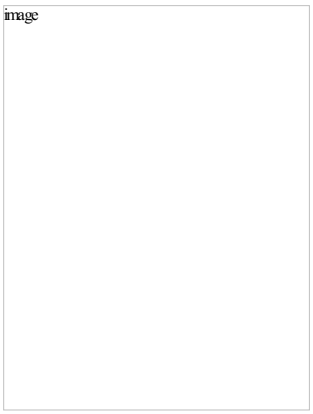

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# Elevated Serum Vascular Endothelial Growth Factor and Development of Cardiac Allograft Vasculopathy in Children

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## Introduction

Cardiac allograft vasculopathy (CAV) is a leading cause of re-transplantation and death in pediatric heart transplant recipients[1]. CAV is a complex process involving alloimmune response, chronic inflammation, and smooth muscle cell proliferation, exemplifying cross talk between cytokines and growth factors[2]. The diagnosis of CAV is challenging: early in the development of CAV, patients are almost universally asymptomatic. Thus, despite the invasive nature, coronary angiography is performed on a routine schedule for CAV surveillance. Nevertheless, coronary angiography is not a highly sensitive method for detecting early CAV[3] since pathologic vascular remodeling is present before the diameter of the coronary artery lumen visibly decreases[4]. The use of intravascular ultrasound (IVUS) has evolved as a valuable adjunct to coronary angiography[5], however cardiac catheterization is still required and its use is limited by expertise and patient size in the pediatric population. Once CAV is diagnosed, modification of immunosuppression to include proliferation signal inhibitors may slow the progression of CAV[6], but no medical treatments are currently proven to reverse CAV. While the diagnosis of moderate or severe CAV portends a significantly higher risk of graft loss[7], outcomes of pediatric patients with angiographically mild CAV are variable: graft survival is similar to those without CAV (stable mild CAV) but in a subset of patients, mild CAV can be rapidly progressive, necessitating listing for re-transplantation[7-9]. Elevated