This report describes the unusual finding of a non-Q wave acute myocardial infarction (AMI) complicated by permanent second-degree atrioventricular block of the Wenckebach type occurring in the distal conduction system.

CASE REPORT

A 75-year-old woman was admitted for severe retrosternal chest pain. Her past medical history revealed mild diabetes mellitus and bifascicular block (left anterior hemiblock [LAH] and incomplete right bundle-branch block [RBBB]). The electrocardiogram was compatible with a subendocardial (non-Q wave) inferior and anterolateral AMI. This was characterized by new ST-segment depression and T-wave inversion in the inferior and anterolateral leads without the appearance of pathologic Q waves or shortening of R waves (no change in QRS morphology from graphs before admission). In addition, there was a typical enzyme curve for AMI. The clinical course was complicated by atrioventricular block (described subsequently) which required the insertion of a prophylactic and then permanent cardiac pacemaker.

REVIEW

Figure 1 shows a typical example of atrioventricular block observed in this patient. We observe a 3:2 Wenckebach sequence with occasional 2:1 atrioventricular block. The first QRS beat of the sequence is conducted with a normal PR interval and a pattern of LAH and incomplete RBBB. The second beat shows a marked prolongation of the PR interval and a normal intraventricular conduction pattern.

Figure 2 shows the His bundle recording of the atrioventricular block rhythm. The first two beats conduct with an LAH and incomplete RBBB pattern. The His-ventricle (H-V) interval of the corresponding two beats increased from 55 to 127 msec; however, the following three complexes show normalization of the QRS complex.

**Figure 1.** 3:2 second-degree atrioventricular block with Wenckebach sequence. First beat is conducted with normal PR interval and bifascicular block pattern. Second beat conducts with prolonged PR interval and normal QRS morphology. Third beat is blocked; closing atrioventricular block sequence.
with gradual prolongation of the H-V interval until the next beat where the conduction to the ventricles below the His bundle deflection. The next beat conducts again with a normal H-V interval and a bifascicular block pattern closing the atrioventricular block sequence with a distal Wenckebach phenomenon.

**DISCUSSION**

This patient presented two interesting features: (1) she developed permanent atrioventricular block in the presence of a subendocardial (non-Q wave) AMI; and (2) the atrioventricular block was characterized by a Wenckebach block of the distal conduction system.

Second-degree atrioventricular block complicates an AMI in approximately 5 percent of the cases and is usually transient. The most common type of second-degree atrioventricular block is the Wenckebach type, and it occurs more frequently in inferior AMI. Less common is the Mobitz type 2 atrioventricular block, and this is usually seen during anterior AMI. The extent of infarction is greater clinically and by enzyme elevation in patients with atrioventricular block than in patients without the conduction disorder. Atioventricular block with a narrow QRS complex tends to be transient and to occur in patients with inferior AMI. Persistent atrioventricular block may be seen with anterior AMI, but these infarcts are usually large and with wide QRS morphology (bundle-branch block). Electrocadiographically, these patients show a transmural (Q-wave) infarction. The development of persistent second-degree atrioventricular block following a non-Q-wave infarction, as observed in our patient, is rather an unusual finding.

His bundle electrograms obtained during atrioventricular block in patients with AMI have demonstrated that inferior infarcts are complicated by supravisian block (atrioventricular nodal level), and anterior infarcts by infravisian block, even though some overlapping does exist. In the report by Rosen et al., one of the patients had a subendocardial AMI, and in contrast to our patient, the site of block was found to be proximal to the His bundle deflection.

A Wenckebach sequence of atrioventricular block in the distal conduction system is an unusual observation. All of the reported cases have been documented in patients with chronic conduction disease, and to the best of our knowledge, it has not been reported in AMI. This patient had, prior to the AMI, significant but incomplete conduction disease (LAH and incomplete RBBB) with the AMI damaging an already faulty system. In addition to the finding of a Wenckebach sequence of the H-V interval, we observed a normalization of the QRS complex whenever a critical H-V interval was obtained. This finding demonstrates the incomplete nature of the bifascicular block and locates the site of H-V delay to the left posterior fascicle or to the distal common His bundle area.

**REFERENCES**