Original Article

Coronary Artery Ectasia, its Clinical Profile and Angiographic Characteristics, Single Centre Experience

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Abstract

Objective: To evaluate the incidence of coronary ectasia and its, its clinical profile and angiographic characteristics in our population.

Methods: A retrospective analysis was conducted on all coronary angiograms performed at the catheterization laboratory of Ch. Pervaiz Elahi Institute of Cardiology, Multan between the period of January 2011 and December 2012. Data were collected from catheterization films, and medical records.

Results: In a total of 6540 coronary angiograms were performed during the period of the study. A total of 225 (3.44%) angiograms showed coronary ectasia of both mixed and pure types. Pure ectasia with no coronary obstructive lesions was seen in 58 (25.77%). Type 4 was most common 95 pts. (42.22%), as per the Markis classification. Right coronary artery (RCA) was the most commonly affected vessel 162 (72%) followed by left anterior descending artery (LAD) 76 (33.78%) and 38 patients (16.88%) patients had circumflex artery involvement. 132 patients (58.66%) had good left ventricular (LV) systolic function.

Conclusion: Prevalence of Coronary ectasia in the population presenting to Ch. Pervaiz Elahi Institute of Cardiology, Multan during the study period was 3.4%. Majority of patients were males, associated with, hypertension and diabetes mellitus. CAE was associated with obstructive coronary artery disease in about 74.22% of cases.RCA was the most commonly affected vessel.

Keywords: Coronary artery disease, Ectasia, Aneurysm, coronary artery angiography.

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Introduction

Coronary artery ectasia (CAE) is characterised by segmental or diffuse dilatation of the coronary artery to

more than 1.5 times the diameter of the adjacent segment of the same artery or different arteries.[1] It is a well – recognized pathological finding observed by pathologists and cardiologists for more than two centuries. As its first description by Morgagni[2] described it first as frequent form of coronary artery disease. Its cause, clinical sequelae and treatment puzzled the clinicians. CAE has been found in 1 – 5% during coronary angiography.[3-8] In the largest series from the CASS registry, Swaye *et al.*[3] found CAE in 4.9% of more than 20 000 coronary angiograms they reviewed. More than half of CAE are due to coronary atherosclerosis, but occasionally they are related to other pathological entities.[9]

Coronary angiography remains the gold standard for the assessment of CAE.[10] In the majority of cases, CAE accompanies atherosclerotic coronary disease. The clinical presentation and the long – term cardiac complications are mostly associated with the severity of the co-existing coronary lesion. CAE appears to be associated with traditional cardiovascular risk factors such as hypertension, smoking and lipidaemia, but not with diabetes mellitus.[11]

"Pure" coronary ectasia can be implicated in angina or myocardial infarction, worse prognosis depends on the association of stenotic coronary artery disease.[12,13] Markis classified CAE in four types: type 1 includes diffuse ectasia involving two or three vessels, type 2 includes diffuse ectasia involving one vessel and discrete ectasia in another, type 3 includes diffuse ectasia in only one vessel, and type 4 includes localized or segmental ectasia in only one vessel.[14] Coronary artery ectasia may lead to exercise induced ischaemia, especially in the diffuse form.[15] CAE is thought to be present in patients with a slow blood flow. It is usually not a benign condition, as normal smooth laminar flow is disrupted with a potential of thrombus formation. CAE is characterized by diffuse or localized inappropriate dilation of coronary arteries and is often associated with slow coronary blood flow in the presence of hypertrophic cardiomyopathy.[16]

All three coronary vessels can be affected by CAE, but in 75% of patients an isolated artery is ectatic. In patients with concomitant coronary artery disease, the proximal and mid-segments of the right coronary artery are the most frequently involved, followed by the left anterior descending artery and the circumflex artery.[17] The specific causative mechanisms of abnormal dilatation of the lumen in CAE are essentially unknown. Elevated C-reactive protein levels may suggest an inflammatory process as a cause.[11]

The co-existence of CAE with obstructive coronary lesions in the great majority of patients and the isolated coronary ectasias have led to the generalised administration of aspirin in all patients with CAE.[17] Current literature suggests that ectatic coronary arteries, even without the presence of coronary stenosis, are subject to thrombus formation, vasospasm, and spontaneous dissection.

Patients and Methods

We retrospectively analyzed 6000 patients who underwent coronary angiogram at the catheterization laboratory of Ch. Pervaiz Elahi Institute of Cardiology, Multan between the period of January 2011 and December 2012. Data were collected from catheterization films, and medical records .Demographic data was collected. Conventional risk factors like hypertension, DM, smoking, and dyslipidemis were noted. The continuous variables were presented as means ± standard deviation, and the categorical variables as percentages.

The reasons for catheterisation of these patients were history of angina, previous or an acutemyocardial infarction, positive treadmill test and / or presence of multiple coronary risk factors. Patients with valvular or congenital heart disease and cardiomyopathies were excluded. Coronary ectasia was defined by CASS criteria as: Diameter of a vessel in the coronarography up to one and half times the diameter of a adjacent normal branch. Discrete ectasia was defined when the ecstatic segment was less than 1 cm and diffuse when it was more than or equal to 1 cm in length. In cases of diffuse ectasia, the diameter of the corresponding artery in a normal angiogram was taken as the reference. Ectasia was classified according to the *Markis classification* (Table 1).[7]

In decreasing order of severity, diffuse ectasia of two or three vessels was classified as **Type I**; diffuse disease in one vessel and localised disease in another vessel as **Type II**; diffuse ectasia of one vessel only as **Type III**, and localized segmental ectasia as **Type IV.**

This involved finding the major coronary vessels involved and classifying the ectasia in each vessel involved as diffuse or focal. Assessment of the severity of ectasia and CAD was done visually by experienced cardiologists. Co-existing coronary artery disease with luminal narrowing < 50% were considered pure type and patients with > 50% arterial narrowing were considered as mixed type.

Results

During the study period, 6540 coronary angiograms were performed. Two hundred and twenty five (3.44%) showed coronary ectasia. Mean age of the patients was 54.2 ± 9.2 years (range 26 to 82 years). Among them 153 (68%) were younger than 60 years of age. A predominance of the male sex was seen (190, 84.5%). And females were 35 (15.5%).135 (60%) patients were hypertensive, 92 (40.88%) were smoker and 52 (23.11%) were diabetic. Lipid abnormalities were detected in 102 (45.33%) patients with low HDL being the most common abnormality, seen in 124 (55%) patients.

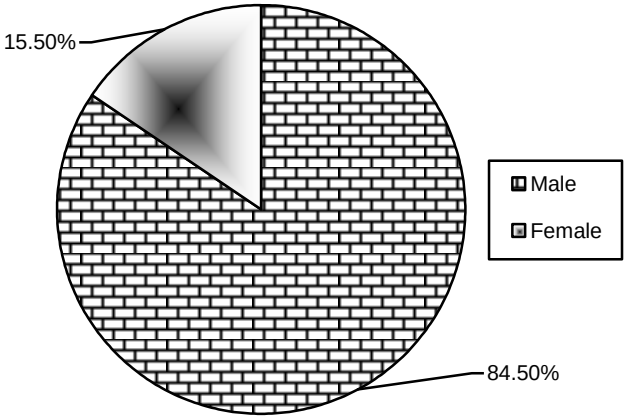

Figure 1: Proportion of patients according to sex.

Out of two hundred and twenty five (3.44%) patients, fifty eight angiograms (25.77%) showed pure and one sixty seven angiograms (74.22%) showed mixed type of ectasia. The right coronary artery (RCA) was the commonest affected vessel by ectasia 162 (72%), followed by left anterior descending artery (LAD) in 76 (33.78%) of the patients. Left circumflex coronary artery (LCX) was involved in 38 (16.88%) (Table 1). The distribution of vessels involved as per the Mark is classification, type 4 was most common 95 patients (42.22%), followed by Type 1, 76 patients (33.77%). Rest of 38 patients (16.88%) and 16 patients (7.11%) were in type 2 and 3 respectively (Table 2). In a total of 132 patients (58.66%) had good left ventricular (LV) function, 69 patients (30.66%) had moderate left ventricular (LV) function while 24 (10.66%) had severe LV dysfunction.

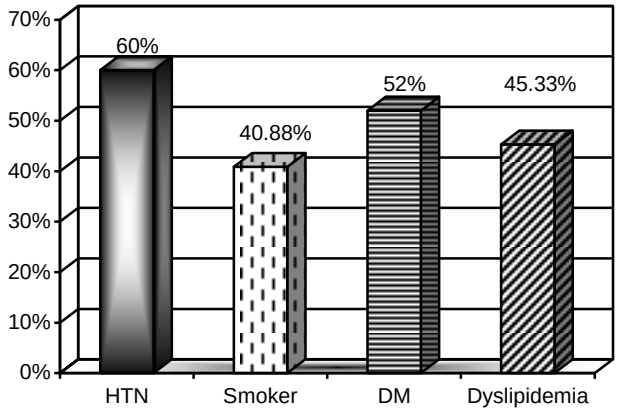

Figure 2: Risk factor profile of the patients.

Table 1: Involvement of coronary vessels.

Vessels	No. of Patients	Percentage of Patients
LAD	76	33.78%
LC*x*	38	16.88%
RCA	162	72%

Table 2: Distribution of vessels involved as per the Mark is classification.

Types	Vessels Involvement Pattern	No. of Patients	Percentage of Patients
Type 1	Diffuse ectasia of two or three vessels	76	33.77%
Type 2	Diffuse disease in one vessel and localised disease in another	38	16.88%
Type 3	Diffuse ectasia of one vessel only	16	7.11%
Type 4	Localized segmental ectasia	95	42.22%

Discussion

Coronary artery ectasia is considered an uncommon angiographic finding with varying patterns of presentation and prevalence. A number of studies and analysis have been conducted with a view to understand this entity and try to establish an effective line of management.

Tunick et al., found that discrete ectasia develops only in the presence of tight stenosis[18] but in our study, however, we identified patients with isolated discrete ectasia without significant co-existing stenosis.

Lipid abnormalities have been incriminated in the genesis of ectasia with one study showing increased prevalence in patients with Familial Hypercholesterolemia and a strong inverse association between High Density Lipoproteins and ectasia.[19] In our study, we also noted that o have low HDL levels is the most common lipid abnormality.

There is no documented influence of age on ectasia according to Sharma et al.[20] Our study also supported that there is no specific difference in the pattern of ectasia between the various age groups.

Harikrishnan[5] Demopoulos[21] and found the RCA to be the most commonly involved vessel followed by the LCX and later the LAD. RCA was the most common vessel involved in our study followed by LAD and Lc*x*.

The limitations of our study was lack of angiographic follow-up. Furthermore, estimation of stenosis in the presence of ectasia was done visually, not by the quantitative computerised analysis.

In conclusion, our study showed a relatively high angiographic prevalence of obstructive coronary artery disease in about 74.22% with a predominant involvement of the RCA (72%) and male population (84.5%). Type 4 was most common type (42.22%) and 58.66% patients had good LV systolic function.

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