Is 20s too young to have triple coronary vessel disease?

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ABSTRACT

Introduction: Coronary artery disease (CAD) remains the leading cause of death in the US in both men and women. This is less frequent in younger population, however, when present CAD can have devastating consequences on the patient and the family.

Case Report: We reported a case of a 28-year-old smoker male with a family history of CAD who presented with dyspnea on exertion. Laboratory examinations were normal for cardiac enzymes and negative for D-Dimer. On admission ECG showed sinus rhythm at 71 bpm, RSR' in V1, S wave in I, Q wave in III, T wave inversion in III. Echocardiogram showed right ventricular systolic function reduced mid portion, preserved at apex and base (McConnell's sign) consistent with acute pulmonary embolism. Patient was started on anticoagulation. Computed tomography angiography (CTA) was also done which was negative for any acute pulmonary embolism, and anticoagulation was discontinued in the light of negative CTA. The patient was discharged from hospital with follow-up in outpatient department. However, the patient came back to emergency department with worsening dyspnea. Lab work was significant for elevated troponin I and ECG on admission showed normal sinus rhythm and S1Q3T3 pattern. Patient had coronary angiography which showed three vessel disease.

Conclusion: Smoking is conventionally recognized as the most common risk factor for heart disease. The CAD in young adults has a poor long-term prognosis. Smoking cessation remains a significant challenge in younger population. More awareness and cessation measures are required to address this emerging situation. Given lack of warning signs in these patients, physicians need to be more aggressive in managing risk factors as CAD in younger patient can have adverse outcomes.

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CASE REPORT

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worsening dyspnea. Lab work was significant for elevated troponin I and ECG on admission showed normal sinus rhythm and S1Q3T3 pattern. Patient had coronary angiography which showed three vessel disease. **Conclusion:** Smoking is conventionally recognized as the most common risk factor for heart disease. The CAD in young adults has a poor long-term prognosis. Smoking cessation remains a significant challenge in younger population. More awareness and cessation measures are required to address this emerging situation. Given lack of warning signs in these patients, physicians need to be more aggressive in managing risk factors as CAD in younger patient can have adverse outcomes.

Keywords: Acute coronary syndrome, Coronary artery disease, Vessel disease, Young population

How to cite this article

Bakhsh MU, Alkhawam H, Zaiem F, Takher J, Pareek A, El-hunjul M, Sogomonian R, Vyas N. Is 20s too young to have triple coronary vessel disease? Int J Case Rep Images 2015;6(9):583–586.

doi: 10.5348/ijcri-201595-CR-10556

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Received: 23 April 2015
Accepted: 12 June 2015
Published: 01 September 2015

INTRODUCTION

Coronary artery disease (CAD) is the leading cause of death in both men and women. In United States about 600,000 people die of heart disease every year [1]. Coronary artery disease is the most common type of heart disease, killing close to 380,000 people annually. Every year about 720,000 Americans have heart attack, out of these, 515,000 experience their first while 205,000 already had a heart attack [2]. The burden of coronary artery disease is significant; it costs \$ 108.9 billion dollars annually [3]. African American men are 30% more likely

to die from heart disease than non-Hispanic white men [4]. In men, the risk for CAD increases after age 45 while in women, the risk for CAD increases after age 55. The CAD is less frequent in younger population, however, when present this can have devastating consequences on the patient and the family. Younger men with myocardial infarction, less than 40 years old were found to be heavy smokers with a high incidence of angiographically normal coronaries. As opposed to traditional risk factors for CAD, younger patient have a lower prevalence of hypertension, diabetes mellitus and hyperlipidemia. Smoking is recognized as the most common risk factor for CAD in younger men and is associated with myocardial infarction. A positive family history of premature CAD was significantly more prevalent in younger men. The re-admission rate is high and it is associated with smoking and decreased ejection fraction.

CASE REPORT

A 28-year-old male, South Asian descent, active smoker with no prior medical history presented to the emergency department with dyspnea on exertion. Family history was significant for premature coronary arterial disease and dyslipidemia in her mother. The patient denies any recreational drug and was not on any medications.

Three months ago the patient arrived to USA and since then he had been having dyspnea on exertion, progressively getting worse. Three months ago he used to run two mile without any complaints, however soon after returning back from his country he started to get short of breath.

In the emergency department, the patient was afebrile with normotensive and stable vitals. ECG on admission showed sinus rhythm at 71 bpm, RSR' in V1, S wave in I, Q wave in III, T wave inversion in III (Figure 1)

Examination unremarkable for any murmur or lower extremity swelling. Laboratory studies revealed normal troponin I and normal CK-MB levels. His D-dimer was normal <0.150 ug/mL (0–0.223). Echocardiogram showed normal left ventricular systolic function – EF 60%, RV dilatation, right ventricular systolic function reduced mid portion, preserved at apex and base (McConnell's sign) consistent with acute pulmonary embolism. Patient was started on anticoagulation—Lovenox 1 mg/kg BID. Computed tomography angiography (CTA) was negative for any acute pulmonary embolism and anticoagulation was discontinued in the light of negative CTA. The patient was discharged with outpatient follow up with primary care clinic.

Three weeks after being discharged patient presented to the emergency department with worsening dyspnea on minimal activity, exercise tolerance limited to less than one block and one flight of stairs. Denied any chest pain, palpitations, lower extremity swelling. Patient was afebrile, normotensive and vital signs stable.

The ECG on admission showed normal sinus rhythm. S1Q3T3 pattern (Figure 2). He was given 81 mg x 4

aspirin and admitted to medicine service for further management. His lab work was significant for elevated troponin I to 0.217 ng/mL (0.00–0.10 ng/mL), however negative CK-MB. Cardiologist was consulted and patient was upgraded to CCU. His troponins I peaked to 1.884 ng/mL. Patient was started on heparin drip and eptifibatide drip for non-STEMI. Lipid panel showed cholesterol 342 mg/dL (0–200 mg/dL), triglyceride 460 mg/dL (0–150 mg/dL), HDL 25 mg/dL (23–92 mg/dL), LDL 190 mg/dL (0–100). HbA1C was 5.2%.

Given ECG findings with worsening dyspnea and elevated troponins patient had D-Dimer done which was negative (<0.150 , normal 0–0.223 ug/mL) concern for pulmonary embolism. Patient had echo done which showed normal LV function, mild MR, RV dilatation and McConnell sign seen on prior Echo was no longer seen.

Given elevated troponin with worsening dyspnea cardiology team performed coronary angiography which showed three vessel disease, minimal LV dysfunction, no MR or AS. Successful PCI of LAD/D1 and OM1. Cardiology team recommended Aspirin, Plavix with staged PCI of AV continuation.

The patient was admitted to cardiology in November 14 for staged PCI of AV continuation. The patient was discharged home with successful PCI of AV continuation, angiography further showed patent stent in LAD and OM1.

Figure 1: ECG on admission showed sinus rhythm at 71 bpm, RSR' in V1, S wave in I, Q wave in III, T wave inversion in III.

Figure 2: ECG on admission showed normal sinus rhythm. S1Q3T3 pattern.

He was discharged home on aspirin, plavix and statin. His symptoms improved after PCI and continues to follow-up with cardiology as outpatient.

DISCUSSION

Coronary artery disease remains the leading cause of death in the US in both men and women [1]. This is less frequent in younger population however when present CAD can have devastating consequences on the patient and the family [5]. Younger men with myocardial infarction, less than 40 years old were found to be heavy smokers with a high incidence of angiographically normal coronaries [6]. As opposed to traditional risk factors for CAD, younger patient have a lower prevalence of hypertension, diabetes mellitus and hyperlipidemia. Smoking is recognized as the most common risk factor for CAD in younger men and is associated with myocardial infarction [7, 8]. A positive family history of premature CAD was significantly more prevalent in younger men [9, 10, 11]. The re-admission rate is high and it is associated with smoking and decreased ejection fraction [12].

Echo done also showed McConnell sign. McConnell sign has been reported to have high sensitivity and specificity for diagnosing acute pulmonary embolism, however, recent reports have shown a poor predictive value for diagnosis of acute pulmonary embolism [13]. ECG showed S1Q3T3 which is not neither sensitive nor specific for pulmonary embolism with the most common finding being sinus tachycardia.

Stable angina and multivessel disease is uncommon in the young [14]. Younger patients denied any history of chest pain prior to MI [15]. Older patient frequently have triple vessel disease [10, 16–20]. The long-term prognosis of the patient depends upon the number of vessels involved and the degree of LV dysfunction [11, 21, 22].

CONCLUSION

Smoking and family history of premature coronary artery disease (CAD) is seen more commonly in younger patients. The CAD in young adults has a poor long-term prognosis. Smoking cessation remains a significant challenge in younger population. More awareness and cessation measures are required to address this emerging situation. Given lack of warning signs in these patients, physicians need to be more aggressive in managing risk factors as CAD in younger patient can have adverse outcomes.

Author Contributions

M. Umair Bakhsh – Substantial contributions to conception and design, Acquisition of data, Analysis

and interpretation of data, Drafting the article, Revising it critically for important intellectual content, Final approval of the version to be published

Hassan Alkhawam – Substantial contributions to conception and design, Acquisition of data, Analysis and interpretation of data, Drafting the article, Revising it critically for important intellectual content, Final approval of the version to be published

Feras Zaiem – Acquisition of data, Revising it critically for important intellectual content, Final approval of the version to be published

Jaspirt Takher– Analysis and interpretation of data, Revising it critically for important intellectual content, Final approval of the version to be published

Anirudh Pareek– Analysis and interpretation of data, Revising it critically for important intellectual content, Final approval of the version to be published

Mohammed El-Hunjul – Substantial contributions to conception and design, Acquisition of data, Revising it critically for important intellectual content, Final approval of the version to be published

Rober Sogomonian– Substantial contributions to conception and design, Acquisition of data, Revising it critically for important intellectual content, Final approval of the version to be published

Neil Vyas – Substantial contributions to conception and design, Acquisition of data, Revising it critically for important intellectual content, Final approval of the version to be published

Guarantor

The corresponding author is the guarantor of submission.

Conflict of Interest

Authors declare no conflict of interest.

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