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# Triple Vessel Coronary Artery Disease in Young Female

Ali Razaghani MD[1] and Hafeez-Ul-Hassanvirk MD[2]

[1] Thomas Jefferson University Hospital, Icahn School of Medicine at Mount Sinai/Saint Lukes Roosevelt Hospital Center Program

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## Abstract

Although coronary heart disease (CHD) primarily occurs in patients over the age of 40, younger men and women can be involved. Majority of studies have used an age cut-off of 40 to 45 years to define "young" patients with CHD or acute myocardial infarction (MI). The same age definition will be used in this article. The prevalence of CHD in younger subjects is difficult to establish accurately since it is frequently a silent process. Acute Myocardial infarction in young females is an uncommon occurrence and even if we see cases, very few of them have shown to have greater than one vessel coronary artery disease. When a young female present with acute MI, the presentation is very vague and can be easily missed so, presence or absence of cardiovascular risk factors regardless of age should be the key factor in making a decision to perform coronary angiography and full cardiovascular workup. We report here 31 year old female with multiple cardiovascular risk factors who presented with an atypical chest pain with normal EKG in emergency room and was ultimately diagnosed with triple vessel coronary artery disease. In this paper we will describe a case to describe the importance of early coronary angiography and cardiovascular workup in presence of significant risk factors despite atypical presentation and younger age of patient.

***Index terms—***

## 1 Triple Vessel Coronary Artery Disease in Young Female

Ali Razaghani ? & Hafeez-Ul-Hassanvirk ? I.

Background lthough coronary heart disease (CHD) primarily occurs in patients over the age of 40, younger men and women can be involved . Majority of studies have used an age cut-off of 40 to 45 years to define "young " patients with CHD or acute myocardial infarction (MI). The same age definition will be used in this article.

The prevalence of CHD in younger subjects is difficult to establish accurately since it is frequently a silent process.

Acute Myocardial infarction in young females is an uncommon occurrence and even i f we see cases, very few of them have shown to have greater than one vessel coronary artery disease. When a young female present with acute MI, the presentation is very vague and can be easily missed so, presence or absence of cardiovascular ri sk factors regardless of age should be the key factor in making a decision t o perform coronary angiography and full cardiovascular workup. We report here 31 year old female with multiple cardiovascular risk factors who presented with an atypical chest pain with normal EKG in emergency room and was ultimately diagnosed with triple vessel coronary artery disease. In this paper we will describe a case to describe the importance of early c oronary angiography and cardiovascular workup in presence of significant risk factors despite atypical presentation and younger age of patient.

# 2 Conclusion:

II. e-mails: alighani152@gmail.com, hafeezvirkmd@gmail.com She al so had shortness of breath for couple of months on exertion. She has been recently using two pillows for sleep. She used to walk 4 blocks before getting short of breath (for years) but recently her exercise tolerance has decreased to half a block. She denies any palpitations, any previous history of such pain. Due to thi s pain, she went to the PMD who called 911 and sent her to ED.

# 3 Case Report

# 4 III.

# 5 ED Course

By EMS, she received Aspirin 162mg po once. She received tylenol 650mg po once in ED. AV and Aortic Root: The Doppler (color and spectral) study shows trivial aortic regurgitation.

# 6 ED VS: afebrile

Tricuspid Valve: The Doppler (color and spectral) study shows trivial tricuspid regurgitation. As assessed from the tricuspid regurgitant jet, the pulmonary artery systolic pressure is normal .

pulmonic valve: Structurally normal pulmonic valve without stenosis or regurgitation.

Aortic root: Normal aortic root.

V.

# 7 Conclusions

Visually estimated left ventricular ejection fraction i s 60% .

-Echo showed 60% EF -Catheterization was done and showed 3V CAD a) Plan -start on heparin gtt, stop it 3 hrs before CABG -start metoprol ol 25mg bid po -CABG tomorrow -NPO after midnight -stop aspirin/plavix for CABG Endocrinology: #DM 2 -IDDM for 20 yrs -on insulin lantus 60U BID, 30U TID plan:

-c/w insulin #Asthma: well controlled last attack this winter family history+ There are also limited data on the frequency of MI in younger subjects. In the Framingham Heart Study, the incidence of an MI over a 10-year follow-up was12.9/1000 in men 30 to 34 years old and 5.2/1000 in women 35 to 44 years old **??**2]. The incidence of MI was eight to nine times greater in men and women aged 55 to 64 years. In other studies, 4 to 10 percent of patients with M I were ?40 or 45 years of age **??**3] **??**4] **??**5]. In two series of patients with CHD at ?40 years of age, women comprised 5.6 and 11.4 percent of patients **??**3, **??**].

Although CHD is an uncommon entity in young patients, it constitutes an important problem for the patient and the treating physician because of the devastating effect of this disease on the more active lifestyle of young patients. In addition, these patients have different risk factor profiles, clinical presentations, and prognoses than older patients. All of these factors should be taken into consideration when treating young patients with CHD VI.

# 8 Coronary Risk Factors

The relative importance of risk factors for the development of CHD according to age was evaluated in a report in which 11,016 men aged 18 to 39 years were followed for 20 years **??**7]. The relative risks associated with the traditional risk factors were of similar magnitude as in a group of 8955 men aged 40 to 59 years. These included: ? Age -relative risk 1.63 per six year increase ? Serum cholesterol -relative risk 1.92 per 40 mg/dL [1.04 mmol/L] increase ? Systolic blood pressure -relative risk 1.32 per 20 mmHg increase ? Cigarette smoking -relative ri sk 1.36 per 10 cigarette/day increase Young patients with MI usually have multiple risk factors for CHD. In some studies, for example, as many as 90 to 97 percent had one or more traditional ri sk factors for atherosclerosis **??**8] **??**9] **??**10]. In a prospective study of over 7000 women of mean age 27 years at baseline followed for an average of 31 years, there were 47 CHD deaths **??**11]. The CHD mortality rates for those with no risk factors, only one ri sk factor, or two or more ri sk factors were 0.7, 2.4, and 5.4 per 1000 person-years, respectively. A comparable relationship was seen for cardiovascular disease mortality and for all-cause mortality. (See "Overview of the ri sk equivalents and established risk factors for cardiovascular disease".) compared to 24 t o 56 percent of patients older than 45 years of age **??**6, **??**, **??**12] **??**13] **??**14] **??**15] **??**16]. (See "Cardiovascular risk of smoking and benefits of smoking cessation".)

# 9 b) Family history

Younger patients with CHD more often have a family hi story of premature CHD: 41 compared to 28 and 12 percent in middle aged or elderly patients, respectively **??**9]; and 57 versus 43 percent in two series **??**12]. A higher incidence of a positive family history in young patients (64 percent) was noted in the largest report of 823 patients **??**6].

In addition, the offspring of patients with premature CHD are more likely to have coronary ri sk factors than those without such a family history **??**17]. These include excess body weight and higher levels of serum

cholesterol, glucose, and insulin. These offspring are also more likely to have evidence of vascular disease such as endothelial dysfunction and increased carotid artery intima-media thickness **??**18].

The association between family history and premature CHD can be due to both genetic and environmental factors. Thi s was addressed in a study of 398 families in which 62 vascular biology genes were evaluated **??**19]. Missense variant s of several thrombospondin genes were significantly associated with MI and CHD.

# 10 c) Lipid abnormalities

Hypercholesterolemia is common in young patients with CHD, but its prevalence is similar to that in older patients. However, when compared t o older patients, young patients have lower mean serum high density lipoprotein (HDL) concentrations (35 versus 43 mg/dL [0.9 versus 1.1 mmol/L]) and higher serum triglycerides (239 versus 186 mg/dL [2.7 versus 2.1 mmol/L]) **??**15].

(See "HDL metabolism and approach to the patient with HDL-cholesterol levels".)

Hypertriglyceridemia was, in one series, the most common lipid abnormality in young patients with **??**I [20]. It may be associated with glucose intolerance and a predominance of small atherogenic LDL particles, both of which predispose to atherosclerosi s. (See "Approach to the patient with hypertriglyceridemia".)

# 11 d) Diabetes and hypertension

Two other important coronary ri sk factors, diabetes mellitus and hypertensi on, appear to be less common in young patients with CHD than in older patients **??**6, **??**2]. However, young patients frequently have subtle problems with glucose metabolism. In one study of 108 patients without a history of diabetes mellitus who had an MI before the age of 45, 65 percent had decreased oral glucose tolerance and a hyperinsulinemic resp onse to oral glucose challenge **??**20]. This finding is consi stent with other observations that impaired glucose tolerance in the absence of overt diabetes is a risk factor for coronary disease. (See "Prevalence of and risk factors for coronary heart disease in diabetes mellitus", section on 'CHD before diabetes'.) e) Obesity Obesity appears to be an independent ri sk factor for coronary atherosclerosis, at least in young men. Thi s was illustrated in an autopsy study of approximately 3000 persons between the ages of 15 and 34 who died from noncardiac causes **??**21]. Increasing b ody mass index was associated with both fatty streaks and raised atherosclerotic lesions in the right coronary and left anterior descending coronary arteries in young men, but not young women. The effect of obesity on other risk factors (eg, lipid abnormalities, hypertension, glucose intolerance) accounted for only about 15 percent of the relationship between obesity and coronary atherosclerosis.

How this might occur is not known, but other studies have noted an apparently independent effect of obesity as an important coronary ri sk factor. A report from the Framingham Heart Study suggested that obesity in middle-aged subjects could account for as much as 23 percent of cases of CHD in men and 15 percent in women f) Other factors A variety of other possible contributing factors have been identified in young patients with MI. These include:

? Oral contraceptive use in young women, primarily when combined with heavy smoking **??**25].

(See "Risks and side effects associated with estrogen-progestin contraceptives".) ? Frequent cocaine use, which, in the Third National Health and Nutrition Examination Survey of 10,085 adults between the ages of 18 and 45, accounted for 25 percent of nonfatal MIs **??**26].

(See "Evaluation and management of the cardiovascular c omplications of c ocaine abuse", section on 'Myocardial infarction'.) ? Smoking marijuana may be a rare trigger of MI **??**27]. (See "Cannabis use disorder: Treatment, prognosis, and long-term medical effects".) ? Factor V Leiden, which is inactivated less efficiently by activated protein C than wild-type factor V, leads to a procoagulant state by increasing thrombin generation. In a rep ort of 107 patients with premature MI but no significant coronary artery stenosis (average age 44), the prevalence of carriers for factor V Leiden was significantly higher in these patients compared to 244 with an MI and significant stenoses and 400 healthy controls (12 versus 4.5 and 5 percent) **??**28]. At least in young women, the increase in risk In the majority of patients younger than 45 years of age, angiographic studies were performed because of a hi story of MI. As expected, major differences were found when compared to older patients. h) Coronary disease severity Younger patients have a higher incidence of normal coronary arteries, mild luminal irregularities, and single vessel coronary artery disease than do older patients **??**10, **??**2, **??**3, **??**5, **??**8].

One of the largest reports of angiographic findings in young patients with CHD c omes from a substudy of the CASS trial, which compared the results of coronary angiography in 504 young men (?35 years of age) and women (?45 years of age) with a history of an MI to those in over 8300 older patients **??**12]. The following significant differences were noted:

? Normal coronary arteries were more common in the young patients (18 versus 3 percent). Young women had a higher frequency of angiographically normal coronary arteries than young men, despite a 10 age difference in the definition of "young ." ? Single vessel coronary disease was more common (38 versus 24 percent) and three vessel disease was less common (14 versus 39 percent) in younger patients.

Although some series have shown a predilection for involvement of the left anterior descending artery in young patients **??**13, **??**8] [1]

[1]  T riple Vessel Coronary Art ery Disease in Young Female


Figure 1:

? manifestation

presentation' above.)
? Younger patients have a higher
normal coronary
, this was not In another large series of 823 young patients found in the CASS substudy. with CHD, single v
family hi story of premature CHD. (See 'Family
history' above.)
? Cigarette smoking is the most common and most
modifiable risk factor in young patients.
(See 'Smoking' above.)
? Diabetes mellitus and hypertensi on appear to be
less common in young patients with CHD than in
older patients. (See 'Diabetes and hypertension' above.)

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Figure 2: