Shotgun Workup: A Case of Ventricular Tachycardia from a Shotgun Pellet 20 Years Prior

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Introduction: Ventricular tachycardia (VT) involving an extracardiac foreign body is extremely rare and there is limited data regarding treatment.

Methods: N/A

Result: A 59-year-old male with history of hypertension and two liver transplants on tacrolimus presented to the hospital with lightheadedness associated with palpitations and shortness of breath. He denied any chest pain or loss of consciousness. Telemetry and initial ECG (figure A) showed frequent episodes of nonsustained VT (NSVT) 5-6 beats, bigeminy, and premature ventricular contractions (PVCs). He had an acute kidney injury and hyperkalemia with an initial potassium of 6.5 mmol/L. Amiodarone was avoided due to his history of liver transplant and ongoing tacrolimus treatment. He was given IV and oral metoprolol with no major response. Despite improvement in potassium and renal function, the ectopy continued. An echocardiogram showed a low normal ejection fraction of 50-54% with no other significant findings. Due to recurrent NSVT a left heart catheterization was performed showing nonobstructive coronary artery disease and a shotgun pellet in the basal right ventricular area (figure B), also seen on CXR (figure C). Upon further questioning the patient reported being shot 20 years prior in a hunting accident. An EP study was performed (figure D-F) showing no inducible sustained VT. Unipolar mapping showed a QS pattern in the area just superior to the shotgun pellet, and intracardiac electrograms demonstrated diastolic potentials 31ms before surface PVC. It was concluded that the origin of the ectopy was 2mm superior to the shotgun bullet, likely from scar tissue surrounding the pellet. Cardiovascular surgery recommended no surgical extraction given the high complication risk. After a long discussion with the patient regarding cryoablation of the ectopic focus versus a more conservative approach with medical therapy, the patient opted for medical therapy. With increased metoprolol and verapamil his ectopy and symptoms improved. A repeat echocardiogram showed that with the improvement in ectopy his ejection fraction increased to 60-64.

Conclusion: There is minimal data regarding VT originating from scar tissue surrounding a cardiac bullet fragment. Cardiac foreign bodies can cause many complications including acute problems often surrounding the penetrating injury, embolism, arrhythmia, and infection. In regards to treatment, we initially followed what one case series suggested for symptomatic intracardiac foreign bodies and consulted surgery. The benefits of surgery, however, did not outweigh the possible harm in our patient who had not yet gone through less invasive alternatives and whose ectopic focus was caused by tissue surrounding an extracardiac bullet. There was also minimal data on ablating an ectopic focus caused by a foreign body. In this specific case the patient was successfully treated with medical therapy.