Sinus and Atrial Parasystole*

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SUMMARY

A patient with both sinus and atrial parasystole is described. The literature is briefly reviewed: there are at least 6 cases which fulfil criteria for the diagnosis of concomitant sinus and atrial parasystole. Selective coronary angiography was normal in this patient; it is suggested that the syndrome may be part of degenerative disease of several parts of the conducting system of the heart.


Parasystole is a dual rhythm in which 2 pacemakers discharge independently; the parasystolic focus is protected from the impulses of the dominant, and usually faster, pacemaker. Ventricular parasystole is the commonest form of this arrhythmia, but atrioventricular (AV) nodal and atrial parasystole also occur, and Schamroth has recently drawn attention to the entity of sinus parasystole.

This report describes the electrocardiogram and His-bundle electrogram in a patient who had both sinus and atrial parasystole. The patient also had concealed conduction with second-degree block of the atrioventricular node, junctional escape beats and paroxysms of escape-capture bigeminy.

CASE REPORT

A 56-year-old woman complained of tiredness and dizziness for 3 weeks. There was no history of syncope, dyspnoea, chest pain or palpitations. She had been well before the onset of her symptoms, and she had had a vaginal hysterectomy 14 years previously. She was not receiving medicines on admission to hospital.

She was in no distress with a pulse rate of 40/min. Blood pressure was 210/100 mmHg. She was not in cardiac failure. Physical signs of heart block were present with occasional cannon 'a' waves in the jugular venous pulse, varying intensity of the first heart sound and independent atrial sounds.

The chest X-ray film showed a cardio-thoracic ratio of 0.48, a large left ventricle and a prominent aortic knuckle.

The haemoglobin concentration was 18.0 g/100 ml and the urea and electrolytes were normal (serum potassium 4.3 mEq/L).

Cardiac catheterization, coronary angiography and His-bundle electrocardiography were performed at the same time. Cardiac catheterization showed normal left ventricular function with an end-diastolic pressure of 12 mmHg and a peak LVdp/dt of 2718 mmHg/sec. Left ventriculo-

It is noteworthy that the sinus node was protected and was not reset by the atrial parasystolic beats during any phase of its cycle: this protection made the diagnosis of sinus parasystole.
Second-degree atioventricular block was also present. The first sinus beat in Fig. 1 was conducted through the AV node with a normal AH time of 70 msec. The next sinus P wave and the subsequent atrial ectopic beat were not conducted beyond the AV node and neither was followed by a His deflection on the HBE. A junctional escape beat occurred with an ‘escape time’ of 1440 msec (42 min). The junctional escape beat presumably entered the AV node retrogradely so that conduction of the following 2 sinus P waves was extinguished. The sixth sinus impulse penetrated and captured the ventricles after an interval of 1240 msec. The cycle then repeated inducing a repetitive sequence of escape-capture bigeminy due to AV nodal block.

In Fig. 2 the time relationships changed and the atrial focus did not appear after the fourth sinus P wave. This permitted the next sinus P wave (S5) to capture the atrium, it reached the AV node after 1120 msec and was conducted, so that the sequence of escape-capture bigeminy was altered and reset. S7 was not conducted as the sinus rate had again increased, so that this P wave reached the AV node after 1090 msec: the AV block appeared to be rate-dependent. Moreover, since 3 : 1 AV block is relatively uncommon, an alternative mechanism is shown in Fig. 1 by the dotted lines. These indicate concealed re-entry of the sinus beats into the AV node rendering it refractory to the succeeding P waves and suggesting a concealed Wenckebach phenomenon.

The HV time was normal (40 msec) and remained constant for every sinus and escape beat, indicating that conduction below the His bundle was normal.

A permanent internal demand pacemaker (Stanico, Cordis) was inserted on 16 June 1972. The patient’s symptoms disappeared and she is well.

**REFERENCES**