G16 Sudden Death in a Healthy 37-Year-Old Man While Driving: Spontaneous Dissection of the Posterior Segment of the Right Coronary Artery

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After attending this presentation, attendees will recognize spontaneous coronary artery dissection as a cause of sudden death, and as a discrimination between auto accident injury and natural cause of death. Review of the epidemiologic, gross, and histologic features and characteristics of this rare disorder will be presented to forensic pathologists

This presentation will impact the forensic community and/or humanity by increasing the awareness of the existence, characteristics, gross presentation, and histology of a rare natural disorder which frequently presents with sudden death, and which may complicate deaths in motor vehicle accidents.

A 37-year-old man with no history of heart disease, including no family history, was driving down a state highway when his car ran off the left side of the road, struck a sign, veered across the median across the oncoming traffic lane, and struck a utility pole. There was no attempt to brake, according to witnesses, and no skid marks. No other cars were involved in the accident. The victim was wearing his seat belt and shoulder belt, and the airbag deployed. A witness said the victim showed signs of life after the car came to rest. Emergency medical personnel who reached the scene noted there was no visible injury, but the victim was unresponsive and asystolic, and they believed him dead. Attempted cardiopulmonary resuscitation at the scene and in a local emergency room was unavailing.

At autopsy, the victim measured 68" tall and weighed 198, with a muscular body habitus with no evidence of obesity. External signs of injury were limited to several small bruises on the left side of the shoulder at the base of the neck, consistent with a shoulder harness. There were no xanthomata of the eyelids or elbows. The heart weighed 375 grams, less than five percent of estimated lean body weight; there were no signs of hypertrophy. The renal cortices were smooth. The coronary arteries had normal takeoffs, without atherosclerosis other than proximal fatty streaks. There were no coronary anomalies or previous infarcts. There were no significant internal injuries.

On sectioning of the ventricles, a "red dot" was noted in the epicardial fat over the posterior septum. Examination with a hand-held magnifying glass confirmed hemorrhage both inside and around the posterior septal segment of the right coronary artery. A delicate layer of coronary wall could be seen creating an S-shape between foci of hemorrhage.

On histology, the coronary artery had dissected through the outer plane, and a mixed inflammatory infiltrate including eosinophils surrounded the adventitia, and infiltrated the wall. No other area of the heart or coronaries showed eosinophils. There were no foci of lymphocytic myocarditis. No myocardial scarring, myocyte hypertrophy, or small vessel disease was present.

Dissection of the coronary arteries as a spontaneous event has been well reported in the literature, with an undetermined but possibly autoimmune etiology. More than two thirds of patients present at autopsy; the remaining third often recover with stenting or thrombolysis. Coronary artery dissection accounts for approximately 0.5% of sudden deaths in patients 30-40 years old. The typical victim is female, of childbearing age, frequently in her thirties, occasionally postpartum. The victims do not have a history of hypertension (or hypertension is present as an unrelated factor). Over 90% of cases that come to autopsy involve the left anterior descending coronary artery. Under the microscope, the dissection plane is in the outer media, unlike the dissection of atherosclerotic arteries. There is a striking infiltrate of eosinophils, lymphocytes, neutrophils, and macrophages in the adventitia. Some believe that the inflammatory infiltrate is secondary to the dissection, and not a vasculitis. There is no time of day, drug, or activity, which is correlated with initiation of the dissection.

Spontaneous or eosinophil-associated dissection of the coronary arteries in males is rare. Men comprise about 15% of the victims of this unusual disorder. The posterior segment of the right coronary artery is the most frequently reported site in men. Researchers were unable to find information that would answer the family's questions as to risks for other family members. The etiology and genetics of spontaneous coronary dissection are unknown. The case is discussed in conjunction with a review of the literature and the sparse information that is available on this rare disorder.

Spontaneous Coronary Artery Dissection, Males, Motor Vehicle Accident

 ** Presenting Author*