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CASE REPORT

Coronary Artery Ectasia with Acute Myocardial Infarction, A Case Report

Maysan M. Almegbel, MBBS [a,*], Fawaz Q. Almutairi, FRCPC [b]

[a] King Saud Bin Abdulaziz University for Health Sciences, College of Medicine, Riyadh, Saudi Arabia
[b] King Abdulaziz Medical City, Cardiac Center, Riyadh, Saudi Arabia

Abstract

Coronary artery ectasia (CAE), also known as aneurysmal coronary artery disease, is defined as an abnormal diffuse (ectasia) or segmental (aneurysmal) dilatation of any branch of the coronary arteries. It is a well-recognized entity with 1.2-4.9% prevalence.

Our case is a 46 year old male with no prior medical problem who presented to the ER with inferior ST elevation myocardial infarction (STEMI). The Coronary angiogram revealed multiple ectatic segments in the right coronary artery (RCA) with 100% stenosis in the middle segment. Upon wiring the RCA a big clot burden was noted on the ectatic segment. We planned to keep him on aggrastat infusion for 24 hours then re-cath him. The second cath showed complete resolution of the clot and the lesion was stented with drug eluting stent showing excellent final result.

We found that our case is interesting and unique in exploring the association of CAE that presents with STEMI and how to treat it safely in the cath lab, knowing that CAE is an uncommon finding during coronary angiography. CAE is associated with many coronary artery disease (CAD) risk factors and etiologies as well as pathologic progression. Patients with CAE are usually asymptomatic but can still present with symptoms of coronary artery occlusion. There is still no standard treatment specific for CAE itself, but when presenting with occlusive symptoms, management is guided by the extent of occlusion similar to CAD.

Keywords: Coronary artery ectasia, Coronary aneurysm, Coronary artery disease

1. Introduction

Coronary artery ectasia (CAE), also known as aneurysmal coronary artery disease, is defined as an abnormal diffuse (ectasia) or segmental (aneurysmal) dilatation of any branch of the coronary arteries [1,2]. It is recognized when a distention of a vessel exceeded 1.5 folds the width of a normal adjacent vessel [2]. Although considered infrequent finding during coronary angiogram, CAE is a well-recognized entity with 1.2-4.9% prevalence and male predominance (3:1 male:female ratio) [1,3]. CAE was found to be associated with a number of well known coronary artery disease (CAD) risk factors especially atherosclerosis, which is considered the main acquired etiology in 50% of adults with CAE [1,2,4]. Other etiologies included congenital causes and vasculitides in young adults and children [4,5]. Furthermore, 90.8% of patients with CAE were found to have CAD as reported by Swaye *et al*, [1] and in 84.7% of patients in another study [6]. Also, while most patients are asymptomatic, others may present with symptoms of CAD [4,5]. Likewise, here we present a case of a male with CAE who presented with symptoms of ST elevation myocardial infarction (STEMI).

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* Corresponding author at: Al Hars Al Watani, Ar Rimayah, Riyadh, 14611, Saudi Arabia.
E-mail address: Maysan.m.m15@gmail.com (M.M. Almegbel).

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2. Case

Our patient is a medically free 46 year old male who presented to the ER with severe chest pain. His initial ECG showed ST segment elevation in lead II, III, and AVF; therefore, he was diagnosed to have inferior STEMI. Cathlab was activated for primary PCI and initial coronary angiogram showed normal left main and left circumflex (LCX) arteries, mild atherosclerosis in left anterior descending artery (LAD), and multiple ectatic segments with 100% stenosis in the middle segment of the right coronary artery (RCA) (Fig. 1). He underwent PCI to RCA and after crossing the lesion, coronary angiography showed big clot burden on the ectatic segment (Fig. 2). The plan was to keep him on aggrastat infusion for 24 hours then re-cath him as per usual practice. The second cath showed complete resolution of the clot (Fig. 3) and the lesion was stented by a drug eluting stent 5 × 12 with excellent final result (Fig. 4).

3. Discussion

As CAE can be found in various coronary vessels in a different manner, one form of classification is based on configuration, which categorizes the lesion by measurements into: a. transverse saccular diameter more than longitudinal length, b. transverse fusiform diameter less than longitudinal length [4]. Another method of classification is based on the degree of ectasia and number of vessels involved into 4 types, as described by Markis et al. [7]:

1. Diffuse ectasia in two or three vessels.
2. Diffuse ecatsia involving one vessel and localized disease in another.
3. One vessel with diffuse ectasia.
4. One vessel with localized disease.

Abbreviations

CAE	coronary artery ectasia
CAD	coronary artery disease
STEMI	ST elevation myocardial infarction
LCX	Left circumflex coronary artery
LAD	left anterior descending artery
RCA	right coronary artery
DM	Diabetes mellitus
ACS	acute coronary syndrome
MI	myocardial infarction
MRA	magnetic resonance angiogram
CTA	computed tomography angiogram
PCI	percutaneous coronary intervention

When comparing the incidence of CAE between coronary arteries, the most common location was RCA, especially the proximal and middle segments, followed by LAD then LCX and the least involved was the left main coronary, as observed by Swaye et al. as well as other studies [1,3,6]. Likewise, our patient had multiple ectatic segments in the RCA followed by severe stenosis of the middle to distal part while the other coronary arteries were completely lesion free.

Although the specific mechanism leading to CAE is still not very well understood, it was found that risk factors and pathophysiology behind CAD were also associated with CAE [4]. As previously mentioned, atherosclerosis and vascular remodeling were on top of the suggested mechanisms [1,4,5]. Further risk factors include hypertension, hyperlipidemia, smoking cigarettes, and male gender [1,4]. While diabetes mellitus (DM) is considered a

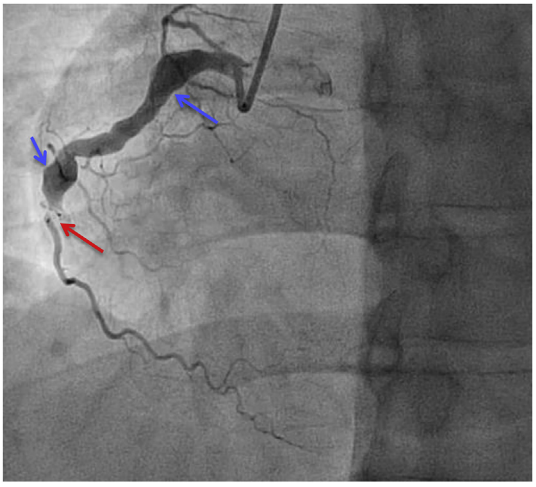

Fig. 1. Multiple ectatic segments (blue arrow) with 100% stenosis (red arrow) in the middle segment of the right coronary artery.

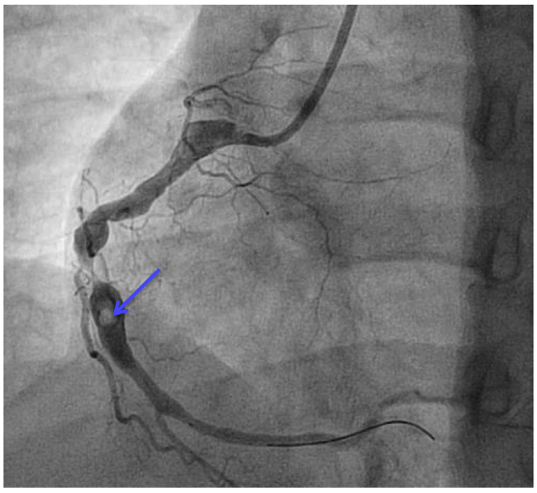

Fig. 2. Big clot burden (blue arrow) on ectatic segment as shown.

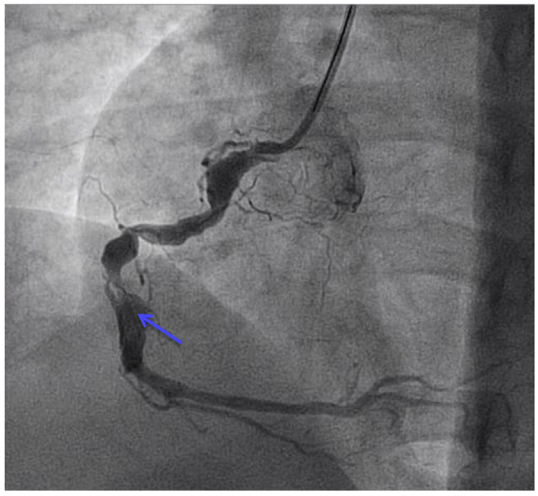

Fig. 3. Complete resolution of the clot (blue arrow) after aggrastat infusion.

protective factor or an independent factor in most reported cases, in Saudi Arabia, one study found that DM was associated with many CAE patients [4,8]. Other etiologies can contribute to the development of CAE such as vasculatides (Kawasaki disease, polyarteritis nodosa), connective tissue diseases (rheumatoid arthritis, systemic lupus erythematous, scleroderma), Marfan syndrome, and iatrogenic causes (stenting, angioplasty, coronary atherectomy) [4-7]. Having many cofounders involved in the process, patients with CAE can present with symptoms of the coexistent disease.

Some studies mentioned stable angina as the most common presentation of patients with CAE while others denied any specific symptom to the disease [4,5]. The clinical picture of a patient with CAE may include symptoms of acute coronary syndromes (ACS) due to the turbulent blood flow in diseased vessels and thrombus formation [4,5,7]. Findings may include chest pain, myocardial infarction (MI), positive exercise stress test, or ST-elevation [2,5,7]. Similarly, our patient presented with chest pain and inferior STEMI due to the complete stenosis of the RCA following the ectatic segment. Furthermore; even with the development of imaging techniques such as coronary magnetic resonance angiogram (MRA) and coronary computed tomography angiogram (CTA), coronary angiography remains the gold standard for diagnosing CAE [4,7]. Angiography findings can show impaired microvascular perfusion with or without decrease epicardial flow, segmental back flow, and delayed dye filling [4,5].

Fig. 4. Patent RCA after stenting.

When designing a treatment plan for patients with CAE, all risk factors must be taken into consideration along with the coexisting diseases. Treatment is directed towards risk reduction (management of atherosclerosis and hypertension) in addition to management of CAD and obstructive lesions if found; thus, treatment can include medical, angioplasty, and surgical modalities [1,5]. Aspirin has been suggested for all CAE patients since most have coexistent coronary artery obstructive lesions and high likelihood of developing MI [4,5]. Other medications such as chronic anticoagulants and combined antiplatelets with adenosine diphosphate inhibitors have yet to be evaluated [4]. Percutaneous coronary intervention (PCI) can be used for patients with obstructive CAD associated with CAE when medical treatment fails or when investigations show substantial ischemia [4,9]. In addition, PCI using coated stents was shown to be superior over bare metal ones [9]. Likewise, our patient was treated eventually with PCI coated stent but after making sure there were no clots that may compromise stent revascularization. Surgery is another option for CAE and the indications are similar to those for patients with CAD [4]. It may also be a better option for large aneurysms with an increased chance of rupturing [5,10].

4. Conclusion

CAE is an uncommon finding during coronary angiography. It is highly associated with many CAD risk factors and etiologies as well as pathologic progression. Patients with CAE are usually asymptomatic but can still present with symptoms of coronary artery occlusion. There is still no standard treatment specific for CAE; however, management is guided by the extent of occlusion similar to CAD.

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