ELECTROCARDIOGRAM OF THE MONTH

Blocked Interpolated Atrial Premature Contractions Simulating Mobitz Type 2 Block. A Manifestation of Concealed Antegrade Conduction*

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Mobitz type 2 second degree A-V block with bundle-branch-block has been suggested to reflect bilateral bundle-branch disease and is usually associated with Stokes-Adams attacks.1-4 However, the identification of the nature and mechanism of second degree A-V block from the surface electrocardiogram may sometimes be difficult. Recording of His bundle electromgrams under these circumstances may be of value, since this technique allows delineation of the site of block.5 This report describes a patient in whom blocked interpolated premature atrial contractions simulated type 2 block on the surface electrocardiogram, because of antegrade concealed conduction.

CASE REPORT

A 76-year-old asymptomatic white man with arteriosclerotic heart disease was admitted to the hospital for evaluation of second degree A-V block. During a routine clinic visit, surface electrocardiograms revealed type 1 and 2 second degree A-V block with right bundle branch block (Fig 1).

His bundle (H) electrograms were recorded using previously described catheter techniques.6 Several hundred complexes were recorded. The basic rhythmic mechanism was sinus, with an atrial rate of 70-75/min. Several of the diagnosed episodes of Mobitz type 2 block were found to reflect the occurrence of blocked (proximal to H) interpolated premature atrial contractions (Fig 2). These blocked premature beats occurred during the T wave, and were not noted on the surface electrocardiogram, but were obvious on intracardiac recordings. These blocked premature atrial contractions were interpolated (unidirectional sinus block) so that sinus rhythmicity was not disturbed.7 The next spontaneously occurring sinus beat was blocked at the A-V node, due to antegrade concealed conduction from the preceding blocked atrial premature contractions.8 This simulated type 2 block (Fig 2).

In addition to the arrhythmia described above, the patient also had episodes of true type 1 and 2 second degree block proximal to the His bundle (see case 3 of Dhingra et al9). These arrhythmias were considered to be benign, and the patient was discharged, with subsequent observation. Two months later, the patient had a syncopal episode. Electrocardiograms at this time again demonstrated both type 1 and 2 second degree A-V block. Bundle of His recordings were obtained, and findings were similar to those of the first electrophysiologic study. A permanent pacemaker was implanted.

DISCUSSION

Concealed His bundle depolarizations (not visible on the surface electrocardiogram because of antegrade and retrograde block) may produce pseudo-type 2 second degree A-V block, due to retrograde concealed conduc-

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FIGURE 1. Electrocardiographic rhythm strip V₁ showing type 2 second degree A-V block and right bundle branch block; sixth P wave is blocked; P-R intervals are fixed at 0.24 sec.
tion to the A-V node. The present example of blocked interpolated atrial premature beats resembled this phenomenon. The premature blocked atrial contractions were not recognized on the surface electrocardiogram, since they occurred simultaneously with the T wave of the preceding normal beat. These blocked atrial premature contractions were followed closely by undisturbed sinus beats, the latter failing to propagate through the A-V node because of antegrade concealed conduction of the preceding blocked atrial premature beats.

The above arrhythmic mechanism could be recognizable on the surface electrocardiogram, if there were changes in T wave contour prior to the blocked P. However, correct diagnosis is unmistakable with intracardiac recordings. The occurrence of this arrhythmia as an isolated finding would not carry the malignant implications of Mobitz type 2 block distal to the His bundle.

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