Kardiologia Polska 2018; 76, 6: 1025; DOI: 10.5603/KP.2018.0125 ISSN 0022–9032

CLINICAL VIGNETTE

Atrioventricular conduction limited to accessory pathway

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We present a case of a 40-year-old man with diagnosed aortic stenosis and paroxysmal atrial fibrillation (AF). Resting electrocardiogram (ECG) (Fig. 1) revealed a sinus rhythm of 60 bpm, the duration of QRS complex was 0.16 s with a clear delta wave in several leads, and initial slurring of the R wave suggesting the preexcitation syndrome. The duration of the PR interval was 0.14 s. Another ECG examination (Fig. 2) revealed AF with mean ventricular rhythm frequency of 48 bpm; the morphology of the QRS complexes was the same as in sinus rhythm. During AF in patients with pre-excitation syndrome, fibrillation waves can be conducted to the ventricles along either the physiological pathway, the accessory pathway, or both. These three kinds of conduction pathways determine the morphological diversity of QRS complexes. QRS complexes conducted along the physiological pathway are normally shaped (no preexcitation). Ventricular depolarisation along the accessory pathway results in an extremal elongation of QRS complexes without a visible delta wave but with a slowly increasing initial phase of the QRS complex. When conduction goes along both pathways, QRS complexes contain delta waves. Depending on the extent of preexcitation, the duration, amplitude, and direction of QRS complexes may vary in different cardiac cycles. In the AF presented here (Fig. 2) there is only one morphological type of the QRS complexes. The presence of the same broad QRS configuration during AF and in normal sinus rhythm suggests conduction via an accessory atrioventricular pathway. In electrophysiological study atrioventricular conduction did not have features of conduction via atrioventricular node: (1) potential of the bundle of His was within the QRS complex; (2) there was almost no decrement in atrioventricular conduction — time from coronary sinus stimulus to QRS complex in the basic cycle length was 136 ms and in the last conducted extra beat it was 142 ms; and (3) the morphology of the conducted QRS complexes was virtually the same, despite different cycle lengths. Atrioventricular conduction was always via accessory pathway. No signs of physiological atrioventricular conduction were shown at baseline or after the infusion of isoproterenol. The patient underwent aortic valve replacement. Within two years, due to atrioventricular conduction problems, he was implanted with a DDD pacemaker. Five years after the aortic valve replacement the patient is pacemaker-dependent, without any symptoms of physiological or accessory pathway atrioventricular conduction. In conclusion: (1) misshaped QRS complexes with visible delta waves, typical for preexcitation, are observed not only when ventricles are depolarised along both physiological and accessory conduction pathways but also can be observed in a total atrioventricular block of the physiological pathway; (2) aortic valve disease may cause a block in atrioventricular conduction not only in the physiological pathway, but also in the para-Hisian accessory pathway.

Figure 1. Standard electrocardiogram obtained in sinus rhythm; abnormally wide QRS complexes with delta wave suggestive of ventricular preexcitation

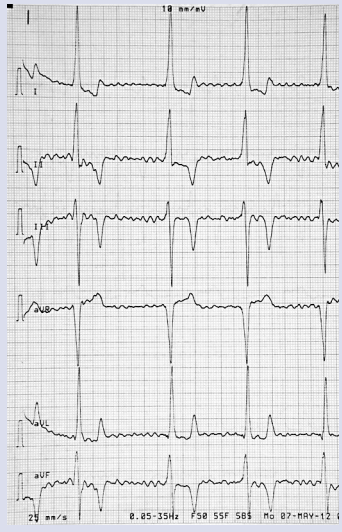

Figure 2. Standard electrocardiogram obtained during atrial fibrillation; the morphology of the QRS complexes is the same as in sinus rhythm. The presence of only one morphological type of QRS complexes may mean that atrioventricular conduction goes along the accessory pathway only

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Conflict of interest: *none declared*