G43 Sudden Cardiac Death in an Athlete: A Case Report

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After attending this presentation, attendees will learn of a case showing unusual cardiac cause of sudden death in an athlete, including arrhythmogenic right ventricular cardiomyopathy (ARVC), and coronary artery disease (CAD) after chronic cocaine use.

This presentation will impact the forensic science community by revealing various histological cardiac lesions observed after a sudden death in a retired doping athlete.

Cardiovascular diseases represent the most frequent causes of sudden death in athletes, including hypertrophic cardiomyopathy, anomalous coronary artery anatomy, arrhythmogenic right ventricular cardiomyopathy, and aortic aneurysm. Disorder of cardiac rhythm and stenosis of the coronary arteries are physiopathological mechanisms that can explain cardiac arrest.

This case involved a 36-year-old man who was a two-time world champion while he was cocaine-dependant. He participated in triathlons after his career as a recreational sport without taking cocaine. He had neither medical history nor cardiovascular risk factor except tobacco. He died suddenly during sleep. A complete postmortem examination was performed. The descendant was 172 cm tall and weighed 77 kg (BMI 26). The autopsy showed several cardiac lesions:

- A cardiomegaly (520g) with a symmetric left ventricular hypertrophy usually expected in elite athlete; there was no dilatation and no architectural disorganization.
- An epicardial coronary stenosis of the left anterior descending artery and the first diagonal branch (80-90%) with recent thrombosis on the surface of an atheromatous plaque; there is no acute myocardial infarction.
- Several areas of fibrosis in left ventricular, resulting from an
- Limited right ventricular hypertrophy with replacement of the myocardium by fibrofatty tissue in restricted expanse, which is a feature of ARVC.

Those findings allow the conclusion that rhythm disorder caused death. The association of ARVC and CAD in athlete is really unusual.

Arrhythmogenic right ventricular cardiomyopathy is a myocardial disease characterized by fibrofatty replacement and ventricular arrhythmias. ARVC is a hereditary disease with autosomal dominant transmission in at least 50% of cases. It occurs specifically in athletes and affects predominantly men. The prevalence in the general population varies between 1 in 1,000 to 1 in 5,000. Diagnosis rests on criteria including signs such as severe segmental dilatation of the right ventricle and fibrofatty replacement of myocardium on endomyocardial biopsy for example. This disease leads to sudden death by ventricular arrhythmias.

Atherosclerotic disease is primarily responsible for sudden death in athletes older than 35 years. Traditional markers of CAD are widely known, like hypertension, obesity, smoking, diabetes, and lipid abnormalities. Cardiac effects of cocaine chronic abuse also exist. It is associated with CAD by multiple pathogenic mechanisms: elevation in blood pressure, acceleration of atherosclerosis, increase of thrombosis risk by activating platelets, and vasoconstriction.

To conclude, this case report brings to light unusual arrhythmogenic factor leading to sudden death in athlete. **Sudden Death, Athlete, Arrhythmogenic Right Ventricular Cardiomyopathy**

 ** Presenting Author*