ABSTRACT

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Title: Electromagnetic Interference Complicating Impella® Use During Pediatric Ablation.
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Background: In children, the Impella® is most commonly used in the setting of cardiogenic shock. There are few reported cases of Impella® use in pediatric patients undergoing ablation; description of troubleshooting techniques may improve success rates.

Methods: This case report describes a pediatric patient with tachycardia-induced cardiomyopathy due to incessant ectopic atrial tachycardia (EAT) whose ablation was notable for significant electromagnetic interference (EMI) from the Impella® leading to incomplete mapping.

Results: A thirteen year-old, 63 kg female presented with heart failure symptoms and was found to have EAT and tachycardia-induced cardiomyopathy. An Impella CP® was used during her ablation procedure due to concern for hemodynamic instability. A CARTO3® system was used for three-dimensional mapping. Following a transseptal puncture, a PENTARAY® catheter was used for left atrial (LA) voltage and activation mapping. There was instability in the displayed mapping catheter location when the mapping catheter sensor was located in the anterior LA. This was coupled with a magnetic interference alert and an elevated mapping catheter metal value caused by a severe EMI due to proximity to the Impella®. Activation mapping near the mitral valve annulus was therefore incomplete. Troubleshooting techniques reviewed included eliminating additional sources of interference, changing the motor speed, repositioning the Impella®, and switching to an impedance-based mapping system. In this case no changes were made to Impella® or mapping system settings as the earliest atrial electrograms were seen and successful ablation was performed in the posterior LA.

Conclusions: This case highlights the need for multidisciplinary planning and consideration of the possibility of EMI with the use of magnet-based electroanatomic mapping systems as well as troubleshooting techniques to reduce the impact of EMI.

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Figure 2. A: Left atrial activation map (right posterolateral view). B: Left atrial voltage map (right posterolateral view). C: Left atrial activation map (RAO view). D: Left atrial activation map (posterior inferior view). LLPV = left lower pulmonary vein. LUPV = left upper pulmonary vein. RLPV = right lower pulmonary vein. RUPV = right upper pulmonary vein. AET = atrial ectopic tachycardia.