

Atrial Flutter Masquerading as ST Elevation Acute Myocardial Infarction

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ABSTRACT/BACKGROUND

Atrial Flutter (AF) is a common arrhythmia in emergency room. However, rarely AF waves can cause diagnostic challenge by producing ST segment abnormality. Masquerading ST segment elevation and resultant diagnosis of ST elevation myocardial infarction (STEMI) leads to unnecessarily diagnostic and therapeutic intervention.

Keywords: Atrial Flutter (AF); ST segment; Electrocardiogram

ABBREVIATIONS

AF – Atrial Flutter

STEMI – ST elevation myocardial infarction

ECG / EKG – Electrocardiogram

PCI – Percutaneous coronary intervention

EF – Ejection fraction

IV – Intravenous

DC – Direct current

CASE PRESENTATION

A 83-year old man with a past history of diabetes mellitus, renal disease and past history of coronary artery disease, (had PCI 15 years ago), asymptomatic, presented to the emergency room with history of sudden onset palpitation while he went for evening walk. It was associated with some burning sensation in the chest, and irritation in the throat. The emergency room electrocardiogram (ECG) was abnormal as shown in **Figure 1**. Initial diagnostic work up included besides ECG, Troponin-T, cardiac enzymes and electrolytes which were all within normal. Echocardiogram revealed mild global hypokinesia with ejection fraction (EF) was 50%.

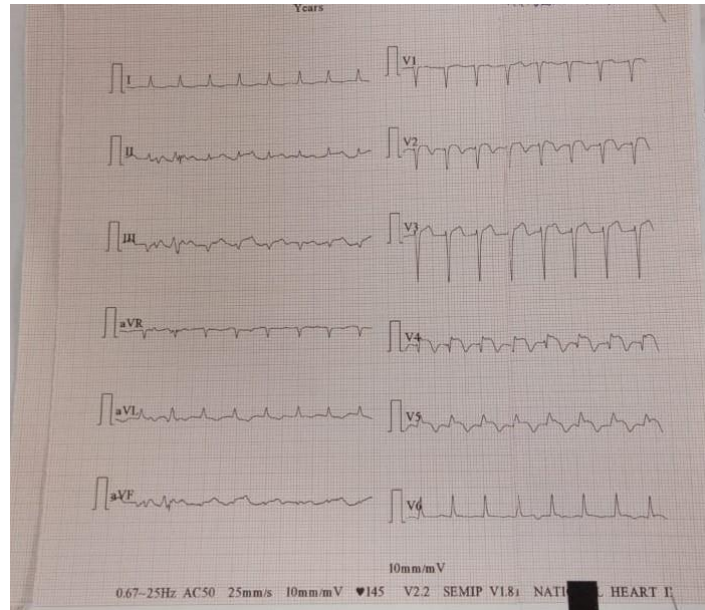


Figure 1

The patient was hemodynamically stable with pulse rate of 142/min, regular, blood pressure was 106/80 mm Hg. The cardiovascular system and pulmonary systemic examinations were unremarkable. Initial diagnosis of acute myocardial infarction was made based on EKG. However, in view of tachycardia patient was given Intravenous Metoprolol 5 mg. There was no change in the rate or rhythm following IV Metoprolol. Careful inspection of ECG gave a suspicion of atrial flutter with 2:1 block. ECG was recorded at 50 mm/sec speed to clearly demonstrate flutter wave (Figure 2), which showed flutter wave with 2:1 block.

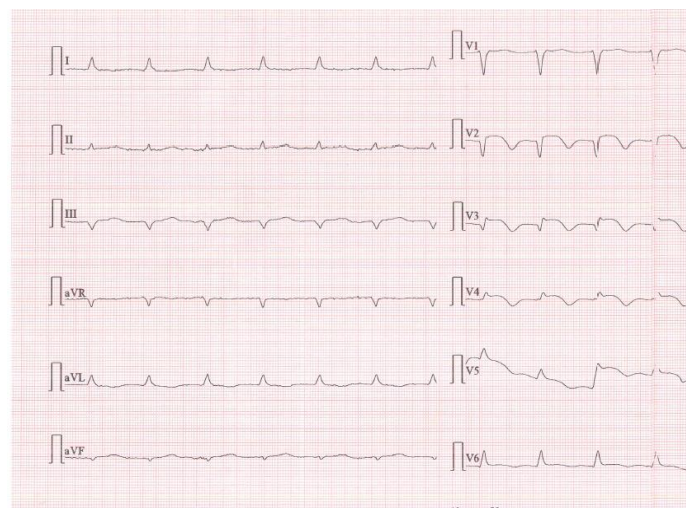


Figure 2

Though the patient was hemodynamically stable, but he had unbearable symptoms of palpitation, so it was decided to cardiovert the patient. After obtaining formal consent and IV Midazolam, cardioversion was performed with 250 J of Biphasic synchronized Direct Current (DC) shock. Soon after cardioversion, the rhythm reverted to sinus with clearly discernible P wave and QRS and his ECG reverted to the same old findings, which was there 2 years ago (Figure 3).

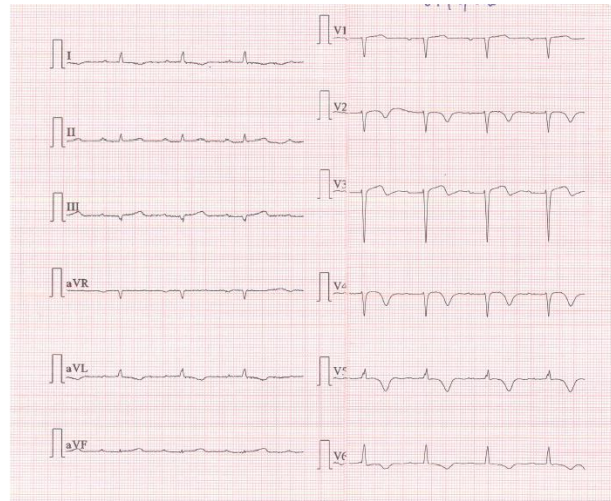


Figure 3

AF is a macro entrant, usually right atrial tachycardia whereby in its most common (>80%) and typical form the electrical impulse travel around the right atrium in a counter-clockwise rotation within the arrhythmia circuit, ascending from interatrial septum and descending via the crista terminalis before it passes through the cavo-tricuspid isthmus producing the saw tooth appearance of flutter wave in inferior leads (II, III, & aVF). When the same right atrial circuit is reversed (clockwise atrial flutter), predominately positive flutter waves are seen in inferior leads. In both the case, atrial flutter is amenable to catheter ablation of cavotricuspid isthmus with high success rate (>90%) ^[1]

Atrial flutter masquerading ST segment elevation and acute myocardial infarction has been reported. During rapid heart rate, any tachycardia can produce ischemic or non-ischemic ST depression due to subendocardial ischemia or occasionally ST segment elevation due to epicardial ischemia, caused by the rapid rate in those with underlying ischemic heart disease ^[2,3].

Flutter wave may be partly hidden in early ST segment and are best seen in inferior leads & lead V1. The prominent flutter wave distorts the ST segment may masquerade as inferior or anterior wall myocardial infarction. However, the lack of reciprocal ST changes (ST segment depression) in the precordial leads & absence of P wave and presence of flutter wave in high-speed EKG helps in establishing the diagnosis ^[4].

CONCLUSION

Atrial flutter is a common arrhythmia, masquerading as ST elevation myocardial infarction may lead to wrong diagnosis and unnecessarily intervention. Physicians need to view electrocardiogram critically to establish the proper diagnosis and avoiding unnecessarily intervention.

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