

ST elevation myocardial infarction in a healthy teenager with no risk factors

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ABSTRACT

Myocardial infarction is not common in patients younger than 45 years. Young patients can experience a myocardial infarction in the presence or absence of atherosclerosis. We report a case of an 18-year-old male patient who presented with chest pain in the emergency department. There were neither any risk factors of coronary artery disease nor any co-morbidity. Investigations revealed an acute myocardial infarction with ST-segment elevation in ECG. On coronary angiography, mid 90% thrombus was seen in the left anterior descending artery, the cause of which remains unknown. Although rare, acute myocardial infarction should be considered in young adults or teenagers presenting with chest pain. Also, it can affect teenagers in the absence of traditional coronary risk factors or co-morbidities.

Keywords: Acute myocardial infarction, chest pain, coronary artery disease

Acute myocardial infarction (AMI) is a catastrophic disease, specifically in young age because a healthy person may die or become disabled without warning. It is a major cause of death worldwide; however, incidence is less in patients younger than 45 years [1,2]. Although rare, AMI should be considered in young adults or teenagers presenting with chest pain. In young patients, myocardial infarction (MI) may have characteristics different from those in older patients and can experience MI in the presence or absence of atherosclerosis. Despite the relatively low frequency of MI in young population, potential for death and long-term disability make this entity an important clinical problem. Better prognosis among young adults is achieved when the appropriate investigations and treatment are offered.

CASE REPORT

An 18-year-old male was brought to the emergency department 3 hours after developing chest pain. He had no

past medical or surgical history. There were no active cardiac risk factors like cigarette smoking, obesity or a sedentary lifestyle. History was inconsistent with past or present drug abuse. There was no family history of cardiac or coagulation disorders. On physical examination, he had a heart rate of 74/min, blood pressure was 120/80 mmHg, respiratory rate was 18/min, temperature and oxygen saturation on room air was normal. On systemic examination, lungs were clear and heart sounds were normal with no murmurs. Abdominal and central nervous system examination was normal.

Initial ECG showed hyper-acute anterolateral ST elevation as well as inferior ST depression (**Fig 1**). He was given a loading dose of aspirin, clopidogrel, and atorvastatin. 2D echocardiography revealed regional wall motion abnormality with moderate left ventricular dysfunction (LVEF = 35-40%). He was immediately shifted to the cath lab for angiography which revealed single vessel disease in left anterior descending (LAD) artery having mid 90% thrombus (**Fig. 2**).

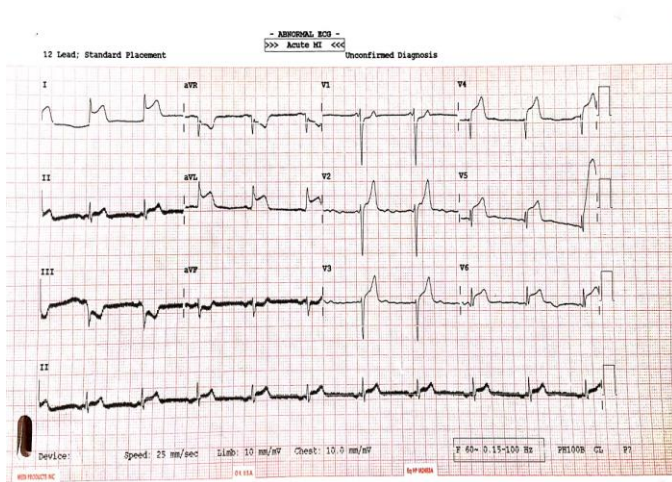


Figure 1 - ECG showed hyper-acute anterolateral ST elevation as well as inferior ST depression



Figure 2 – Coronary angiography showing single vessel disease in left anterior descending artery having mid 90% thrombus

The lesion was treated with percutaneous transluminal coronary angiography (PTCA) and stenting to LAD artery was done along with injection Aggribloc administration. There were no periprocedural complications. Post procedure ECG demonstrated partial ST segment resolution (**Fig. 3**). The patient was tested for the hypercoagulable states which were negative including Factor V Leiden mutation, antithrombin deficiency, protein C and protein S deficiency. Also levels of homocysteine, fibrinogen, Factor VIII, IX and XI were within normal range. The patient remained symptom-free and was discharged on the fourth day with advice to regular follow-up.

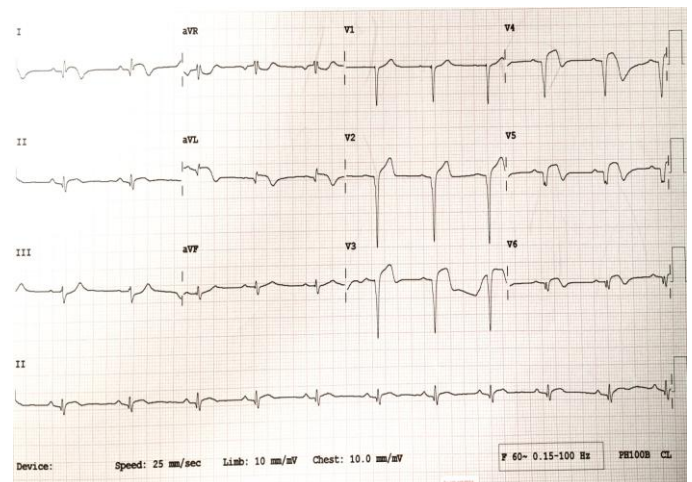


Figure 3 – Post-procedure ECG demonstrated partial ST segment resolution

DISCUSSION

Myocardial infarction is uncommon in young with only 2-6 % occurring under the age of 45 years [3]. There is a higher prevalence of non-obstructive or single vessel coronary artery disease (CAD) in young patients due to various risk factors [4]. The most significant risk factor associated with atherosclerotic CAD in young adults is cigarette smoking which was found prevalent in 92% of young CAD patients [4]. Mukherjee *et al.* found the prevalence of smoking to be higher in those less than 40 yrs of age [5]. Hypertension, diabetes mellitus, obesity, and hyperlipidemia are strongly associated with CAD in young age [6].

MI in young patients most often has angiographically normal coronary arteries and the cause of MI in these patients can be arteritis, thrombosis, embolization or spasm. Hypercoagulable states, such as protein C and protein S deficiency, antiphospholipid syndrome or nephrotic syndrome can lead to coronary thrombosis [7-10]. Coronary artery spasm can cause MI in patients with substance abuse like alcohol, cocaine, marijuana, heroin, amphetamine and inhaled butane when used alone or in combination [11]. Spontaneous coronary dissection is one of the rare causes of MI, predominantly in young women, using hormonal contraceptives during the peripartum period. In childhood, MI can be due to coronary artery aneurysm secondary to Kawasaki's disease [12,13].

In young patients, clinical presentation of AMI is often atypical. Angina is usually absent but up to 90% present with chest pain during the week before the infarct [1,14]. There are also major differences in angiographic studies with a higher incidence of normal coronary arteries, mild luminal irregularities, and single vessel coronary artery disease [15]. The incidence of the three-vessel disease is 14% in the young as opposed to 39% in the older patients [16]. However, the number of diseased vessels does not change overall mortality [5]. Prognosis is better in the younger patient with rare complications such as cardiogenic shock, stroke or life-threatening arrhythmias than their older counterparts.

Recent studies have shown a significant rise of AMI in patients less than 45 years but it seems that teenagers are also becoming a victim of this deadly disease. This case was exceptional because the patient was very young and there were apparently no known risk factors.

CONCLUSION

Our case illustrates that myocardial infarction can affect teenagers in the absence of traditional coronary risk factors or co-morbidities and it should be kept in mind in a teenager presenting with chest pain.

REFERENCES

1. Fournier JA, Sanchez A, Quero J, Fernandez-Cortacero JA, Gonzalez-Barrero A. Myocardial infarction in men aged 40 years or less: a prospective clinical-angiographic study. *Clin Cardiol.* 1996;19: 631-636.
2. Garoufalis S, Kouvaras G, Vitsias G, Perdikouris K, Markatou P, Hatzisavas J, et al. Comparison of angiographic findings, risk factors, and long-term follow-up between young and old patients with a history of myocardial infarction. *Int J Cardiol.* 1998; 67: 75-80.
3. Jalowiec DA, Hill JA. Myocardial infarction in the young and in women. *Cardiovasc Clin.* 1989; 20: 197-206.
4. Zimmerman FH, Cameron A, Fisher LD, Ng G. Myocardial infarction in young adults: angiographic characterization, risk factors and prognosis (Coronary Artery Surgery Study Registry). *J Am Coll Cardiol.* 1995; 26: 654-61.
5. Mukherjee D, Hsu A, Moliterno DJ, Lincoff AM, Goormastic M, Topol EJ. Risk factors for premature coronary artery disease and determinants of adverse outcomes after revascularization in patients < or =40 years old. *Am J Cardiol.* 2003; 92: 1465-1467.
6. Xie CB, Chan MY, Teo SG, Low AF, Tan HC, Lee CH, et al. Acute myocardial infarction in young Asian women: a comparative study of Chinese, Malay and Indian ethnic groups. *Singapore Med J.* 2011; 52: 835-839.
7. Manzar KJ, Padder FA, Conrad AR, Freeman I, Jonas EA. Acute myocardial infarction with normal coronary artery: a case report and review of literature. *Am J Med Sci.* 1997; 314: 342-345.
8. Penny WJ, Colvin BT, Brooks N. Myocardial infarction with normal coronary arteries and factor XII deficiency. *Br Heart J.* 1985; 53: 230-234.
9. Hamsten A, Norberg R, Bjorkholm M, de Faire U, Holm G. Antibodies to cardiolipin in young survivors of myocardial infarction: an association with recurrent cardiovascular events. *Lancet.* 1986; 1: 113-116.
10. Fujimura O, Gulamhusein S. Acute myocardial infarction: thrombotic complications of nephrotic syndrome. *Can J Cardiol.* 1987; 3: 267-269.
11. El Menyari AA. Drug-induced myocardial infarction secondary to coronary artery spasm in teenagers and young adults. *J Postgrad Med.* 2006; 52: 51-56.
12. Choudhury L, Marsh JD. Myocardial infarction in young patients. *Am J Med.* 1999; 107: 254-61.
13. Lee BW, Tay JS, Yip WC, Yap HK, Chan KY, Low PS. Kawasaki syndrome in Chinese children. *Ann Trop Paediatr.* 1989; 9: 147-51.
14. Schoenenberger AW, Radovanovic D, Stauffer JC, Windecker S, Urban P, Niedermaier G, et al. Acute coronary syndromes in young patients: presentation, treatment, and outcome. *Int J Cardiol.* 2011; 148: 300-304.
15. Klein LW, Agarwal JB, Herlich MB, Leary TM, Helfant RH. Prognosis of symptomatic coronary artery disease in young adults aged 40 years or less. *Am J Cardiol.* 1987; 60: 1269-72.
16. Morillas P, Bertomeu V, Pabon P, Ancillo P, Bermejo J, Fernandez C, et al. Characteristics and outcome of acute myocardial infarction in young patients. The PRIAMHO II study. *Cardiology.* 2007; 107: 217-25.

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