LETTER FROM THE EDITOR IN CHIEF

Among the many interesting manuscripts within this issue of the Journal, I’d like to briefly discuss the article from Dr. Kendig and colleagues entitled “Epicardial Ablation of Hemodynamically Unstable Ventricular Tachycardia Using CT Imaging, Three-Dimensional Electro-Anatomic Mapping of the Coronary Arteries and the Impella™ Left Ventricular Assist Device.” In particular, I’d like to discuss the emerging role and indication for the percutaneous ventricular assist device (PVAD) in high risk ablation procedures.

In this article, Dr. Kendig and coworkers describe how their use of the Impella PVAD allowed for successful ablation of a hemodynamically unstable epicardial ventricular tachycardia (VT) in a 21 year old man. This case highlights the emerging role of PVAD supported complex ablation procedures.

At our center, we have now performed 20 PVAD supported VT ablation procedures. The majority of our cases have been conducted with the Tandem Heart device, though there is experience with the Impella 2.5 as well. We have had excellent outcomes performing these ablations in sinus rhythm with scar/substrate mapping and ablation of late potentials within the scar, etc. however, in some cases we need to actually map in VT to successfully ablate the tachycardia. Similar to Kendig and colleagues, most of our cases have been done when the first ablation procedure was unsuccessful due to the need to map in VT when the VT was hemodynamically unstable.

With Tandem Heart, the device is placed via a transseptal approach, so the ablation is done retrograde across the aortic valve. The Tandem Heart provides 5 l/min support, so the patient is very well maintained hemodynamically even during prolonged mapping of very fast VTs in patients with advanced heart failure. The Tandem Heart has been placed into the Electrophysiology lab in each of our procedures and then removed following the case. As the Tandem Heart typically requires a cut-down approach, we have closed the percutaneous access site using a “Preclose with Perclose” technique. Fortunately, we have not had any significant groin complications to date. As might be expected with the access issues, the Tandem Heart generally adds 30–60 minutes of additional time to the ablation procedure.

On the other hand, with Impella, the device sits across the aortic valve so the VT ablation is mostly done from a transseptal approach. The smaller Impella device is much quicker and easier to deploy and does not require a cut-down approach. However, the smaller Impella 2.5 device only provides 2.5 l/min of support, which may be insufficient in some cases. Theoretically, an outflow tract VT may be a problem with Impella if the motor interferes with signals high in the ventricle/aortic root. But for most VTs in ischemic or nonischemic cardiomyopathies, this has not been a significant issue.

Regardless of which technology is utilized, patient selection is critical. With Tandem Heart, significant peripheral vascular disease can be an issue due to the size of both the venous intake and arterial return cannulas. Peripheral vascular disease can also be a challenge with the smaller 2.5 Impella device, as it still requires a 14F femoral artery sheath. Being facile with the “Preclose with Perclose Technique” allows for true percutaneous procedure. For patients who may require significant support, Tandem Heart or the larger Impella 5 device would be a better fit to allow for prolonged mapping in VT. Interestingly, we have found that PVADs may potentially unload the ventricle so that the VT may not be as inducible. While we have only used arterial blood pressures to monitor the level of hemodynamic support, there has been an interest in using cerebral oximetry as a monitoring tool to evaluate the effectiveness of support in addition to blood pressure monitoring.

In addition to VT ablations, PVAD support could also be used for anticipated long atrial fibrillation ablation procedures in patients with advanced heart failure. While PVAD supported VT ablations are quite “sexy”, we still do not have any data clearly demonstrating that outcomes with this approach are any better than VT ablations performed in sinus rhythm using scar/substrate mapping, etc. Regardless, the use of PVAD allows us to safely perform long
complex procedures in patients with advanced heart failure or unstable tachycardias. As these technologies continue to improve with ease of placement I would expect an increasing role for their utilization.

Within this letter I’d also like to mention the AF Ablation Innovations conference taking place this December in New York City. This highly interactive meeting has been developed to serve as a gathering of world renowned experts to host engaging forums and live case transmissions that will provide attendees with latest treatment strategies in this ever-evolving field. I truly believe in this form of education, as it presents an intimate yet comprehensive venue to discuss innovative strategies and share experiences. Please visit www.AfibInnovations.com to learn more about the course. Hope to see you there!

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