H4 When the Walls Close In: Chronic Allograft Vasculopathy on Autopsy of an Orthotopic Heart Transplant Patient

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The goal of this presentation is to illustrate a rare form of vascular occlusive changes that can be seen on autopsy and can lead to misdiagnosis.

This presentation will impact the forensic science community by demonstrating the chronic changes of vascular structures in transplant patients and how these changes can lead to ischemic damage of the transplanted organ.

Introduction: Heart transplantation procedures have been steadily increasing in the United States. The Organ Procurement and Transplantation Network reported 3,191 transplants in 2016 in America and 67,301 in total since 1988. Advancements in post-surgical therapies have decreased acute rejections and increased the one-year survival rates. Unfortunately, the long-term survival rates have not followed, as chronic, progressive arteriopathies compromise the blood flow to the transplanted heart and lead to ischemic injuries.

Materials and Methods: This case involved a 46-year-old Caucasian male who had undergone orthotopic heart transplant in 2005 and had multiple episodes of rejection due to medication non-compliance. The patient arrived at the hospital for his scheduled plasmapheresis session for presumed antibody mediated rejection, where he complained of numbness, lightheadedness, and dyspnea. A right heart catheterization revealed hemodynamic signs suggestive of ongoing rejection despite recent aggressive treatment. The patient was admitted and was initially responding favorably, but was found unresponsive on day eight. Despite multiple lifesaving efforts, the patient unfortunately expired.

Results: Postmortem examination revealed acute myocardial infarction involving the septum and the posterior and lateral left ventricular walls. The coronary arteries exhibited varying degrees of chronic allograft vasculopathy with intimal arteritis.[1] The vessel walls revealed concentric tunica intimal thickening, resulting in luminal narrowing of 25%-50%. The epicardial and intramural arterioles showed lymphocytes in an infiltrative and perivascular pattern. Obliterative transplant arteriopathy could be appreciated in the intramural arterioles, with up to 90% luminal narrowing.

Discussion: Chronic allograft vasculopathy is diagnosed in one-third of heart transplant patients five years after the procedure and in half of these patients by ten years.[2] The most widely accepted etiology is immune-based, wherein the recipient's immune system recognizes the foreign tissue, releases a cytokine cascade, resulting in growth factor expression and eventually smooth muscle proliferation in the artery walls.[3] The incidence has remained stable despite advancements in immunosuppressive treatments.[2] With an increase in heart transplant patients surviving beyond five years, recognition of chronic allograft vasculopathy will be needed to avoid misdiagnosis from similar diseases to such as: atherosclerotic coronary artery disease, acute transplant rejection, and autoimmune and/or infectious myocarditis.

Reference(s):

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Chronic Allograft Vasculopathy, Intimal Arteritis, Obliterative Arteriopathy

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