Case Report

Saphenous Vein Graft Aneurysms Demonstrated by Computed Tomography

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Abstract: A case of aneurysms of saphenous vein coronary artery bypass (CAB) grafts is presented with CT and echocardiography findings. Aneurysms of the bypass graft are rare complications of CAB surgery but many occur due to atherosclerosis, infection, surgical technique, or vasculitis. Index Terms: Arteries, coronary bypass graft—Pseudoaneurysm—Computed tomography.

Late complications of coronary artery bypass (CAB) surgery include progression of atherosclerosis at the anastomotic site, anastomotic strictures, intercoronary artery steal syndrome, coronary arteriovenous fistulas, proximal dissections of the aorta, and pseudoaneurysms at the proximal and distal anastomotic sites (1-5). True saphenous vein graft aneurysms are exceedingly rare but have been reported secondary to progression of atherosclerosis or mycotic infection (6-8). Computed tomography demonstrates aneurysms of the mediastinal great vessels with high accuracy and has been used to evaluate patency of CAB grafts (9). We report CT findings of fusiform aneurysms in aorto-coronary saphenous vein grafts in a patient with a nonspecific vasculitis.

CASE REPORTS

A 23-year-old woman first presented at 12 years of age with hematuria and rising blood urea nitrogen and serum creatinine levels. A renal biopsy revealed a vasculitis of unknown etiology with marked parenchymal scarring. The patient’s renal function improved on steroid therapy. At age 18, the patient developed unremitting angina requiring three vessel CAB grafting with saphenous veins. Histological examination of the coronary arteries demonstrated nonspecific vasculitis as did a repeat percutaneous renal biopsy at the age of 23, despite high dose prednisone and azathioprine therapy. At the time of the renal biopsy, routine chest radiography revealed a large, round mass near the left cardiac border thought to be a ventricular aneurysm (Fig. 1). Computed tomography revealed two large fusiform structures of low attenuation in the paracardiac space (Fig. 2). Because of the patient’s impaired renal function and history of contrast allergy even while taking prednisone, no intravenous contrast medium was given. The differential diagnosis of these lesions included pericardial cysts, bronchogenic or mediastinal cysts, low-density nodes, or aneurysms of the CAB grafts. Echocardiography confirmed the vascular nature of these structures and showed that they lay in the expected positions for saphenous graft aneurysms (Fig. 3). Several months later the patient died suddenly at home. At autopsy a 3 mm rent was discovered in one of the aneurysmally dilated saphenous vein grafts with extensive blood in the mediastinum (Fig. 4). Histologically, no active vasculitis was seen but multiple layers of thrombi of varying ages were seen at the site of the tear. Chronic bleeding from the graft presumably caused the “pseudoaneurysmal” dilation seen on serial chest radiography.

DISCUSSION

Anastomotic aneurysms have been reported in up to 2-3% of all types of grafts (4). They may occur at any time after surgery, with a mean onset of 5.9 years (4). Repair of the aneurysms is very difficult due to the extensive perivascular fibrosis. The aneurysms most commonly occur at the proximal anastomotic site (4,5). Because these focal dilatations are not endothelial-lined but represent local distention with hematoma, they are more...
aptly labeled pseudoaneurysms. Pseudoaneurysm formation is associated with a disruption of anastomotic sutures, healing complications, defects in the fabric of prosthetic grafts, intrinsic weaknesses of the proximal arteries, progression of native artery atherosclerosis, and vein graft intimal deficiency (3,4).

In 1975, Riahi et al. reported the first case of a true aneurysm of a CAB vein graft distal to the aortic anastomosis occurring 2½ years after surgery (6). In 1978 Pintar reported two cases of focal venous CAB aneurysms consisting of fusiform symmetrical dilatation of the saphenous vein grafts distal to the anastomotic sites (7). Histologic examination confirmed atherosclerosis as the etiology of the aneurysms. Similarly, Bramlet et al. reported a case of a dissecting hemorrhagic saphenous vein graft aneurysm (10). He postulated that true aneurysms of vein grafts may be induced by vein graft necrosis, hypertension, trauma at implantation sites, or progressive atherosclerosis (1,7,10). Benchimol et al. wrote that dilatations may occur at a weak area between the valves of the saphenous veins, where the circular smooth muscle gives way to longitudinal smooth muscle (11).

Mycotic CAB aneurysms, usually a form fruste
of proximal anastomotic pseudoaneurysms, occur as a complication of infective mediastinitis after sternotomy (8). Spread of infection usually causes a pericarditis as well.

An expanding paracardiac mass in a patient with previous CAB surgery should suggest the possibility of hematoma or rupture at the anastamotic site, no matter how far removed from the original time of surgery. Contrast enhanced CT or magnetic resonance imaging should be accurate modalities to evaluate this unusual complication.

REFERENCES