Ectatic coronary arteries, a cause for myocardial infarction with non-obstructive coronary arteries

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Abstract

Ectatic coronary arteries are an abnormal dilation of the coronary arteries and can contribute to the development of myocardial infarction with non-obstructive coronary arteries (MINOCA). We present a case of a previously unscreened 27-year-old man who presented with ischaemic type chest pain and was found to have ectatic coronary arteries on coronary angiogram. Despite the absence of significant stenosis, the patient experienced an acute myocardial infarction. The patient was treated with dual antiplatelet therapy and statins, and subsequent assessments showed normal echocardiography findings. Coronary artery ectasia (CAE) is a relatively uncommon condition often associated with coronary artery disease (CAD) and atherosclerosis. While antiplatelet therapy is indicated in CAE patients, the use of anticoagulation remains uncertain. Further research and clinical guidelines are needed to establish standardised management approaches for patients with CAE and MINOCA.

Keywords: ectatic coronary arteries, MINOCA, coronary artery ectasia

Introduction

Myocardial infarction with non-obstructive coronary arteries (MINOCA) is a distinct clinical entity characterised by evidence of myocardial infarction with either normal coronary arteries or coronary arteries with less than 50% stenosis.(1) Ectatic coronary arteries represent an uncommon coronary artery abnormality, characterised by the abnormal dilation of the arteries. Coronary artery ectasia is seldom inherited. It typically occurs due to acquired factors such as atherosclerosis, Kawasaki disease, certain infections, genetic disorders like Marfan syndrome, or inflammatory conditions like polyarteritis nodosa, Takayasu disease, or lupus. Iatrogenic causes, such as angioplasty, stent placement, or coronary atherectomy, can also lead to coronary artery ectasia. This condition can lead to the development of acute myocardial infarction (AMI), even in the absence of complete occlusion of the affected artery, due to sluggish blood flow and increased thrombotic risk.(2)

This case report presents a previously unscreened 27-year-old man with MINOCA, attributed to ectatic coronary arteries. The patient experienced ischaemic chest pain and was found to have ectatic coronary arteries during coronary angiography. Despite the absence of significant stenosis, the patient suffered an acute myocardial infarction. This case highlights the clinical significance of ectatic coronary arteries as a potential cause of MINOCA. While coronary artery ectasia (CAE) is relatively uncommon, it is important to recognize its association with AMI, and to develop standardised management approaches for patients presenting with this unique combination.
**Case presentation**

Our patient was a 27-year-old, previously unscreened man who presented with ischaemic type chest pain associated with sweating and radiation to the neck for 45 minutes. He was a non-smoker and his father had a myocardial infarction at the age of 45.

On examination, his BMI was 24.5 kg/m², blood pressure 117/77 mmHg, pulse rate 88 beats per minute. Other system examination findings were normal. At the emergency treatment unit, the ECG showed partial right bundle branch block and high sensitivity troponin I was 9.84 ng/mL(<0.034). The patient was given aspirin 300 mg, clopidogrel 300 mg, atorvastatin 40 mg as stat doses with subcutaneous enoxaparin 60 mg. The patient subsequently underwent an urgent coronary angiogram (CA). In the coronary angiogram, the left main coronary artery (LMCA), left anterior descending artery (LAD) and left circumflex artery (LCX) were normal. The right coronary artery (RCA) was ectatic and non obstructive (figure 1). His troponins dropped from 9.87 to 4.53 on the following day and echocardiography was normal with no regional wall motion abnormalities and an ejection fraction of >60%. On the lipid profile, total cholesterol was 223 mg/dL(<200), Triglycerides 70 mg/dL(<150), HDL 45 mg/dL(<50) and LDL 163 mg/dL(<100). His full blood count, liver profile and renal functions were normal.

Following the CA he was started on aspirin 75 mg, clopidogrel 75 mg, atorvastatin 40 mg and subcutaneous enoxaparin 60 mg twice daily for 3 days. He was discharged on day 4 with dual antiplatelets, a statin and cardiology follow up.

**Discussion**

Coronary artery ectasia (CAE) is a relatively uncommon coronary artery abnormality which is characterised by localised or diffuse dilatation of the coronary artery diameter exceeding the diameter of adjacent normal artery (reference vessel) segments by 1.5 times.(3,4) Clinical presentation can vary widely. They can be asymptomatic or present with atypical chest pain or typical ischaemic chest pain which can be either stable angina or acute coronary syndrome.(4) Coronary angiography is the main diagnostic tool used to diagnose CAE.(5), and an incidence of 1% to 5% of CAE has been identified in patients who undergo coronary angiograms.(3)

The pathogenesis and aetiology of CAE is not fully understood, but CAE is commonly associated with conditions like Kawasaki disease or familial hypercholesterolaemia.(6) The most common disease association is coronary artery disease (CAD) and about 85% of CAE patients are also found to have coronary atherosclerosis.(4) In fact, most studies have established a significant incidence of myocardial infarctions in CAE patients. Hence aspirin is indicated in all.(3-5) CAE with associated atherosclerosis has similar morbidity, mortality rates and risks to atherosclerotic coronary artery disease.(7) Hence, atherosclerotic CAE management consists of regular antiplatelet therapy(3) and aggressive risk factor management such as lipid control.(7) Drug groups such as statins, angiotensin-converting enzyme inhibitors, angiotensin II receptor blockers, and dihydropyridine calcium channel blockers have shown a beneficial effect in the management of CAE but most of the treatment options are based on expert opinion as there are no clinical guidelines to follow.(7)

Our patient was discharged with dual antiplatelets, a statin and routine cardiology follow up assessments. The decision to start him on anticoagulation was a dilemma since literature was unclear about it. Coronary blood flow disturbances have been observed in ectatic segments of coronary arteries, hence, some experts suggest that there's a place for anticoagulation.(3) Since data is insufficient to support this treatment, it should be individualised until further evidence is available.(3)

In a case where CAE presents as a STEMI the treatment options include medical thrombolysis, percutaneous stenting or surgical revascularization. (3) It is very important to note that both stenting and aspiration thrombectomy can result in distal thromboembolism.(7) Although CAE is a strong
independent risk factor for failure to achieve reflow after PCI for STEMI, and alternative management options may be needed, revascularization and mortality rates are comparable to those in patients without CAE.(8,9)

Conclusion

This case presentation underscores the importance of recognising and managing coronary artery ectasia (CAE) in patients presenting with chest pain. Although the aetiology and pathogenesis of CAE remain unclear, associations with conditions such as coronary artery disease (CAD) have been observed. Antiplatelet therapy, particularly aspirin, is indicated in CAE patients, and aggressive risk factor control is essential.

While there is no clear consensus on the use of anticoagulation in CAE, individualised treatment decisions should be made based on available evidence. Further research and clinical guidelines are needed to establish standardised management approaches for CAE patients.

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Received: 16 May 2024 Accepted: 12 Jun 2024