

The Frequency of Angiographic Ectasia in Diagnostic Coronary Angiography at Queen Alia Heart Institute

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ABSTRACT

Objective: To determine the frequency of coronary artery ectasia, and to describe its clinical features and association with coronary artery disease, among patients who underwent diagnostic coronary angiography at Queen Alia Heart Institute.

Methods: This is a descriptive, and a retrospective review study which was conducted at Queen Alia Heart Institute on 5000 adult patients who underwent diagnostic coronary angiography for chest pain suspicious of angina pectoris during the period between 2006 to 2011. The angiograms reports were reviewed for the presence of coronary artery ectasia, and its manifestations were studied from their medical records. A specially designed medical record abstract form was used to record the following data: Gender, type of coronary ectasia (diffuse or localized), affect coronaries and association with Stenotic Coronary Artery Disease. Simple descriptive statistics (frequency, mean, percentage) were used to describe the study variables.

Results: The total number of cardiac angiograms studied was 5000 cases. One hundred-forty patients (2.8%) had coronary ectasia. Males constituted the majority (87.1%) of the affected patients. Isolated right coronary artery ectasia was the commonest (36.4%), but isolated left main ectasia was rare (2.1%). Ectasia involving all the coronary arteries was found in 19.3% of patients. Diffuse coronary ectasia was found in two thirds of the angiograms, and associated coronary artery disease was found in 56.4% of the ectatic coronaries.

Conclusion: Coronary Artery Ectasia is a well recognized and uncommon clinical entity. The diffuse type is more common than the localized one. Right coronary artery is more affected than other coronaries. Multivessel ectasia and coronary stenoses were common in our study patients. Recognition of Coronary Artery Ectasia at angiography is essential for proper therapy and appropriate follow-up for secondary prevention of Coronary Artery Disease.

Key words: Angiography, Coronary Artery Ectasia, Queen Alia Heart Institute

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Introduction

Coronary Artery Ectasia (CAE) refers to an abnormal dilatation of the coronary arteries. When the dilated area is more than 1.5 times the reference diameter of the normal portion of the artery, the enlarged portion is considered ectatic.⁽¹⁾ Ectatic vessels appear to be prone to thrombus formation, dissection and spasm.⁽²⁾ CAE has been found in 1-

5% during coronary angiography.^(3,4) CAE is attributed to atherosclerosis in about half of cases, whereas other cases of ectasia have been described in association with inflammatory or Connective Tissue Disease.^(5,6) Kawasaki disease,⁽⁷⁾ and in a small ratio of cases CAE can be congenital in origin.⁽⁸⁾

Currently, there is more interest in other proven

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Table I: Frequency of CAE in total and according to gender

Total	No. of patients with ectasia	Male	Female
5000	140	122	18
%	2.8	87.1	12.9

CAE: Coronary Artery Ectasia

Table II: Distribution of coronary ectasia according to the involved vessel

	RCA alone	LAD alone	Cx. alone	LM alone	Two vessels involved	All vessel ectasia	Total
No.	51	21	11	3	27	27	140
%	36.4	15.0	7.9	2.1	19.3	19.3	100

RCA: Right Coronary Artery LAD: Left Anterior Descending Artery Cx: Circumflex Artery LM: Left Main Coronary

Table III: The pattern of ectasia in the involved coronary

	Total	Diffuse CAE	Proximal CAE	Distal CAE
No. of patients	140	86	48	6
%	100	61.4	34.3	4.3

CAE: Coronary Artery Ectasia

Table IV: Frequency of CAD within the ectatic segment among patients with CAE

	CAE with associated CAD	CAE without CAD	Total
No. of patients	79	61	140
%	56.4	43.6	100

CAD: Coronary Artery Disease CAE: Coronary Artery Ectasia

Table V: Frequency of CAD in the non-ectatic coronaries in patients with CAE

	Presence of CAD	Absence of CAD	Total
No. of patients	76	64	140
%	54.3	45.7	100

CAD: Coronary Artery Disease CAE: Coronary Artery Ectasia

modalities in the diagnosis of CAE before going to the invasive coronary arteriography. For example, Magnetic Resonance Angiography (MRA),⁽⁹⁾ and Computed Tomography (CT) scan.^(10,11) Diagnosis of CAE is important specially when considering the severity of the disease and treatment options like medical therapy, angioplasty or surgery. This study was conducted to determine the frequency of coronary artery ectasia, and to describe its clinical features and association with coronary artery disease, among patients who underwent diagnostic coronary angiography at Queen Alia Heart Institute.

Methods

This is a descriptive, and a retrospective review study which was conducted at Queen Alia Heart Institute in Amman – Jordan, during January 2006 to January 2011, on 5000 adult patients (>18 years) who underwent diagnostic coronary angiography during that period because of the main complaint of chest pain.

The angiograms reports were reviewed for the presence of coronary artery ectasia and its clinical

features as mentioned in their medical records. Ectasia was considered present when the area of dilatation was more than 1.5 times the diameter of the normal portion of the coronary artery. Patients known to have congenital structural heart disease were excluded from the study.

A specially designed medical record abstract form was used to record the following data: Gender, type of coronary ectasia (diffuse or localized), affected coronaries and association with stenotic coronary artery disease. The frequency of coronary ectasia was calculated. Simple descriptive statistics (frequency, mean, percentage) were used to describe the study variables.

Results

Table I presents the frequency of CAE among the study group which was 140 patients (2.8%). Males were the majority (87.1%) of patients with CAE.

Table II shows the distribution of CAE according to the involved vessel. The commonest was the right coronary artery (36.4%), followed by the left anterior descending artery (15.0%). Isolated left

main artery ectasia was present in 2.1%. Two vessels ectasia and three vessels ectasia had equal frequencies with 19.3% of cases for each category.

Table III demonstrated the pattern of ectasia in the involved coronary artery, the diffuse pattern was the commonest (61.4%) followed by proximal ectasia in 34.3% of cases, whereas localized distal ectasia being the lowest (4.3%).

As illustrated in Table IV, Stenotic Coronary Artery Disease was found in 56.4% of the ectatic coronaries, which was almost similar to the ratio of stenotic coronary artery disease among the non ectatic coronaries in patients with CAE (54.3%) – as shown in Table V.

Discussion

Coronary Artery Ectasia is a well-recognized, albeit uncommon, finding in diagnostic coronary angiography and is defined as an abnormal dilatation of a segment of the coronary artery to a diameter of at least 1.5 times that of the normal adjacent segment. It was first described by Bourgon in 1812,⁽¹²⁾ while the term "ectasia" was first coined by Bjork in 1966.⁽¹³⁾

Its prevalence varies from 0.3-4.7%. Its clinical significance is unclear, there is some dispute regarding its relation to occlusive coronary heart disease. The mechanism behind dilatation in some, with stenosis in other, individuals with atherosclerotic heart disease remains obscure. In various reports, ectasia has been described either as an isolated congenital lesion, or in association with coronary atherosclerosis, syphilis, congenital heart disease.⁽⁸⁾ scleroderma, polyarthritis nodosa, Ehlers Danlos Syndrome, bacterial infections and Kawasaki disease.^(5,6,7)

Cardiac catheterization and coronary arteriography is the main diagnostic technique for the diagnosis of CAE. However; other valuable non invasive tools have been proposed like Magnetic Resonance Angiography (MRA) and Computed Tomography (CT) scan, before going to the invasive coronary arteriography. Such modalities proved their usefulness in demonstrating the presence and the extent of CAE.⁽⁹⁻¹¹⁾ in addition to allow a great accuracy in the diagnosis of atherosclerosis and stenosis in those vessels although there is no universal agreement regarding that.

Ectasia is classified according to the extent of involvement of the coronary vessels, with type I representing diffuse ectasia of two or more major vessels; type II diffuse ectasia in one vessel and

localized disease in another; type III diffuse ectasia of one vessel only and type IV localized involvement (Markis *et al*).⁽¹⁴⁾

The clinical importance of CAE should be stressed on as it may cause Acute Coronary Syndrome including acute myocardial infarction even without associated stenotic lesions so there is growing body of the literature which suggests that ectasia is not an innocent condition, but a risk factor for accelerated atherosclerosis and acute myocardial infarction as ecstatic vessels appear to be prone, beside thrombus formation and dissection, to spasm despite the fact that vascular medial damage was seen in histology.⁽²⁾

The frequency of CAE in our study was 2.8%, and although it is within the wide range reported in other angiographic studies, it is relatively lower than the ratios found in these studies, for example; Sharma *et al* reported a frequency of about 10% and Swaye *et al* reported a frequency of 4.9%. Nevertheless, others reported a lower frequency than what was obtained in our Study, for example; Hartnell *et al* reported an overall frequency of 1.4% and Lam *et al* showed even a lower frequency of CAE (only 1.2%).^(3,15-18)

CAE certainly appears to be more common in males than in females in our study, which is similar to other reports.⁽¹⁹⁻²¹⁾ This may reflect the selectivity and prejudice of female referrals for cardiac catheterization and coronary angiography.

The incidence of CAE is probably higher than the percentage found in this study, because the study included only symptomatic individuals with chest pain subjected to diagnostic coronary angiograms, while asymptomatic people with CAE remain undiagnosed as is a descriptive, and a retrospective review study.

The variable frequency of CAE can be explained partly by geographical and racial differences, for example; Sharma *et al* reported a higher This is a descriptive, and a retrospective non-randomized review study of CAE in Indian people with coronary artery disease, and Lam *et al* documented a variation in the frequency of ectasia among Chinese, Malays and Indians.^(15,18)

Besides, few reports attributed the high frequency of CAE in certain specific areas to the high exposure to certain chemicals like pesticides.⁽²²⁾ and fluorosis.⁽²³⁾ Our angiographic results were consistent with what was reported in the medical literature^(3,21,24) where the right coronary artery (RCA) is the most commonly ectatic vessel found

while the Left Main Artery (LMA) is the least commonly affected.

However, in one report the distribution of ectasia in different coronary arteries did not confirm with the pattern reported in the medical literature where coronary ectasia was most frequently observed in the Left Anterior Descending (LAD) artery.⁽²⁵⁾

Diffuse pattern CAE was found in 61.4% of cases, and involvement of all coronary arteries was present in 19.3% of medical records which is relatively high. This raises the question of the progressive nature of the disease and people with a single vessel and focal ectasia, if restudied later, will have all coronaries and diffuse ectasia or not.

CAE was associated with coronary atherosclerosis in more than the half of our patients, which was in agreement with the statement that coronary ectasia is a form or a variant of Coronary Artery Disease.⁽²⁶⁻²⁹⁾

Literature is unclear with regard to prognosis of this condition. In some reports the long term prognosis of patients with isolated CAE was no better than in individuals with isolated obstructive coronary artery disease.⁽³⁰⁻³³⁾

Another unanswered question is about the treatment of CAE; the use of warfarin, aspirin, diltiazem and beta blockers have been suggested in the literature.

However, the supporting literature is scant, with many recommendations based on anecdotal evidence.

Finally, the authors recommend that recognition of CAE at angiography is essential in order to plan proper follow-up and appropriate medical therapy as we realize its exact clinical consequences and plan the precise timing of therapeutic measures application to prevent acute coronary syndrome and myocardial infarction.

Limitations for this Study

The study was based on review of angiograms reports and not on reviewing the angiograms per se, which seems to be more realistic. However, the angiograms reporter in this study is a senior consultant cardiologist who is absolutely aware of the definition of coronary ectasia reporting.

There was underreporting of CAE in the study, because it was designed to study only symptomatic patients.

The authors could not show the etiology or the conditions associated with CAE in the included patients, because in this retrospective review study,

the medical files were deficient in that regard.

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