

Clinical and Angiographic Characteristics of Cases with Ectatic Coronary Artery Disease

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Abstract

Background: Coronary artery ectasia (CAE) is a well recognized angiographic finding, characterized by abnormal dilatation of the coronary arteries. Abnormal epicardial dilatation of the coronary arteries has been recognized for decades. The most widely used term for this condition now is "coronary artery ectasia". However, the incidence of CAE is may be due to several factors. The present study is done to study the clinical as well as angiographic characteristics of the patients who underwent coronary angiography. **Methods:** A total of 600 CAG's (coronary angiography) done were randomly selected from our institute and were reviewed. Calculation of vessel lumen diameter and clinical variables such as age, sex, and occupation and serum lipid levels were noted. **Results and Observation:** Among the 600 CAG's reviewed 20 cases were (3.3%) were found to have Coronary artery ectasia (CAE) among 16 were male (80%) and 4 (20%) were female. Parameters like both diabetic and hypertensive, obesity conditions were also evaluated. The present study also evaluated that the atherosclerotic coronary artery disease as the major cause of ectasia. Markis Type IV was found to be high when compare with other types. **Conclusion:** Coronary artery ectasia represent not an uncommon form of atherosclerotic coronary artery disease seen in approximately 5% cases undergoing coronary angiography. In view of the slow progression and complex manifestations of atherosclerosis, CAD at a certain stage might result in aneurysmal dilatation. This transition is unpredictable based on our current knowledge. The present study is a small step in understanding them.

Keywords: Coronary artery ectasia; Coronary artery disease; Diabetes; Hypertension and obesity.

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Introduction

Coronary artery ectasia (CAE) is the abnormal enlargement of coronary artery. It is a well

recognized finding in cases undergoing coronary angiography.¹ Most of the cases are seen in cases with concomitant coronary artery disease (CAD). Other causes like polyarteritis nodosa, Takayasu arteritis, trauma, congenital & Iatrogenic are well established. The prognosis treatment, etiology of the disease still remains an enigma. The first case report of a coronary artery aneurysm was by Bourgon (1812) who described the postmortem finding of a RCA dilatation in a patient who died suddenly. The prevalence of CAE varies from 1.2% to 5.3% which might be linked to different

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demographic characteristics of the population and specific genetic environmental predisposition.^{2,3}

Earlier studies suggested that congenital aneurysms were the most common type with septic emboli also being frequent. Then, later it was found atherosclerosis is the commonest etiological factor. Several studies have evaluated the traditional cardiovascular risk factors in cases with CAE and compared them in those with CAD.^{4,5} Age has been shown to constitute a significant factor that is inversely associated with the presence of CAE.

Hypertension and dyslipidemia were also reported to be implicated in the pathogenesis of CAE.⁶ Smoking was found to be more common in cases with CAE.⁷ Cocaine usage was also found to be independent predictor of CAE in cases in whom smoking was excluded. A 6 time high prevalence of CAE in cases with familial hypercholesterolemia is reported.⁸

Diabetes mellitus, a well known risk factor is positively associated with coronary artery disease and its complications.⁹ This is also proven by studies on carotid intima, medial thickness. Supporting this, demographic data of cases referred to various studies for CAD shows a low prevalence of DM in cases with CAE. Diabetes is known to promote negative remodeling and impair the compensatory arterial enlargement during the course of the disease. This is in accordance with the observation of increased prevalence of abdominal aortic aneurysms in cases without diabetes. This suggests that pathogenesis of CAE is not simply a variant of atherosclerosis. The purpose of this study is to study the clinical as well as angiographic characteristics of the patients who underwent coronary angiography.

Materials and Methods

During our study period about 600 CAG's (coronary angiography) done were randomly selected from our institute and were reviewed. The clinical data of cases that were found to have ectatic coronaries were collected and analyzed. The coronary angiograms were performed over SIEMENS angiographic system using the ionic contrast media. The choice of nonionic contrast was according to the clinical condition of the patient.

Calculation of vessel lumen diameter and assessment of the severity of lesions were visually graded by experienced cardiologists from our institute. A vessel diameter stenosis of more than

50% was considered to be significant in accordance with the CASS study. In case of borderline disease, the help of quantitative angiography was taken. LV angiograms were not performed during the angiographic study.

The clinical variables such as age, sex, occupation were noted directly by asking the patient. History of smoking habits, alcohol consumption, gutka chewing were noted. Those with a fasting blood sugar beyond 126 mg% or a 2 hr post prandial levels of >200 mg% were labeled as diabetic. The serum lipid levels were obtained from a fasting sample with an emphasis on Triglycerides, LDL cholesterol & HDL cholesterol. Dyslipidemia was diagnosed as triglyceride of more than 200 mg%, LDL of more than 100 mg% and HDL <35 mg%.

The mode of clinical presentation were asked and classified into 4 categories like Chronic stable angina if there is chest pain only on exertion, Unstable angina if chest pain even during rest and Acute Myocardial Infarction if there is history suggestive of MI with the following ECG changes. Cardiac enzymes evaluation was not done. History of thrombolytic therapy is noted.

Cases were classified as old MI in the presence of pathological Q waves in ECG and Regional wall motion abnormalities as assessed by 2D echocardiography performed over PHILLIPS IE 33. They predominantly have shortness of breath as their main symptom. These types of cases were classified as congestive cardiac failure group.

History of any previous revascularizations either medical or surgical was noted. The size of ectasia were noted and classified according to the Markis classification. The distribution of ectatic segments in both right and left coronary systems were noted. Other angiographic abnormalities like stasis, dissection in the ectatic segment, flow rate or the presence of thrombus were noted.

Results

Among the 600 CAGs reviewed 20 cases were (3.3%) were found to have coronary ectasia. All the 20 cases were associated with coronary artery disease.

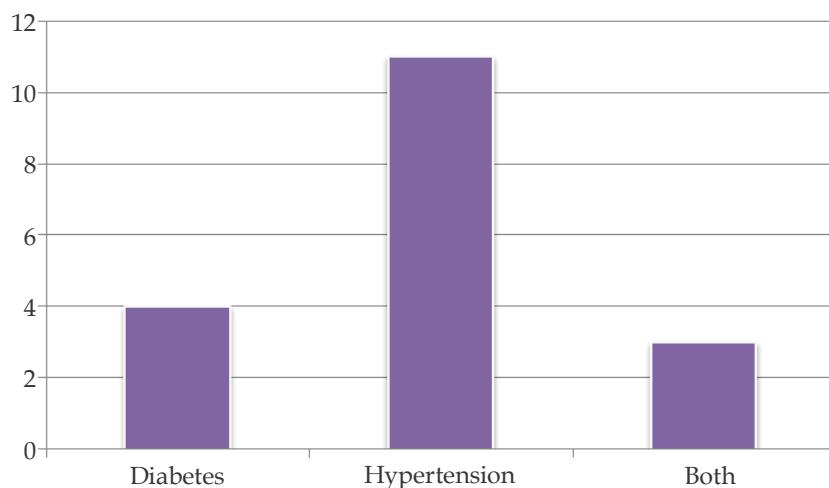
Among the 20 cases 16 were male (80%) and 4 (20%) were female. History of Smoking habit was found in 15 cases, 10 cases gave a history of alcohol abuse and 2 cases gave a history of tobacco chewing (gutka eaters) (**Table 1**).

Table 1: Socio-demographic Profile of the Subjects

		No. of Cases (n = 20)	Percentage (%)
Gender	Male	16	80
	Female	4	20
Habits	Smoking	15	75
	Alcohol	10	50
	Tobacco chewing	2	10

In the present study, prevalence of coronary ectasia was 3.3%, similar observation of prevalence was found from major studies like CASS which are in accordance with earlier studies.¹⁰⁻¹²

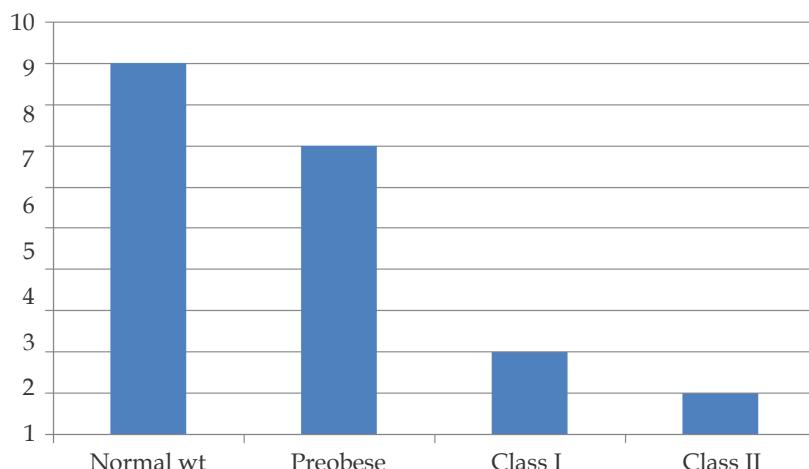
About 11 cases were hypertensive, 4 cases were diabetic and 3 cases were both diabetic and hypertensive (**Fig. 1**).

**Fig 1:** Distribution of individuals according to diabetic and hypertensive.

This is in accordance with the inverse association between Diabetes Mellitus and coronary ectasia found in previous studies.¹³ The explanation given probably was diabetes is known to promote negative remodeling and impair the compensatory

negative remodeling during the course of disease.

Among the 9 cases 9 were normal weight, 7 were preobese, 2 were Class I obese, and one patient is class II obese with a BMI of 35.74 (**Fig. 2**).

**Fig. 2:** Distribution of individuals according to weight.

In the present study, 6 cases had acute myocardial infarction as the mode of clinical presentation. Of them 1 had inferior wall involvement other 5 had anterior wall involvement. Whereas, 4 cases had chronic stable angina while 6 cases had unstable angina as their presentations. About 4 cases presented with congestive cardiac failure with shortness of breath as predominant symptoms.

Among abnormal lipid levels, 8 cases (40%) were with a triglyceride level of >150 mg, 6 cases were with an LDL cholesterol >100 mg% where as low HDL of <35 mg% was seen in 2 cases. A total of 11

cases show an abnormal lipid status in any of the three accounting for about 55% of total population. Our observations are in accordance with earlier study by Sudhir and co-workers showed the same in 43.4% cases.¹²

The present study atherosclerotic coronary artery disease as the major cause of ectasia. Out of 20 cases, 19 cases were found to have significant narrowing of coronaries. Among them, 13 cases (68%) have significant single vessel disease, 4 cases has a double vessel disease (21%), 2 cases has a triple vessel disease (10.5%) (Fig. 3).

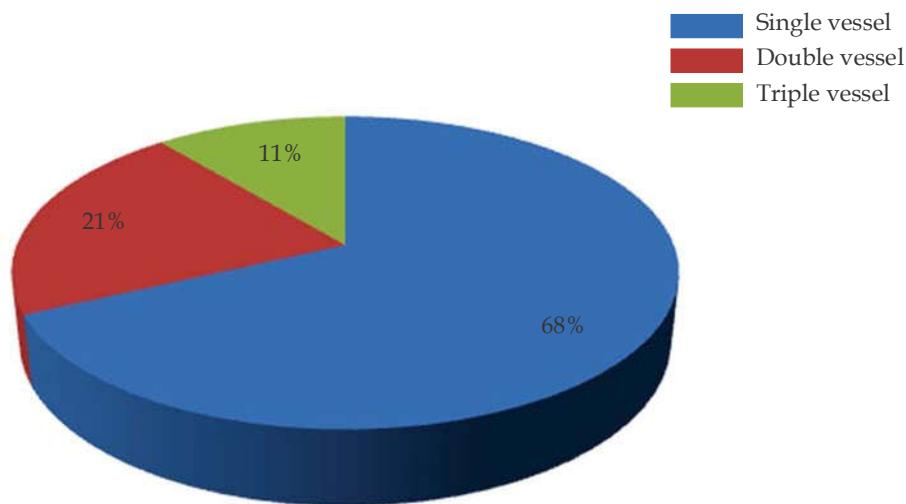


Fig. 3: Distribution of individuals according to vessel involvement.

Out of the total vessels with ectasia, LAD is involved in 8 cases, Left circumflex is ectatic in one patient whereas right coronary is involved in a high

number of cases, i.e. 10. Three cases showed ectasia in both LAD & RCA distribution. One patient has ectasia in LAD as well as LCX distribution (Fig. 4).

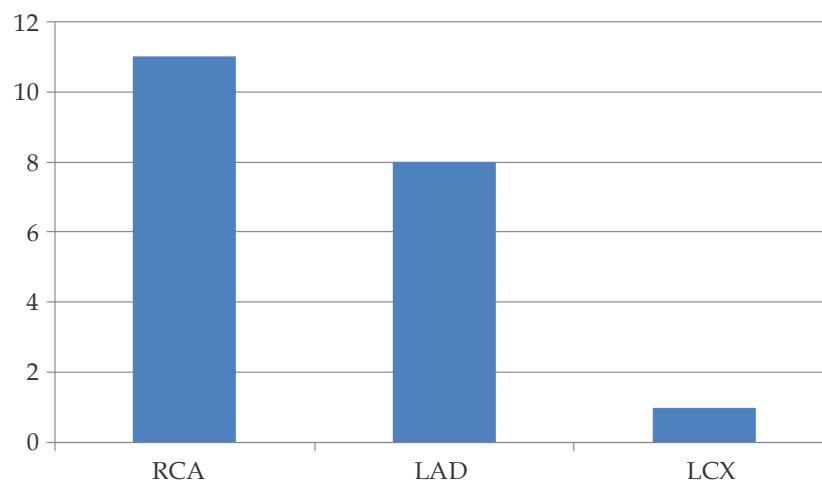


Fig. 4: Distribution of individuals with ectasia

Aboeata *et al.*¹⁵ showed involvement of RCA as most common vessel involved, i.e. 64% cases followed by LCX (55%), LAD (51.5%) and LMCA in 6.5% cases. Other studies from Greece by Vassilios and group¹⁰ showed a right coronary involvement in 52.6%, circumflex and LAD involvement in 24.8% and 16.4% respectively. Even though circumflex is the second most common vessel involved in the above two studies, the difference is statistically insignificant. This is in contrast to our present experience which showed LAD as the second most

common vessel involved.

When the ectasia were analysed, Markis Type IV was found in 14 cases (70%), Type III ectasia in 2 cases, Type II in 2 cases where as Type I in 2 cases. Aboeata *et al.*¹⁵ found markis Type IV being the most common in the subgroup of cases with CAE and CAD, Type III in the subgroup without CAD. If Type I and II were considered to be having severe ectasia, severe ectasia is found in 3 cases in our study (Fig. 5).

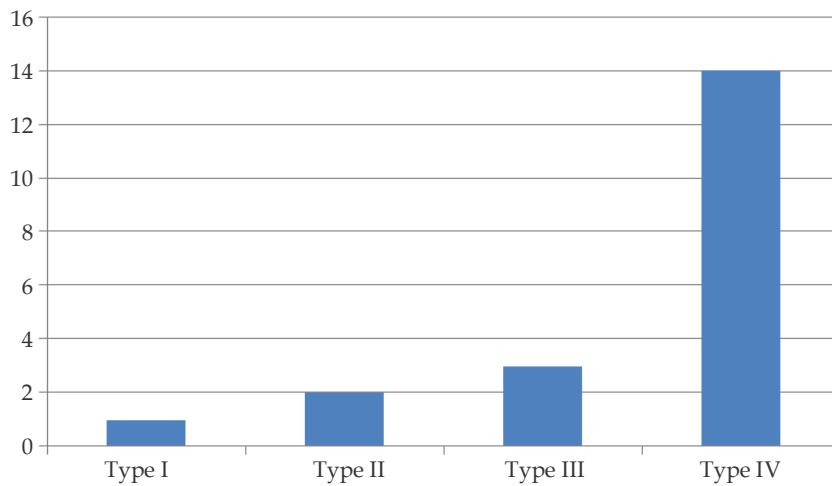


Fig. 5: Distribution of individuals according to Marik's type

Conclusion

Coronary artery ectasia represent not an uncommon form of atherosclerotic coronary artery disease seen in approximately 5% cases undergoing coronary angiography. In view of the slow progression and complex manifestations of atherosclerosis, CAD at a certain stage might result in aneurysmal dilatation. This transition is unpredictable based on our current knowledge. Still there are some unanswered questions between CAE and CAD regarding their etiology, prognosis & therapy because of association of CAE with other dilating arterial and venous disease. The present study is a small step in understanding them.

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