Coronary aneurysm complicated by acute myocardial infarction

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Abstract

The case of a 55 years old, hypertensive, obese female is presented, who came to the emergency department with inferoposterior ST segment elevation myocardial infarction (STEMI) with right ventricular infarction. After thrombolytic therapy, she reperfused but had anginal symptoms on minimal activity. The patient underwent coronary angiogram which showed aneurysmal right coronary artery (RCA) with 60% stenosis and thrombus in mid portion and distal bifurcation of RCA with TIMI III distal blood flow. Left main coronary artery was normal. Left anterior descending (LAD) and Left circumflex (LCX) arteries were also aneurysmal and non obstructive. The patient was started on intravenous heparin and warfarin in view of aneurysmal coronary arteries and large thrombus burden. The patient was discharged home in one week and is doing well at follow up.

Keywords: STEMI, Intravenous heparin, Warfarin, Thrombus.

Introduction

Coronary artery aneurysm is defined as a localized coronary dilatation exceeding the diameter of adjacent normal segments by 50%.[1] Coronary aneurysms usually remain silent however they can produce symptoms including angina due to impaired coronary flow, myocardial infarction resulting either from thrombus formation or its embolization, sudden rupture or congestive cardiac failure due to formation of coronary fistulas. Management consists of long term anticoagulation, antiplatelet therapy and surgery in case of recurrent symptoms. We are reporting a case of coronary aneurysm complicated by thrombus formation leading to myocardial infarction.

Case Report

A 65 years old , hypertensive, dyslipidaemic and obese female had six months history of recurrent anginal pain and exertional dyspnoea and presented in emergency department with one hour history of ongoing chest pain. Electrocardiogram in the emergency department was consistent with acute inferioroposterior ST elevation myocardial infarction (STEMI) with right ventricular infarction. She was clinically and electrocardiographically reperfused after thrombolytic therapy.

During hospitalization, the patient developed post

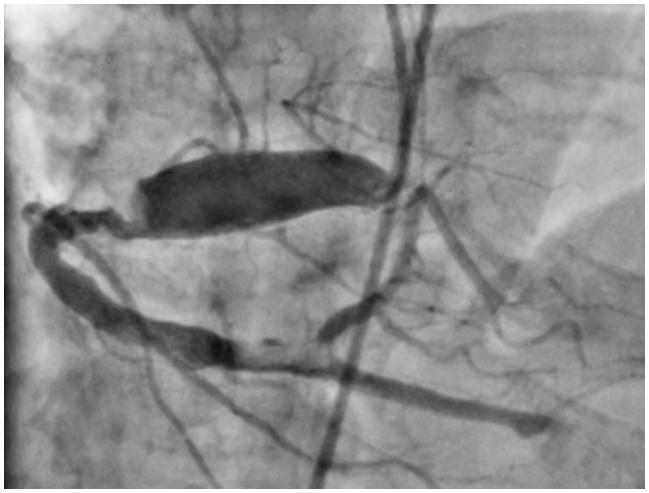

Figure-1: LAO cranial view showing aneurysmal right coronary artery with filling defect (thrombus) in mid RCA and at bifurcation.

Figure-2: RAO Caudal view showing aneurismal left anterior descending and left circumflex artery.

myocardial infarction angina on minimal activity and was subjected to coronary angiogram which showed: aneurysmal proximal right coronary artery (RCA) 15mm (1.5cm) in diameter with 60% stenosis and large filling defect (thrombus) in mid RCA. A large thrombus was also noted at the bifurcation of RCA (Figure-1).

Left main stem was normal, Left anterior descending (LAD) and Left circumflex (LCX) arteries were also aneurysmal and indicated non obstructive coronary artery disease. LAD aneurysm was 10mm (1cm) in diameter. (Figure-2). Left ventricular systolic function was preserved on left ventriculogram.

In view of the patients coronary anatomy and presence of aneurysmal vessels with evidence of thrombus which was the likely cause for her inferioposteror myocardial infarction, she was started on heparin along with warfarin and antiplatelet therapy. She was discharged on fifth day of admission in a stable condition on warfarin and aspirin. Patient is doing well on follow up.

Discussion

An aneurysm is an abnormal localized out pouching of a blood vessel. An aneurysm of a coronary artery is commonly defined as a localized dilatation exceeding the diameter of adjacent normal segments by 50%.[1] Giant coronary artery aneurysms are those more than 4 cm in diameter.[2] Coronary aneurysm can be fusiform, involving the full circumference of the blood vessel or saccular involving only a portion of the circumference. Fusiform aneurysms are much more common than saccular aneurysms.

Histopathologically all coronary aneurysms involve destruction of the tunica media which is thinned, sometimes markedly, sometimes to the point of no longer being identifiable between the tunica intima and tunica adventitia. The normal smooth muscle cells and elastic fibers are replaced by hyalinized connective tissue.[3]

The majority of coronary aneurysms are atherosclerotic in origin. Other causes include connective tissue disorders, trauma, vasculitis, congenital, mycotic and idiopathic. Giant coronary aneurysm may be associated with fistulas to a cardiac chamber, most commonly the left ventricle.[4] Most aneurysms are clinically silent, but those with an associated fistula may have an audible murmur and sign and symptoms of congestive heart failure.

The Coronary Artery Surgery Study (CASS) registry of 20,087 consecutive patients undergoing coronary angiography for suspected coronary artery disease was the largest series of patients with coronary aneurysms The CASS registry demonstrates a 4.9% incidence of coronary aneurysms (978 patients), and the right coronary artery was the most frequently involved vessel.[5] The incidence was 1.5% in a Russian autopsy series of 1000 hearts with atherosclerosis.[6] The right coronary artery was the most frequently involved artery, followed by the left anterior descending artery. Involvement of the left main artery is still rare.[7]

Although coronary artery aneurysms can be seen at any age, those that relate to atherosclerosis usually appear later in life. Patients with coronary artery aneurysm can either be asymptomatic or symptomatic. The symptomatic groups usually present with ischaemia or heart failure symptoms. Coronary artery aneurysm can impair coronary flow, may have thrombi that form an embolism distally to cause a myocardial infarction or can be complicated by rupture.[8]

Coronary angiography is the gold standard in the diagnosis of coronary artery aneurysm, and provides information regarding size, morphology and anatomic location as well as the presence or absence of coronary stenosis. However, in children with Kawasaki disease, coronary artery aneurysm is often visualized by transthoracic echocardiography.[9]

The prognosis of coronary artery aneurysm is not well known. In the CASS registry, no significant difference was present between the cases with or without coronary artery aneurysm with regard to survival.[5] For symptomatic coronary artery aneurysm most agree that surgery should be reserved for those patients with significant coronary stenosis, or those with significant angina despite adequate medical treatment.

Medical therapy is indicated for the majority of patients with coronary artery aneurysms who do not have significant coronary artery stenosis, and consists of treatment of coronary aneurysms involving antiplatelet and anticoagulant therapy, although this is based on anecdotal reports only when coronary thrombosis is present.[10] Lesions causing definite myocardial ischaemia have been treated with coil embolization, autologous saphenous vein graft and PTFE-covered stent grafts. These treatments are only described in case reports and have not been subjected to any controlled scientific investigation. Very large aneurysms or multi-vessel involvement are usually treated with coronary artery bypass.[11]

Conclusion

Our case highlights the potential problems associated with coronary aneurysms. Coronary aneurysm usually remains asymptomatic however they can be complicated by myocardial infarction resulting from thrombus formation or its embolization. Medical therapy including antiplatelets and anticoagulant therapy is recommended for the majority of patients with coronary artery aneurysms who do not have significant coronary artery stenosis. Those with significant underlying coronary stenosis covered stent or bypass surgery should be considered.

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