Interesting Images: Multiple Coronary Artery Aneurysms

Abstract
We present the case of a 65-year-old male who presented with stable angina and dyspnea on exertion. His initial workup yielded a positive treadmill stress test for reversible apical ischemia, and transthoracic echocardiogram demonstrated impaired systolic function. Cardiac catheterization was then performed, revealing severe atherosclerotic disease including multiple coronary artery aneurysms. As a result, the patient was advised to and subsequently underwent a coronary artery bypass graft. This case highlights the presence of multiple coronary artery aneurysms and the ability to appreciate these pathologic findings on multiple imaging modalities, including coronary angiogram, transesophageal echocardiography, and direct visualization through the surgical field.

Keywords: Coronary artery aneurysms, coronary artery bypass graft surgery, coronary ectasias, transesophageal echocardiography

Introduction
Coronary artery aneurysms, which can also be referred to as ectasias, are typically defined as a dilatation in the diameter of a coronary artery segment to more than 1.5 fold the normal size. The earliest description of this type of pathology was by Morgagni in 1761, followed with one of the first case series, which comprised 21 patients, that was reported in 1929. The current knowledge on the epidemiology and natural history of coronary aneurysms derives from several large angiographic series, where patients have been divided into three groups defined by the presence of aneurysms alone, aneurysms and atherosclerotic coronary artery disease (ACAD), and ACAD alone.

Case Report
A 65-year-old obese male with a medical history of hypertension, diabetes mellitus Type II, and a twenty pack-year smoking history presented with stable angina and dyspnea on exertion. Treadmill myocardial perfusion scintigraphy and transthoracic echocardiogram demonstrated reversible apical ischemia and impaired systolic function, respectively. Subsequent cardiac catheterization revealed severe atherosclerotic disease with multiple coronary artery aneurysms. The left anterior descending artery was occluded 90% proximally and 80% distally. The first diagonal branch had a large aneurysm proximal to an area of nearly 100% occlusion. At the ostium of the circumflex coronary artery from the left main coronary artery, there was another large aneurysm. The right coronary artery demonstrated a severely dilated aneurysm proximally, followed by a 90% occlusive lesion, and another large aneurysmal dilatation was noted distally [Figure 1]. The patient was advised to undergo coronary artery bypass graft. Three months later, he consented to the surgery.

The patient underwent a standard induction with fentanyl, 2% lidocaine, propofol, and succinylcholine. His airway was secured using direct laryngoscopy and an 8.0 cm single-lumen endotracheal tube. Under general anesthesia, the patient underwent successful five-vessel coronary artery bypass graft using the left internal mammary artery and the saphenous vein. In addition to the standard American Society of Anesthesiology monitors, he was additionally monitored with a left radial arterial line, a Swan-Ganz catheter, and transesophageal echocardiography (TEE). The TEE demonstrated a coronary artery aneurysm of the circumflex artery in the mid-esophageal 4-chamber view [Figure 2]. During the procedure, the coronary artery aneurysms were visible from the surgical field [Figure 3]. The surgery finished
Discussion

In adults, coronary artery aneurysms are defined as focal dilatations >1.5 times the diameter of the patient’s largest coronary artery. When the enlarged segment exceeds 50% of the vessel length, it is termed coronary ectasia.[3] Coronary artery aneurysms and ectasias are rare. A study of nearly 5000 coronary arteriograms demonstrated an incidence of 1.4%.[4] Other studies have reported a prevalence as high as 4.9%.[5] The possible etiologic factors include Kawasaki disease, congenital malformations, infection, and iatrogenic trauma; however, the most common cause of coronary aneurysms in adults is ACAD, which accounts for up to 50% of the cases.[6] Severe coronary artery disease is more commonly associated with discrete aneurysms than with ectasia.[7] In addition, aneurysms due to atherosclerosis are often multiple, affecting two or more vessels. The right coronary artery is involved in 40%–61% of cases, the left anterior descending in 15%–32%, the left circumflex artery in 15%–23%, and the left main coronary artery is involved in only 0.1%–3.5% of cases.[3] Treatment and prognosis vary depending on several factors including etiology of the disease and underlying atherosclerotic disease.[8]

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Conflicts of interest

There are no conflicts of interest.

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