

Case Report

ST Elevation MI with Unknown Etiology: A Case Study

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Abstract

In this case report we investigate an unusual case of ST Elevation Myocardial Infarction (STEMI) and explore differential diagnosis. We caution cardiologists to consider alternative etiologies when presented with cases of STEMI.

Keywords: STEMI; Unknown etiology; ST elevation myocardial infarction

Case Presentation

A 68-year-old gentleman presented with symptoms of chest discomfort with the onset occurring in the early morning around 3:00 am. The patient also had a history of type 2 diabetes, hyperlipidemia, and personal history of tobacco smoking. His family history was significant for cardiovascular disease. He had been compliant with his pharmacological regimen, which included daily oral 81 mg chewable Aspirin and 40 mg Atorvastatin.

In the emergency department, initially an electrocardiogram was performed which demonstrated an evolving anterolateral ST elevation Myocardial Infarction (MI). He was taken for an urgent coronary angiography in the cardiac catheterization laboratory. The procedure revealed normal coronaries with no evidence of coronary thrombosis. It was then recommended to consider alternative etiologies such as pericarditis, myocarditis, electrolyte imbalance, illicit drug use, etc. A covid test was also performed on initial arrival in the Emergency Department (ED).

Afterwards the patient's laboratory studies (Table 1) were taken which showed elevated troponin sensitivity. His lab's data also demonstrated a leucocyte count of 5,900 hemoglobin of 13.4 g/dL, hematocrit of 44%, potassium of 4.1 mg/dL, magnesium of 2 mg/dL, and calcium of 8.8 mg/dL (Table 1).

The findings of left ventriculogram showed the left ventricular systolic functions were preserved with mildly elevated left ventricular end diastolic pressures [LVEDP of 12 mm] (Figure 1). Based on these findings other differential diagnoses were considered including viral myocarditis and pericarditis. There was no evidence of myocardial bridging, coronary AV fistula or Takotsubo syndrome.

Discussion and Conclusion

Other reports have explored ST elevations of unknown etiology and have suggested differential diagnoses such as pericarditis, myocarditis, Takotsubo cardiomyopathy, J wave syndromes such as

Brugada syndrome, early repolarization, left bundle branch blocks, left ventricular hypertrophy, hyperkalemia, hypercalcemia, drug use, and other non-ischemic causes [1]. While there are some cases of false positive STEMI, these patients have been hypothesized to differ from STEMI patients along certain axioms including patient delay [2]. One of the cases report a patient had similarly elevated cardiac markers along with retrosternal pain, but was misdiagnosed with an acute myocardial infarction [3]. In our patient we considered all of the above differentials; nonetheless no conclusive diagnosis could be performed.

An acute ST-elevation myocardial infarction generally results in myocardial tissue injury or necrosis from ischemia caused by the occlusion of one or more of the coronary arteries [4]. Therefore, in order to more accurately diagnose and assess patients suspected of STEMI, it is important to explore differential diagnoses. ST elevation can also result from non-cardiac causes. If acute coronary syndromes are ruled out, it is important to explore non-cardiac differential diagnoses such as acute pancreatitis and acute cholecystitis which can also progress to STEMI [5]. In these cases, the EKG will be normalized once the underlying condition is treated.

We recently had a 30-day follow-up, and on clinical evaluation he was hemodynamically stable. He has been compliant with his drug regimen including, Aspirin 81 mg, carvedilol 3.125 mg twice daily, lisinopril 5 mg once daily, and atorvastatin 40 mg once daily. His laboratory investigations and transthoracic echocardiogram suggested normal findings except for persistence of dyskinesia of the left ventricle. Interestingly we haven't been able to have a specific diagnosis underlying this unusual presentation of STEMI in

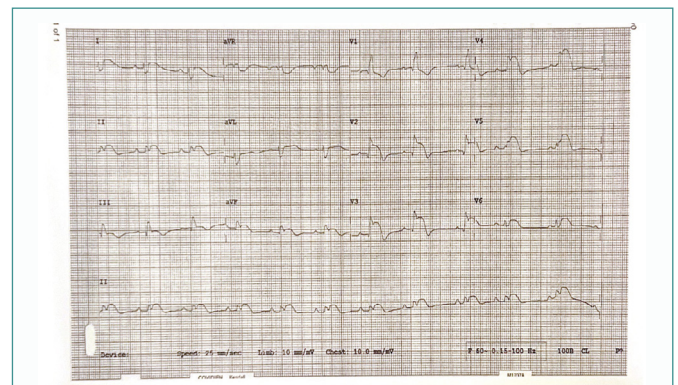


Figure 1: Angiogram results of left coronary system and right coronary artery.

Citation: Parmar V, Singh I, Duggl K, Singh S. ST Elevation MI with Unknown Etiology: A Case Study. Clin Med. 2022; 4(1): 1043.

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Publisher Name: Medtext Publications LLC

Manuscript compiled: Aug 04th, 2022

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Table 1: Laboratory results.

Order	Test	Value	Reference Range	Status	Collection
Cardiac Marker Troponin	Troponin High Sensitivity	15842CH	(≤ 75pg/mL)	Final Result	02-11-2022 13:21
CBC W/Auto DIFF	WBC, Hema	5.9	(4.8-10.8 10 ³ /uL)	Final Result	02-12-2022 13:21
CBC W/Auto DIFF	RBC, Hema	6.3H	(4.7-6.1 10 ⁶ /uL)	Final Result	2/13/2022 13:21:00
CBC W/Auto DIFF	Hemoglobin, Hema	13.4L	(14.0-18.0 g/dL)	Final Result	2/14/2022 13:21:00
CBC W/Auto DIFF	Hematocrit, Hema	44	(42%-52%)	Final Result	2/15/2022 13:21:00
CBC W/Auto DIFF	MCV	70L	(79-99 fl)	Final Result	2/16/2022 13:21:00
CBC W/Auto DIFF	MCH	21L	(27-33pg)	Final Result	2/17/2022 13:21:00
CBC W/Auto DIFF	MCHC	31L	(33-37%)	Final Result	2/18/2022 13:21:00
CBC W/Auto DIFF	Platelet	208	(130-400 10 ³ /uL)	Final Result	2/19/2022 13:21:00
CBC W/Auto DIFF	RDW	16.3H	(11.5-14.5%)	Final Result	2/20/2022 13:21:00
CBC W/Auto DIFF	Neutrophils, Auto Diff	71.6H	(41.3-69.5%)	Final Result	2/21/2022 13:21:00
CBC W/Auto DIFF	Neutrophils #, Auto Diff	4.2	(2.1-4.9 1000/mm ³)	Final Result	2/22/2022 13:21:00
CBC W/Auto DIFF	Lymphocytes, Auto Diff	16.3	(18.5-46.9%)	Final Result	2/23/2022 13:21:00
CBC W/Auto DIFF	Lymphocytes #, Auto Diff	1.0L	(1.4-2.9 1000/mm ³)	Final Result	2/24/2022 13:21:00
CBC W/Auto DIFF	Monocytes, Auto Diff	7.8	(4.2-12.4%)	Final Result	2/25/2022 13:21:00
CBC W/Auto DIFF	Monocytes #, Auto Diff	0.5	(0.2-0.9 1000/mm ³)	Final Result	2/26/2022 13:21:00
CBC W/Auto DIFF	Eosinophils, Auto Diff	3.7	(0.0-4.5%)	Final Result	2/27/2022 13:21:00
CBC W/Auto DIFF	Eosinophils #, Auto Diff	0.2	(0.0-0.3 1000/mm ³)	Final Result	2/28/2022 13:21:00
CBC W/Auto DIFF	Basophils, Auto Diffs	0.3	(0.0-2.3%)	Final Result	03-01-2022 13:21
CBC W/Auto DIFF	Basophils #, Auto Diff	0	(0.0-0.1 1000/mm ³)	Final Result	03-02-2022 13:21
CBC W/Auto DIFF	IG%	0	(%)	Final Result	03-03-2022 13:21
CBC W/Auto DIFF	IG#	0	(0.0-1.0 1000/mm ³)	Final Result	03-04-2022 13:21
CBC W/Auto DIFF	NRBC, Auto Diff	0	(%)	Final Result	03-05-2022 13:21
CBC W/Auto DIFF	NRBC #, Auto Diff	0	(1000/mm ³)	Final Result	03-06-2022 13:21
CBC W/Auto DIFF	Manuel Diff Required?	NO		Final Result	03-07-2022 13:21
Comprehensive Metabolic Panel	Sodium Blood	139	(136-145 mmol/L)	Final Result	03-08-2022 13:21
Comprehensive Metabolic Panel	Potassium	4.1	(3.5-5.1 mmol/L)	Final Result	03-09-2022 13:21
Comprehensive Metabolic Panel	Chloride	103	(98-107 mmol/L)	Final Result	03-10-2022 13:21
Comprehensive Metabolic Panel	CO2	29.9	(21.0-32.0 mmol/L)	Final Result	03-11-2022 13:21
Comprehensive Metabolic Panel	Glucose	159H	(74-106 mg/dL)	Final Result	03-12-2022 13:21
Comprehensive Metabolic Panel	BUN	19.00H	(7.00-18.00 mg/dL)	Final Result	3/13/2022 13:21:00
Comprehensive Metabolic Panel	Creatine	1.22	(0.55-1.30 mg/dL)	Final Result	3/14/2022 13:21:00
Comprehensive Metabolic Panel	Calcium	8.8	(8.4-9.7 mg/dL)	Final Result	3/15/2022 13:21:00
Comprehensive Metabolic Panel	Total Protein, Serum	7.5	(6.4-8.2 g/dL)	Final Result	3/16/2022 13:21:00
Comprehensive Metabolic Panel	Albumin	3.4L	(3.5-5.2 g/dL)	Final Result	3/17/2022 13:21:00
Comprehensive Metabolic Panel	Aspartate Transminase	114H	(15.37 U/L)	Final Result	3/18/2022 13:21:00
Comprehensive Metabolic Panel	Alanine Transminase	52	(16.0-63.0 U/L)		3/19/2022 13:21:00
Comprehensive Metabolic Panel	Alkaline Phosphatase	87	(46-116 U/L)		3/20/2022 13:21:00
Comprehensive Metabolic Panel	Total Bilirubin	0.4	(0.2-1.0 mg/dL)		3/21/2022 13:21:00
Comprehensive Metabolic Panel	Anion Gap	6L	(7-16)		3/22/2022 13:21:00
Comprehensive Metabolic Panel	eGFR	59L	(>= 60 ml/min/1.73m ²)	1^Asian	3/23/2022 13:21:00
Magnesium	Magnesium	2	(1.8-2.4 mg/dL)		3/24/2022 13:21:00
Phosphorous Serum	Phosphorus	3.1	(2.6-4.7 mg/dL)		3/25/2022 13:21:00
PROBNP	NT-ProBNP	3653H	(0-125 pg/mL)		3/26/2022 13:21:00
PT/PTT	PT	12.9	(12.1-14.7 seconds)		3/27/2022 13:21:00
PT/PTT	INR	0.9	(0.9-1.1)		3/28/2022 13:21:00
PT/PTT	PTT	30	(23-37 seconds)		3/29/2022 13:21:00

Electrocardiogram (EKG).

We recommend further research in this area as all of the differentials explored in the available scientific literature were inconclusive.

References

- de Blik EC. ST elevation: differential diagnosis and caveats. A comprehensive review to help distinguish ST elevation myocardial infarction from nonischemic etiologies of ST elevation. *Turk J Emerg Med.* 2018;18(1):1-10.
- Groot HE, Wieringa WG, Mahmoud KD, Lexis CPH, Hiemstra B, van der Harst P, et al. Characteristics of patients with false- ST-segment elevation myocardial infarction diagnoses. *Eur Heart J Acute Cardiovasc Care.* 2016;5(4):339-46.
- Zhang T, Miao W, Wang S, Wei M, Su G, Li Z. Acute myocarditis mimicking ST-elevation myocardial infarction: A case report and review of the literature. *Exp Ther Med.* 2015;10(2):459-64.
- Akbar H, Foth C, Kahloon RA, Mountfort S. Acute ST elevation myocardial infarction. In: Statpearls Publishing. 2022.
- Sethi P, Murtaza G, Sharma A, Paul T. ST segment elevation with normal coronaries. *Case Rep Med.* 2016;2016:3132654.