

Ashman phenomenon: a physiological aberration

Vivek Singla, Bhupinder Singh, Yadvinder Singh, Cholenahally Nanjappa Manjunath

Department of Cardiology,
Sri Jayadeva Institute of
Cardiovascular Sciences and
Research, Bengaluru,
Karnataka, India

Correspondence to

Dr Vivek Singla,
drviveksingla98@gmail.com

DESCRIPTION

A 24-year-old woman presented with palpitations. She had a history of rheumatic heart disease with mild mitral stenosis and moderate mitral regurgitation. ECG (figure 1) showed atrial fibrillation with aberrant conduction suggestive of 'Ashman's phenomenon'.

Ashman phenomenon, first reported in 1947 by Gouaux and Ashman,¹ is a physiological aberrancy of conduction of the ventricle as a result of a change in the QRS cycle length. Ashman beat is typically seen in atrial fibrillation when a relatively long cycle is followed by a relatively short cycle. It can also be seen in other supraventricular tachyarrhythmias. The Fisch criteria for the diagnosis of Ashman phenomenon includes—a relatively long cycle immediately preceding the cycle terminated by the aberrant QRS complex, right bundle branch block (RBBB)-form aberrancy with normal orientation of the initial QRS vector, irregular coupling of aberrant QRS complexes and lack of a fully compensatory pause.² The pathophysiology^{1 2} of Ashman phenomenon depends on the variability of relative refractory period of the conduction tissues depending upon the heart rate. The action potential duration (ie, refractory period) changes with the R–R interval of the preceding cycle. A longer cycle lengthens the ensuing refractory period, and if a shorter cycle follows, the beat

terminating the cycle is likely to be conducted with aberrancy. The RBBB pattern is more common because of the longer refractory period of the right bundle branch.

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.

Learning points

- ▶ Ashman beat is an aberrantly conducted supraventricular beat due to change in refractory period of conduction system according to the preceding cycle length.
- ▶ Ashman phenomenon can be seen in any supraventricular arrhythmia.
- ▶ It should be differentiated from ventricular premature complexes or rarely ventricular tachycardia, as the prognosis and treatment of both are entirely different.
- ▶ Most commonly Ashman beat has right bundle branch block morphology but it can have LBBB morphology also.



Figure 1 ECG showing atrial fibrillation with aberrant conduction in sixth and 14th beat (black arrows). Note the variation in cycle length (R–R duration) in the preceding beats, that is, short–long–short cycle (black star).

To cite: Singla V, Singh B, Singh Y, et al. *BMJ Case Rep* Published online: [please include Day Month Year] doi:10.1136/bcr-2013-009660

Competing interests None.

Patient consent Obtained.

Provenance and peer review Not commissioned; externally peer reviewed.

REFERENCES

- 1 Surawicz B, Knilans TK. *Chou's electrocardiography in clinical practice*. 6th edn. Philadelphia: Saunders Elsevier, 2008: chapter 17, ventricular arrhythmias; 405–39.
- 2 Lakusic N, Mahovic D, Slivnjak V. Ashman phenomenon: an often unrecognized entity in daily clinical practice. *Acta Clin Croat* 2010;49:99–100.

Copyright 2013 BMJ Publishing Group. All rights reserved. For permission to reuse any of this content visit <http://group.bmj.com/group/rights-licensing/permissions>.
BMJ Case Report Fellows may re-use this article for personal use and teaching without any further permission.

Become a Fellow of BMJ Case Reports today and you can:

- ▶ Submit as many cases as you like
- ▶ Enjoy fast sympathetic peer review and rapid publication of accepted articles
- ▶ Access all the published articles
- ▶ Re-use any of the published material for personal use and teaching without further permission

For information on Institutional Fellowships contact consortiasales@bmjgroup.com

Visit casereports.bmj.com for more articles like this and to become a Fellow