and 3) Minimizing fluoroscopic use without compromising safety, efficiency and efficacy. Of these, we are now approaching a consensus regarding fluoroscopic use in ablation, i.e., ‘don’t use it’. From the initial proposals in the late 1990s towards reducing radiation dose in cardiac ablations, we have now moved towards a near-realization of the goal of eliminating radiation from the EP lab.

This has been facilitated mainly by a slow but dramatic improvement in electroanatomic mapping (EAM) technology, to the extent that the resolution of this technology is now at <1 mm, as good or better than standard fluoroscopy. After numerous case reports, series and retrospective studies demonstrating easy & precise catheter placement guided by EAM, it is clearly unreasonable for some to claim any superiority of fluoroscopy for this purpose. Regarding procedural safety, EAM facilitated catheter placement and ablation, using intracardiac electrogram guidance, is more precise than standard fluoroscopic techniques which rely upon the assumption of relatively normal cardiac anatomy. Recent development in contact force sensing technology is expected to translate into increase ablation efficiency and lower cardiac perforation rates.

Non-fluoroscopic (or fluoroleless) ablation is as efficacious as conventional ablation, which is not surprising as all ablation procedures are guided by fairly standard end points. Many operators, including in our lab, are now routinely performing all right sided and some left sided ablation procedures without fluoroscopy. Some of our more intrepid colleagues have progressed to the holy grail of completely fluoroleless left atrial ablation procedures, by performing solely intracardiac echocardiogram (ICE) guided trans-septal access, which has hitherto been the rate limiting step for most of us. There is really no reason to use fluoroscopy for an AF ablation other than for trans-septal access. The long vascular sheath for trans-septal access can be advanced using ICE or ablation catheter, and the NRG RF Transseptal Needle (Baylis Medical, Montreal, Canada) can be visualized on EAM, thus obviating the need for fluoroscopy in combination with ICE.¹

In addition to the published case series and retrospective cohort analyses comparing fluoroleless versus conventional ablation, we now have the results of the NO-PARTY trial which prospectively randomized 262 patients with supraventricular arrhythmias (no AF) into minimal fluoroscopic approach (MFA) and conventional ablation (ConvA) groups, and clearly demonstrated equal safety and efficacy of both approaches with no radiation exposure in the MFA group.²

There are two remaining cogs in this wheel. The first, namely need for fluoroscopic guidance for management of cardiac tamponade, is a situation where this ‘necessary evil’ cannot be avoided. The second is the perceived difficulty of the fluoroleless approach for a relatively inexperienced operator.

The manuscript by Percell et al has attempted to address this misconception. In a retrospective single-operator single-lab study of 72 patients undergoing AF ablation, they have demonstrated both a) feasibility of safe ablation of AF in a timely manner without using fluoroscopy, and b) safety of this technique in the hands of an early

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career professional. This reflects a steep curve in technical expertise in ICE use, and the rising confidence in electrophysiologists towards obviating the need for fluoroscopy in their lab. The procedural safety end points were minimal and equal in both groups, except for a single cardiac tamponade in the fluoroless ablation group. As a refinement to the authors' technique, one would suggest performing a second trans-septal puncture in an identical manner to enable a standard two-catheter technique, or using an ablation catheter to cross through the trans-septal puncture to place a second sheath through the same access. Going forward, we expect further adoption of fluoroless techniques as new fellows will be trained in these, rather than learning on their own as has been the wont for most of us. It is easy to foresee the long-term benefits of the fluoroless approach by avoiding the deterministic and stochastic effects of radiation, as outlined by the authors.

So the final question is not whether we 'should or should not' aim for minimal fluoro/fluoroless ablation, but rather 'when we should do it'. With the wide increase in ablation procedures, especially for atrial fibrillation, we have to be ready for our patients to start inquiring about our fluoro use during procedural discussion, and can we really fault them for that?

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