



Pathology Biology Section - 2012

G30 Foreign Emboli to Multiple Organs Following Catheter Ablation

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After this presentation, attendees will be aware of an unusual complication to the common procedure of cardiac ablation involving trans-atrial catheterization. Attendees will understand the possible clinical presentation and the likely histopathologic findings seen in patients whose intravascular procedures are complicated by embolization of foreign material from the devices used in these procedures. Attendees will also understand how to investigate and report a possible medical device safety problem.

This presentation will impact the forensic science community by alerting the autopsy pathologist to the possibility that an intravascular procedure may directly contribute to death. This presentation will inform the pathologist as to the likely gross and microscopic findings in cases of foreign material emboli from catheter devices. Finally, this presentation will highlight the role of the forensic pathologist in product safety surveillance.

Catheter ablation is indicated as therapy for patients with symptomatic supraventricular tachycardia, symptomatic ventricular tachycardia, and atrial fibrillation. In patients with atrial fibrillation, catheter ablation is indicated for those who do not tolerate anti-arrhythmic drugs, in whom pharmacologic therapy is ineffective or who have lifestyle-impairing atrial fibrillation. The simplest ablation therapy for atrial fibrillation is radiofrequency ablation of the atrioventricular nodal junction only. However, it is common to ablate more extensive areas of cardiac tissue, including the muscular connections between the pulmonary veins and the left atrium. These procedures may employ a technique in which the cardiac catheter crosses the atrial septum. Embolization of foreign material as a result of catheterization procedures is an uncommon complication.

This case study is a 63-year-old male who developed *Streptococcus anginosus* sepsis and suffered a progressive frontoparietal stroke complicated by extensive pneumocephalus within three months of his catheter ablation procedure for atrial fibrillation. Clinically, he was suspected to have septic emboli from heart valve vegetations. However, at autopsy, his heart valves appeared normal. His brain had bilateral infarctions with subfalcine herniation. On microscopic examination, there were foreign material emboli in his lungs, kidneys, heart, liver, brain, and esophagus. The foreign material was basophilic, non-polarizable, PAS positive, trichrome negative, and had no defined shape. The foreign material in his cerebral vasculature was associated with areas of infarction as well as foreign body giant cells with a granulomatous reaction. In other organs, the foreign material was associated with chronic inflammation and foreign body giant cells, but not necrosis. The histologic appearance of this foreign material is similar to that described in other literature reports of foreign material emboli from intravascular procedures. This case appears to be unique among reported cases of foreign material emboli from intravascular procedures in that this previously healthy patient had a single intravascular procedure that produced foreign material emboli to every organ examined at autopsy and contributed directly to his demise.

The autopsy findings and their implications were discussed with the cardiologist who performed the procedure and with the manufacturer of the device. The cardiologist was unaware of this complication in other cases. The manufacturer of the catheter used in this patient's procedure was unaware of reports of similar complications from this device. This case was also reported to the Food and Drug Administration as a medical device problem.

This case report details an unusual complication of intravascular procedures and highlights the importance of the forensic pathologist in surveillance of potential product danger to the community.

Foreign Material Emboli, Catheter Ablation, Cardiac