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ASHMAN PHENOMENON: AN ENIGMA IN ATRIAL FIBRILLATION

Internal Medicine

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ABSTRACT

An interesting case of atrial fibrillation is presented in this case report. The mechanism of Ashman phenomenon has been discussed. Such cases can present with a clinical dilemma.

KEYWORDS

Atrial Fibrillation, Ashman Phenomenon, Right Bundle Branch Block, Ectopic Beats

INTRODUCTION

Ashman phenomenon is an aberrancy of ventricular conduction as a result of a change in the QRS cycle length. It is typically seen in Atrial Fibrillation. However, it may also occur in other supraventricular tachyarrhythmias. First reported by Gouaux and Ashman in 1947. In atrial fibrillation, when a long cycle was followed by a relatively short cycle, they showed that a short cycle beat often had a right Bundle Branch Block (RBBB) morphology.[1]

This phenomenon may cause diagnostic confusion with premature ventricular complexes (PVCs), and a series of consecutive aberrantly conducted supraventricular impulses may be mistaken for ventricular tachycardia.[2]

Case Report

A 33 year old female presented to the Emergency department of Vinayaka Missions Medical College, Karaikal, Puducherry with complaints of vomiting 20 episodes, palpitation and breathlessness since last 2 hours. She had no past history of any significant illness.

Clinical Findings:

General Examination- She was drowsy, with mild pallor with a pulse rate of 140/minute which was irregularly irregular. Her blood pressure was 70/40 mm of Hg and was tachypneic with respiratory rate of 26 per minute, oxygen saturation of 86% at room air, Jugular Venous Pressure was raised with absent 'a' waves.

Cardiovascular System- Irregular heart sounds were present, S1 heart sound was variable in intensity.

Respiratory system- Bilateral crepitations in infrascapular region.

Investigations and Laboratory Findings:

ECG- Atrial Fibrillation with Intermittent Wide QRS Complex Tachycardia with Right Bundle Branch Block Configuration
Chest X Ray and Complete Blood Counts were normal.
Electrolytes- potassium-2 mmol/litre (3.5 to 5.5mmol/l),
sodium-125mmol/litre (135-145mmol/l).

Diagnosis and Treatment:

Cause of Atrial fibrillation was considered as Hypokalemia & in this case it presented together with Cardiogenic shock. Synchronised DC cardioversion was administered. Injection potassium chloride 40 Meq slow infusion over 5 hours was administered and treated appropriately.

DISCUSSION

Ashman Phenomenon -

Aberrant Interventricular Conduction abnormality that occurs in response to change in QRS cycle length. In Atrial Fibrillation it presents as Long R-R Interval followed by Short R-R Interval with subsequent QRS complex manifesting as RBBB pattern.

During Atrial Fibrillation, impulses of Supraventricular origin are transmitted through Ventricles during periods of relative refractoriness to impulse conduction which show Anomalous Configurations.

These “ABERRANT BEATS” mimic Ventricular Ectopic Beats & groups of beats may be mistaken for Ventricular Tachycardia.

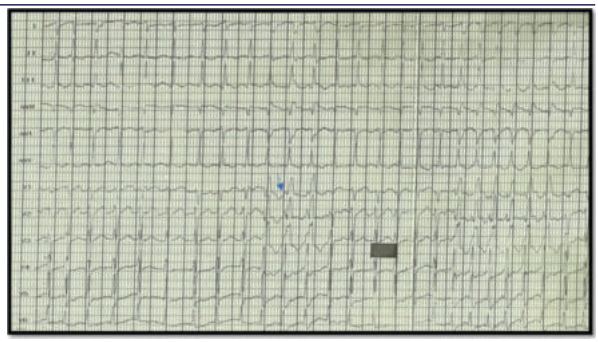

Fig1: ECG showing broad QRS complexes in between atrial fibrillation- Long RR interval followed by Short RR interval

For daily use, useful criteria to establish the diagnosis of Ashman phenomenon are those described by Fisch[3]:

1) Relatively long cycle immediately preceding the cycle terminated by the aberrant QRS complex;
2) RBBB-form aberrancy with normal orientation of the initial QRS vector, a series of wide QRS supraventricular beats is possible;
3) Irregular coupling of aberrant QRS complexes; and
4) Lack of fully compensatory pause.

It is important to understand this phenomenon because it will be useful in differentiating aberrantly conducting beat from wide complex arrhythmia of ventricular origin as their prognosis and treatment are entirely different. The treatment involves the management of the underlying cardiac condition.[4]

CONCLUSION

Diagnosing Ashman phenomenon is of utmost importance as the broad QRS complexes are commonly mistaken for ventricular ectopic beats (also known as PVCs- premature ventricular complexes). However, these are not ectopic, instead these represent aberrant conduction of supraventricular beat. The phenomenon itself is harmless but it's important not to misdiagnose these beats.

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