

Catheter Ablation Beyond the Cath Lab: Early Experience from a Single Institution

Amee M. Bigelow, MD, Grace L. Smith, MD, John R. Lane, MD, John M. Clark, MD

Purpose

Three-dimensional mapping has significantly reduced radiation exposure during catheter ablation procedures. Many institutions are now routinely performing ablations without the use of fluoroscopy. As institutions gain more experience in zero-fluoroscopy procedures, there is less need for permanently mounted, fixed fluoroscopic C-arms. The traditional cath lab, as it pertains to electrophysiology, is therefore being redefined. Newer mapping systems allow catheter ablations to be carried out in non-traditional locations. We report our series of 37 patients who underwent catheter ablation in a standard operating room (OR) utilizing 3D mapping.

Methods

There are 3 major components to catheter ablation equipment: the recording system, the navigation system, and the energy generator. Current navigation tools include fluoroscopy and 3D mapping systems. Each of these components has been made portable and can be transported to any suitable procedure room. The most important consideration for location is that the room and bed must accommodate portable fluoroscopy, if needed. For the present report, a standard OR was used. All procedures were done under general anesthesia. A femoral venous sheath was placed and a catheter advanced to the right atrium using 3D navigation (Ensite Velocity, St. Jude Medical.) A 3D geometry was then created by techniques previously reported. Additional sheaths were then placed. Mapping and ablation were carried out by standard protocols. Ultrasound and portable fluoroscopy were available, but never needed. Patients considered for an OR procedure must have weight >15 kg, have no complex congenital heart disease, have no transvenous pacing devices, and not require diagnostic or interventional catheterization.

Results

Between October 2013 and July 2014, 37 patients underwent catheter ablation in the OR. Twenty patients had accessory pathways, of which 14 were manifest and 6 were concealed. Thirteen had AVNRT, two AET, one atrial flutter, and one patient with PVCs. Patient age ranged from 4 to 23 years, with mean of 13.4 and weight ranged from 16.7kg to 129.5kg, with mean 54.2kg. Acute success was achieved in all patients. Cryoablation was used for AVNRT and RF ablation was used for accessory pathways. Mean procedure time was 149 minutes (range 57 to 408minutes). There were 9 left sided pathways, 8 of which required trans-septal puncture, which was guided by TEE, while one patient had a PFO. There were no complications. No fluoroscopy was used for any of the cases.

Conclusion

This case series demonstrates our early experience of performing catheter ablation outside of the cath lab. Portability of ablations may have beneficial effects including minimizing scheduling conflicts in the cath lab and improved cost effectiveness. It may also be useful for the critically ill patient where an ablation could be performed in the ICU. As the technology continues to evolve, the ideal candidates for ablation outside the cath lab will be better defined.