Paroxysmal Atrial Tachycardia with Block Around the Ectopic Pacemaker

Report of a Case

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SINOATRIAL BLOCK is a familiar, well-documented phenomenon. In the case presented here, an analogous type of block appeared around an ectopic atrial pacemaker in the course of paroxysmal atrial tachycardia. This appears to be the first recorded instance of its kind.

Sinoatrial block commonly occurs in one of two forms: 1, 2

1. The sinoatrial impulse fails to reach the atria for one or more cycles. The P-P interval will be an exact multiple of the normal (usually double, rarely triple or quadruple).

2. A Wenckebach phenomenon may interpose between the origin of the impulse in the sinoatrial node and its emergence into the atrial syncytium. The P-P intervals become progressively shorter until one is dropped. (The shortening of the P-P intervals is analogous to the shortening of the R-R intervals in Wenckebach block of the atrioventricular node. Each transmission from the sinoatrial pacemaker to the atria through the surrounding refractory tissue takes progressively longer. However, the amount of increase is smaller with each beat. As a result, the P-P intervals become shorter until one is blocked. This phenomenon of diminishing increment is characteristic of the Wenckebach type of conduction.)

The ectopic atrial pacemaker in the case presented here manifested both types of block within the pacemaker. The patient was a 58-year-old woman in terminal congestive failure. She had been treated with digitalis, chlorothiazide drugs, and salt restriction for some months. On admission to Natrona County Memorial Hospital it was obvious that both the aortic and mitral valves were diseased with regurgitant and stenotic lesions. The rhythm at the time of admission was paroxysmal atrial tachycardia with atrioventricular block. Serum potassium at this time was 3.5 mEq./liter; serum sodium was 130 mEq./liter. The tracing shown here was recorded shortly after admission.

Figure 1 illustrates the first type of block within the pacemaker mentioned above. The P-P interval throughout the strip is 0.25 second except for the interval indicated by the arrow, which is exactly 0.50 second. The ectopic atrial pacemaker here has “dropped” one complete cycle.

Figure 2 illustrates the Wenckebach phenomenon in block within the pacemaker. The P-P intervals are 0.29, 0.26, 0.25, and something less than 0.24. The last P-P interval cannot be measured accurately, since it is lost in the QRS, but it must be less than 0.24 second. Following the shortest P-P interval, a P wave is dropped. Both types of block occurred repeatedly during the duration of the arrhythmia.

This kind of block appears to be very rare. The writer cannot find a description of this phenomenon in the available literature, and
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Figure 1

In the interval indicated by the arrow, the ectopic atrial pacemaker has “dropped” one complete cycle. This interval (.50 second) is exactly double the P-P interval throughout the rest of the tracing (.25 second).

Figure 2

Wenckebach type of intra-pacemaker block. Beginning with the first visible P wave, the P-P interval become progressively shorter until one P wave is “dropped” (arrow). The first P-P interval of the next cycle (the last two P waves visible) is again prolonged, approximately 0.33 second.

a review of the cases of paroxysmal tachycardia in our files does not reveal a similar case. One must invoke the concept of a zone of tissue surrounding the origin of the impulse as the site within which this kind of block can appear.

Summary

A case is presented in which an ectopic atrial pacemaker manifested “pacemaker block,” a phenomenon analogous to sinoatrial block in the sinoatrial node. This is believed to be the first recorded instance of such a phenomenon.

References


Tricuspid Stenosis

Tricuspid stenosis was described as a morbid lesion by Cruwell (1765) and by Morgagni (1769) in patients observed during life and found after death to have mitral stenosis. Similar cases were reported by Corvisart (1806), Horn (1808), Allan Burns (1809), Laennec (1823), and Bertin (1824). Mitral stenosis was present in 103 out of 114 cases collected by Leudet.—Sir Humphry Davy Rolleston. The Harveian Oration. Great Britain, Cambridge University Press, 1928, p. 47.
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