



Pathology & Biology Section – 2008

G85 Dysplasia of the Atrioventricular Nodal Artery: A Case Report and Review of the Literature

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After reviewing this presentation, attendees will understand the pathophysiology and epidemiology of conduction system arterial dysplasia, a rarely reported condition. Autopsy findings and the correlation between histopathologic abnormalities and sudden death will be emphasized via a case presentation and a review of the literature on this topic.

It is important that the forensic community be aware of this process, its characteristic histopathology, the distribution and clinical consequences of similar lesions throughout the body, and its implications as a cause of sudden death. Pathologic processes involving the conduction system are often considered in the investigation of otherwise healthy persons, and this presentation will impact the forensic science community by presenting evidence for the systematic examination of conduction system histology.

A case of the investigation of the sudden death of a previously healthy 15-year-old male will be presented. The patient had a history of being overweight (BMI 28.4), mild well-controlled asthma, and Attention Deficit and Hyperactivity Disorder treated in the past with stimulants. Examination revealed an essentially negative autopsy, a negative skeletal survey by radiography, and normal histopathology of the usual microscopic sections taken at autopsy. Postmortem toxicology was significant for the presence of a moderate amount of caffeine. Viral and bacterial cultures grew a likely postmortem contaminant only, and vitreous chemistries were normal. Further examination of the conduction system revealed significant dysplasia of the atrioventricular nodal artery, characterized by irregular fibrointimal thickening of the vessel wall with marked disruption of the elastic lamina, highlighted by special stains.

Dysplasia of the atrioventricular nodal artery is a rare entity, described only in small case reports and series. The morphologic changes are the same as those found with fibromuscular dysplasia, which is most commonly seen in the renal and internal carotid arteries but has been reported in numerous arterial beds and may even be a generalized condition. Fibromuscular dysplasia is a nonatherosclerotic, noninflammatory disease of the arterial wall, the exact cause of which is unknown. The lesions may predominantly alter the intima, media, or the adventitia, and the sequelae are dependent upon the degree of vascular wall thickening or destruction and the location of the affected vessels.

Within the forensic literature, there are scattered case reports of dysplasia within the vasculature supplying the conduction system, but the majority of the literature linking fibromuscular dysplasia to a cause of death focuses on the disease process within the small coronary arteries. In fact, some controversy exists as to the presence of apparent dysplasia within the nodal arteries in control subjects dying of other causes and whether the use of special stains can highlight specific alterations of the vessel wall that may lead to an increased association with sudden death.

An example of atrioventricular nodal dysplasia is the cause of sudden death in a relatively healthy adolescent. It is important that the forensic community be aware of this process, its characteristic histopathology, the distribution and clinical consequences of similar lesions throughout the body, and its implications as a cause of sudden death. Pathologic processes involving the conduction system are often considered in the investigation of otherwise healthy persons, and this presentation will present evidence for the systematic examination of conduction system histology.

Atrioventricular Node, Dysplasia, Sudden Death