

Giant coronary artery aneurysms and myocardial infarction: aetiology and management

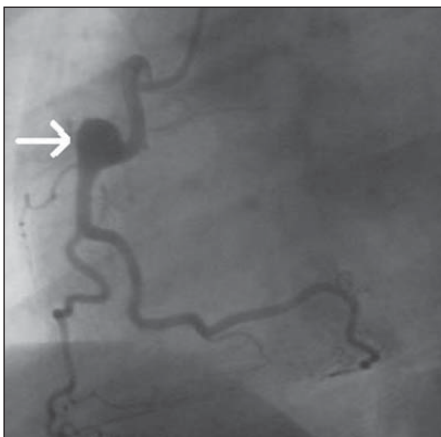
Introduction

Coronary artery aneurysms are rare but have been associated with atherosclerosis, Kawasaki disease, trauma and connective tissue disorders. At present, no formal guidelines exist regarding the management of patients with coronary aneurysms. This article describes a case and discusses management.

Discussion

Coronary artery aneurysms are coronary artery dilatations, either fusiform or saccular, which exceed the patient's largest coronary vessel by 1.5 times. Giant coronary aneurysms have a diameter greater than or equal to 8 mm. Angiography and autopsy studies report an incidence which ranges from 1.5–5% in Caucasians (Syed and Lesch, 1997).

Figure 1. Coronary angiogram showing a dominant right coronary artery with a dilated saccular aneurysm (9 mm x 10 mm) (white arrow) in the mid vessel.



Complications include thrombosis and rupture, with or without associated coronary stenosis. Reduced blood flow within aneurysms is thought to act as a precipitant for thrombus formation (Wang et al, 1999).

Several aetiologies are implicated in the formation of coronary artery aneurysms (Table 1), atherosclerosis being the most common (Swaye et al, 1983). Kawasaki disease is particularly associated with coronary artery aneurysm formation, and is the primary cause of acquired paediatric heart disease in Japan and the United States (Rowley and Shulman, 1999). Kawasaki

Figure 2. Coronary angiogram showing the left anterior descending artery to be ectatic with a fusiform aneurysm (10 mm x 20 mm) in the proximal third (white arrow), which extends into the first diagonal branch.



disease is a systemic vasculitis, predominantly affecting small and medium-sized muscular arteries. It affects children younger than 5 years and presents with prolonged fever, rash, mucocutaneous involvement, lymphadenopathy and conjunctivitis. Cardiac abnormalities are noted in 30% of cases during the acute stage of the illness and include myocarditis, congestive heart failure, pericardial effusions, arrhythmias and mitral regurgitation (Demopoulos et al, 1997).

Aneurysms are usually detected 1–4 weeks after the onset of fever and new lesions are rare after 6 weeks. Forty per cent of infarctions occur within the first 3 months of illness, and the majority of the remainder occur within the first year (Rowley and Shulman, 1999). Factors favouring regression include smaller size, less severe coronary lesions, female sex, and treatment with salicylates and immunoglobulins.

Angiographic follow up of 594 patients with Kawasaki disease revealed long-term sequelae including persistence of giant coronary aneurysms and subsequent development of stenotic lesions (Kato et al, 1996). A long-term follow up of 562 patients undergoing serial angiography revealed that new or expanding aneurysms were detected up to 19 years after diagnosis of Kawasaki disease (Tsuda et al, 2005). The majority of aneurysms occurred in vessels in which previous aneurysms had regressed and all new aneurysms were associated with localized stenosis.

Case Report

A 28-year-old man developed central chest pain while walking at altitude in South America. An electrocardiogram showed ST segment elevation anteriorly, suggestive of acute myocardial infarction. An echocardiogram demonstrated anteroseptal hypokinesia. Biochemistry confirmed elevated cardiac enzymes.

Coronary angiography revealed giant aneurysms in both right (Figure 1) and left (Figure 2) coronary arteries. Occlusive thrombus in the left anterior descending artery was treated by primary angioplasty.

The patient had no known conventional risk factors or family history for coronary artery disease. Treatment with aspirin, clopidogrel and warfarin was commenced to prevent further coronary thrombosis. Post angioplasty he was repatriated to the UK and remains well on planned long-term therapy with aspirin and warfarin.

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Table 1. Causes of coronary aneurysms and relative incidence

Causes	Percentage of cases
Atherosclerosis	50–80
Congenital	20–30
Inflammatory (Kawasaki disease, polyarteritis nodosa, systemic lupus erythematosus, Takayasu arteritis, syphilis, Behçet's disease)	10–20
Traumatic (dissection, coronary angioplasty)	<1%
Connective tissue disorders (Marfan syndrome, Ehlers–Danlos syndrome)	<1%
Infective/mycotic (Quartan malaria)	<1%
Others (cerebrotendinous xanthomatosis, neurofibromatosis)	<1%

Management involves treatment of the underlying cause and prevention of complications associated with coronary artery aneurysms. In the absence of obstructive coronary artery disease, antiplatelet and anticoagulant therapy with aspirin and warfarin has been successful in preventing myocardial infarction. Intracoronary thrombolytic therapy has been effective in patients with giant coronary aneurysms presenting with myocardial infarction, angina and massive thrombus formation. Symptomatic patients with significant coronary stenosis, giant coronary aneurysms or multi-vessel involvement are usually

treated with coronary artery bypass surgery. Endovascular techniques including coil embolization, autologous vein-covered or PTFE (polytetrafluoroethylene) covered stent grafts have been proposed as alternatives to surgery. Covered stent grafts provide aneurysm obliteration and preserve lumen patency, although the restenosis rate is unknown.

This patient demonstrated giant coronary artery aneurysms although the aetiology remains unclear. There was no evidence of atherosclerosis or obstructive coronary artery disease on angiography and no features in the history, examination or labora-

tory investigations suggested an inflammatory, infective or connective tissue disorder. In addition, there was no childhood history suggestive of Kawasaki disease and angiography did not demonstrate calcification or vessel wall thickening associated with the lesions. Review of a large personal series of patients with Kawasaki disease by one of the authors (ET) suggests that the features in this case are atypical for this disease. This patient is currently asymptomatic and continues on an anticoagulation regimen of aspirin and warfarin. **BJHM**

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IMAGES IN MEDICINE

A snake bite

II 34-year-old woman complained of a sensation of a foreign body in a thumb wound, following a boa constrictor bite 3 days earlier. Omitting to wash her hands between feeding the snake defrosted rats resulted in her hand being mistaken for food. Several small puncture wounds (*Figure 1*) overlay something of hard consistency beneath the skin, but there was no evidence of infection. An X-ray

revealed several tiny teeth remaining in the left thumb (*Figure 2*). The patient declined removal of the teeth, but was warned to watch out for development of later mycobacterial infection (Hofer et al, 1993). Previous evidence suggests prophylactic antibiotics for non-venomous snakes are not indicated (Weed, 1993) unless necrosis is present or

anticipated (Blaylock, 1999). **BJHM**

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Figure 1. Photograph of the wound.



Figure 2. A radiograph showing the snake teeth (arrow) in the wound.

