

Arrhythmogenic anterior myocardial infarction with QRS-complex fragmentations and Passing phenomenon or Yasser's phenomenon; the risk and serious implications

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Abstract

Rationale: The arrhythmias associated with myocardial infarction may be serious. Increasing morbidity and mortality in myocardial infarction-induced arrhythmias will be expected. The term “fragmentation of the QRS complex” denotes the existence of high-frequency potentials (spikes) in the QRS-complex. It is either a marker for cardiac structural diseases inducing biventricular hypertrophy or any condition interfering with the normally homogeneous depolarization status inside the myocardium. An associated Passing phenomenon or “Yasser's phenomenon” may have an apparent hemodynamic impact.

Patient concerns: A 68-year-old married, housewife, Egyptian female patient presented to the physician outpatient clinic with acute chest pain and anterior myocardial infarction with QRS-complex fragmentations and Passing phenomenon or “Yasser's phenomenon”.

Diagnosis: Arrhythmogenic acute extensive anterior infarction with QRS-complex fragmentations and Passing phenomenon or Yasser's phenomenon.

Interventions: Electrocardiography, oxygenation, streptokinase intravenous infusion, echocardiography, and percutaneous transluminal coronary angioplasty.

Outcomes: Dramatic response of acute arrhythmogenic anterior ST-segment elevation myocardial infarction with QRS-complex fragmentations to streptokinase and percutaneous transluminal coronary angioplasty.

Lessons: The presence of runs of ventricular tachycardia, multiform frequent premature ventricular contractions, and QRS-complex fragmentations, elderly, female sex are prognostic factors for the severity of the disease. Dramatic clinical and electrocardiographic response signifying the role of streptokinase, fibrinolytic, and percutaneous transluminal coronary angioplasty. The presence of fragmentation of the QRS-complex may have a bidirectional impact from seriousness to complications. Passing phenomenon or “Yasser's phenomenon” should be directed at the disease progression.

Keywords: arrhythmia; anterior myocardial infarction; qrs-complex fragmentations; passing phenomenon or yasser's phenomenon; PVCs; AF

Introduction

The common arrhythmias associated with anterior myocardial infarction are supraventricular (SVT) and ventricular tachycardia (VT) [1]. Sudden

cardiac death (SCD) due to arrhythmia after myocardial infarction (MI) may be predicted and avoided in certain situations [1]. The risk of SCD due to malignant arrhythmia such as VT must be considered in patients

with structural heart disease (SHD) who have frequent premature ventricular contractions (PVCs) [2]. High-frequency PVCs have an adversely poor prognosis [3]. Multifocal PVCs are red flags and risk markers for SCD [4]. Myocardial infarction (MI) remains the leading cause of death throughout the world. Ischemic heart disease (IHD) has been a significant cause of morbidity throughout the world for decades [5]. Anterior myocardial infarction (AMI) is a common cardiac disease accompanied by remarkable mortality and morbidity. Development in diagnosis and management options have a role in favorable outcome [6]. Classification of AMI is based on ECG findings as follows [7]:

1. Anteroseptal; ST-segment elevation in leads V1- V4
2. Anteroapical (or mid-anterior); ST-segment elevation in leads V3-V4
3. Anterolateral; ST-segment elevation in leads V3- V6
4. Extensive anterior; ST-segment elevation in leads V1- V6.

Optimal treatment approaches are based on the pathophysiology of the infarct and the presence of precipitating factors (eg, chronic heart failure, metabolic diseases) [1]. The term ‘fragmentation of the QRS-complex’ or ‘fragmented QRS’ (fQRS) point to the existence of high-frequency potentials (spikes) in the QRS-complex [8]. The expression was first described in 1973 in reporting of an experimental study on canine hearts where coronary artery obstruction motivated the occurrence of fragmented electrograms as a source of reentrant activity [9]. Formerly, fQRS had already been considered a marker for SHD triggering biventricular hypertrophy [10]. The presence of fQRS can be induced by any condition interrupting with the normally homogeneous depolarisation status in the myocardium and yielding regional conduction decelerating such as ischemia, scar, fibrosis, myofiber disarray, inflammation, and microvascular abnormality [8]. Das et al. revealed that there was a good correlation between fQRS and the presence of myocardial scar in patients with ischemic heart disease (IHD) that appeared by single-photon emission tomography (SPET) [11]. The new ‘‘Passing phenomenon’’ is a transient electrocardiographic change that spontaneously reversed within a few seconds to a few minutes without any medical interventions and apparent hemodynamic impact. Reassurance is immediate therapy. The electrophysiological study is the future advised investigation [12].

Case Presentations

A 68-year-old married, housewife, Egyptian female patient presented to physician outpatient clinic (POC) with acute severe chest pain and palpitations. Profuse sweating and dyspnea were the only accompanied symptoms. She denied a history of cardiovascular diseases, the same attack, drugs, or any other special habits. Chest pain was anginal, compressible, intolerable, and progressive. Informed consent was taken.

Upon general physical examination; generally, the patient was anxious, severe sweaty, had cold extremities, with an irregular heart rate of 120 bpm, blood pressure of 130/70 mmHg, respiratory rate of 20 bpm, the temperature of 36.8 °C, and pulse oximeter of O₂ saturation of 94%. No more relevant clinical data were noted during the clinical examination. Urgent and serial ECG tracings were done in the POC. The initial ECG tracing showing an acute extensive anterior (I, aVL, and V2-V5) ST-segment elevation myocardial infarction and reciprocal ST-depression changes in leads (II, III, and aVF). There are multiple multi-formed PVCs and atrial fibrillations (AF). (**Figure 1A**). The second ECG tracing was done within 1 minute of the initial above tracing showing the same of the above tracing but there was no PVCs (Passing phenomenon or Yasser’s phenomenon) (**Figure 1B**). The third ECG tracing was done within 2 minutes of the initial above tracing showing like the initial tracing but there are QRS fragmentations in (III and aVF) leads. There are also runs of VT. (**Figure 1C**). Aspirin 4 chewable oral tablet (75 mg), clopidogrel 4 oral tablet (75 mg), O₂ inhalation was given (100%, by nasal cannula, 5L/min) were the emergency given medications in the POC before hospital referral. The third ECG tracing was done within 30 minutes of the above emergency given medications showing normalization of most of the above PVCs and QRS fragmentations. (**Figure 1D**). The patient was referred by ambulance to the nearest central hospital. She was admitted to the ICU for anginal chest pain. Arrhythmogenic acute extensive anterior infarction with QRS-complex fragmentations and Passing phenomenon or Yasser’s phenomenon was the most probable diagnosis. Pethidine HCL 100 mg given on intermittent IV doses, streptokinase IVI (1.5 million units over 60 minutes) bisoprolol oral tablet (5mg) were given in the ICU. The chest pain is still present. The patient was referred from ICU to catheterization lab center for emergency PCI. Clinical improvement and gradual electrocardiographic ST-segment (whether elevations or reciprocal ST-depressions) resolution had happened. ECG tracing was done within 10 hours of ICU admission and after giving streptokinase showing resolution of ST-segment elevation, AF of VR; 100 bpm, PVCs, and are QRS fragmentations in (III and aVF) leads (**Figure 2**). The measured random blood sugar was 145 mg/dl. The troponin test was positive (2.26 ng/L). The patient had undergone to cardiac catheter within 12 hours of presentations which showed normal left main artery, atherosclerotic totally obstructed LAD, atherosclerotic LCX with no significant lesion, and atherosclerotic dominant RCA with no significant lesion. Two DES were applied. No more workup was done. The patient was continued: aspirin tablet (75 mg, once daily), clopidogrel tablet (75 mg, once daily), bisoprolol oral tablet (5mg, once daily), warfarin tablet (3 mg, once daily; with INR adjustment), and *atorvastatin* (40 mg once daily). Future cardiovascular follow-up was advised.

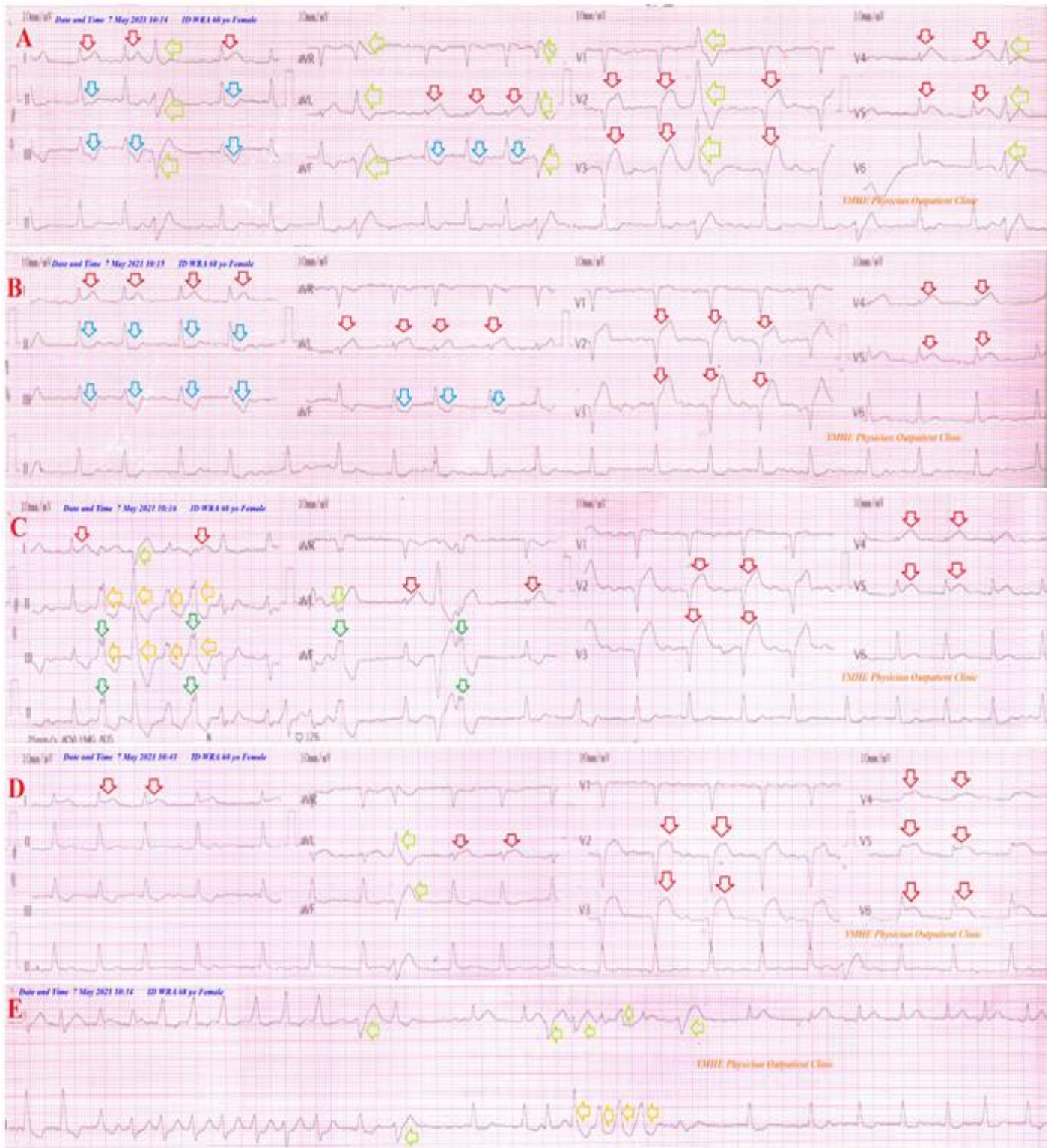


Figure 1: Serial ECG tracings; A. initial tracing was done on the POC presentation showing acute extensive anterior (I, aVL, and V2-V5; red arrows) ST-segment elevation myocardial infarction and reciprocal ST-depression changes in leads (II, III, and aVF; blue arrows). There are multiple multi-formed PVCs (lime arrows) and AF. B. tracing within 1 minute of the initial A. tracing showing of the above tracing but there are no PVCs (Passing phenomenon or Yasser’s phenomenon) C. tracing within 2 minutes of the initial tracing showing like A. tracing but there are QRS fragmentations in (III and aVF; green arrows) leads. There also runs of VT (orange arrows). D. tracing was done in the POC within 30 minutes after giving oral aspocid, oral clopidogrel, and nasal O2 set .showing normalization of most of the above PVCs and QRS fragmentations E. tracing is the initial ECG strip showing runs of VT (orange arrows) and sporadic PVCs (lime arrows).

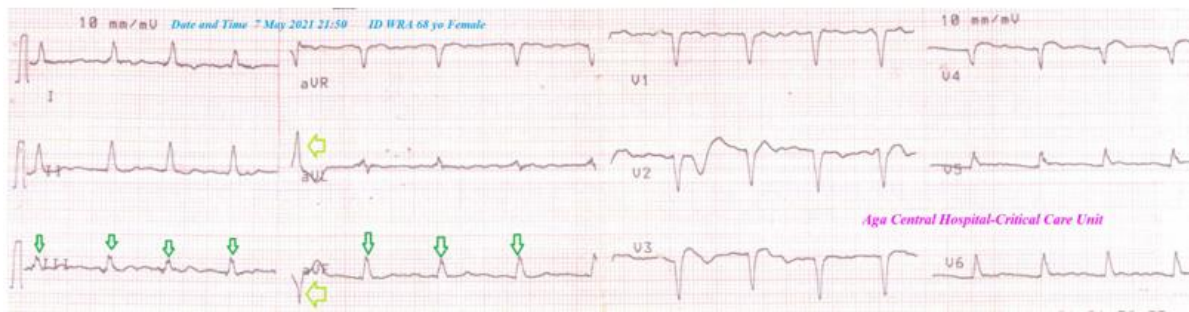


Figure 2: ECG tracing was done within 10 hours of ICU admission and after giving streptokinase showing resolution of ST-segment elevation, AF with VR; 100 bpm, PVCs (lime arrows), and are QRS fragmentations in (III and aVF; green arrows) leads.

Discussion

• Overview:

• A 68-year-old married, housewife, Egyptian female patient presented to the physician outpatient clinic with acute severe chest pain and anterior ST-segment elevation myocardial infarction (STEMI) with QRS-complex fragmentations, and Passing phenomenon or “Yasser’s phenomenon”.

• **The primary objective** for my case study was the presence of a patient who presented with acute anterior STEMI with QRS-complex fragmentations, and a Passing phenomenon or “Yasser’s phenomenon” in the POC.

• **The secondary objective** for my case study was the **question** of; How did you manage the case at home?

• There is an existence of lonely extensive acute anterior ST-segment elevation myocardial infarction.

• The presence of runs of ventricular tachycardia and multiform frequent premature ventricular contractions (PVCs) were associated with acute STEMI.

• There is the presence of fragmentation of the QRS-complex in the is considered another risk.

• Dramatic clinical ECG reversal of ST-segment deviations after streptokinase and initial emergency medications is a good prognostic sign.

• The improvement in clinical and electrocardiographic findings after PTCA and medical treatment strengthen their role in the management of the current case.

• The dramatic disappearance of the QRS-complex fragmentations and Passing phenomenon or “Yasser’s phenomenon” after giving oral aspirin, oral clopidogrel, and nasal 100 % O₂ set was the signifying their effects in the current case study.

• Massive acute pulmonary embolism (APE) is the most possible differential diagnosis for the current case study.

• I can’t compare the current case with similar conditions. There are no similar or known cases with the same management for near comparison.

• There are no known limitations of the current study.

Conclusion and Recommendations

• The presence of runs of ventricular tachycardia, multiform frequent premature ventricular contractions, and QRS-complex fragmentations, elderly, female sex are prognostic factors for the severity of the disease.

• Dramatic clinical and electrocardiographic response signifying the role of streptokinase, fibrinolytic, and percutaneous transluminal coronary angioplasty.

• The presence of fragmentation of the QRS-complex may have a bidirectional impact from seriousness to complications.

• Passing phenomenon or “Yasser’s phenomenon” should be directed at the disease progression.

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Conflicts of interest

• There are no conflicts of interest.

Abbreviations

AMI: Anterior myocardial infarction

ECG: Electrocardiogram

fQRS: Fragmented QRS

ICU: Intensive care unit

LAD: Left anterior descending

PTCI: Percutaneous transluminal coronary angioplasty

PVCs: Premature ventricular contractions

RCA: Right coronary artery

SCD: Sudden cardiac death

SHD: Structural heart diseases

STEMI: ST-segment elevation myocardial infarction

VT: Ventricular tachycardia

References

1. Granrud GA, Vatterott PJ. Arrhythmias and acute myocardial infarction. *Postgrad Med.* 1991 Nov 1;90(6):85-8, 93-96.
2. Silva AP, Merino JL. Frequent ventricular extrasystoles: significance, prognosis and treatment. *E-Journal of the ESC Council for Cardiology Practice.* 2011 Jan 28;9(17).
3. Latchamsetty R, Bogun F. Premature Ventricular Complex-induced Cardiomyopathy. *Rev Esp Cardiol.* 2016 April;69(4):365-369.

4. Elsayed YMH. Premature Ventricular Contractions from Benign to Seriousness-A Narrative Updating Review. *Archives of Emergency Medicine and Intensive Care*. 2019;2(12):1-21.
5. Bozbeyoğlu E, Aslanger E, Yıldırım Türk Ö, Şimşek B, Hünük B, Karabay CY, Kozan Ö, Değertekin M. The established electrocardiographic classification of anterior wall myocardial infarction misguides clinicians in terms of infarct location, extent and prognosis. *Ann Noninvasive Electrocardiol*. 2019 May; 24(3):e12628.
6. Bansal K, Gore M, Nalabothu P. (2021). Anterior Myocardial Infarction. [Updated 2021 Jul 22]. In: StatPearls [Internet]. Treasure Island (FL): StatPearls Publishing; 2021 Jan.
7. Thygesen K, Alpert JS, Jaffe AS, Chaitman BR, Bax JJ, Morrow DA, White HD; Executive Group on behalf of the Joint European Society of Cardiology (ESC)/American College of Cardiology (ACC)/American Heart Association (AHA)/World Heart Federation (WHF) Task Force for the Universal Definition of Myocardial Infarction. (2018). Fourth Universal Definition of Myocardial Infarction (2018). *Circulation*. 2018 Nov 13;138(20):e618-e651. Erratum in: *Circulation*. 2018 Nov 13;138(20):e652.
8. Brohet C. (2019). Fragmentation of the QRS complex: the latest electrocardiographic craze? Editorial, *Acta Cardiologica*. 2019;74(3):185-187.
9. Boineau JP, Cox JL. (1973). Slow ventricular activation in acute myocardial infarction. A source of re-entrant premature ventricular contractions. *Circulation*. 1973;48:702-713.
10. Flowers NC, Horan LG, Thomas JR, et al. (1969). The anatomic basis for high-frequency components in the electrocardiogram. *Circulation*. 1969;39:531-539.
11. Das MK, Khan B, Jacob S, et al. (2006). Significance of a fragmented QRS complex versus a Q wave in patients with coronary artery disease. *Circulation*. 2006;113:2495-2501.
12. Elsayed YMH. (2020). Electrocardiographic Passing Phenomenon (Flying Phenomenon or Yasser's Phenomenon) Conveys the Traditional Cardiovascular Management; Interpretations and Reassurance; Retrospective Observational Study. *Anaest & Sur Open Access J*. 1(3): 2020. ASOAJ.MS.ID.000515.



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