G13 Cavotricuspid Isthmus Rupture and Hemopericardium: A Delayed Complication of Cardiac Radiofrequency Catheter Ablation

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After attending this presentation, attendees will become aware of delayed fatal complications of cardiac radiofrequency ablation.

This presentation will impact the forensic community and/or humanity by providing heightened awareness of potential complications of cardiac radiofrequency ablation that may occur weeks or months following the procedure.

Radiofrequency ablation (RFA) has been used in humans since 1981 for the treatment of cardiac dysrhythmias. Numerous studies have shown that it has a high success rate with infrequent complications. The indications for RFA include atrioventricular (AV) nodal re-entrant tachyarrhythmias, accessory pathway dysrhythmias, focal atrial tachycardia, atrial flutter and idiopathic ventricular tachycardia. Reported complications include AV block, post-pericardiotomy syndrome, atrio-esophageal fistula, coronary artery stenosis, acute hemopericardium, and delayed right ventricular aneurysm.

A 47-year-old woman had a history of atrial flutter and underwent radiofrequency ablation with an 8-mm catheter. The initial ablation line consisted of 17 radiofrequency applications (maximum power 70 watts and maximum temperature 70 degrees), most for 60 seconds. The line of block extended down from the cavotricuspid region to the inferior vena cava (IVC). A procedural follow-up study showed unidirectional block with a questionable area near the IVC. An additional 20 RFA applications were applied superior to the previous line but the applications were also extended into the IVC. A repeat follow-up study showed successful RFA of her atrial flutter and bidirectional block across the cavotricuspid isthmus at baseline and following an isoproterenol challenge.

Six weeks following her cardiac RFA she presented to another hospital complaining of chest pain. Troponin levels, a cardiac stress test and an echocardiogram were described as normal and she was discharged. Five days later she had a witnessed collapse at home. Emergency medical services responded and found her asystolic. Further resuscitative efforts were unsuccessful and she was pronounced dead in the emergency department.

At autopsy, she had a cavotricuspid isthmus disruption with a 450 mL hemopericardium. Microscopically, the site of disruption had homogenization, necrosis, fibrosis and extravasated blood. Associated with the fibrosis and necrosis were chronic inflammatory cells and granulation tissue. Elastic fibers were disrupted near the site of rupture and hemosiderin laden macrophages were present.

The authors were unable to find a previous report of delayed cavotricuspid rupture and hemopericardium following cardiac radiofrequency ablation; however, in experimental animal studies damage to the tricuspid valve and IVC occurred most frequently with high energy pulses and 8-mm catheters.

Radiofrequency Ablation, Cardiac Dysrhythmias, Complications

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