

The short P-wave — Is it really short?

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An 82 year-old woman with atrial flutter and fibrillation (AF), currently in persistent AF, has undergone radiofrequency-ablation of cavo-tricuspid isthmus and electrical cardioversion to restore sinus rhythm. Electrocardiogram (ECG) after the procedure showed an unusual morphology of the P-wave, which was examined more closely. The ECGs are presented in the Figure 1.

The complete Bachmann's bundle block cannot be recognized because no negative P-wave deflection in inferior ECG leads is present, thus we assume a fusion of concomitant activation of the left atrium through the simultaneously activated Bachmann's bundle and coronary sinus. A more speculative explanation is that the depletion of left atrial cardiomyocytes is leading to a low amplitude of the terminal P wave deflection [1].

A recent population study of 285,933 individuals assessed the P-wave duration and its clinical importance. In the follow-up the authors observed the development of AF and cases of death were clearly related to a very short P-wave (< 89 ms). The intermediate, long and a very long P-wave also

increased the risk of AF and death in comparison to reference duration (90–110 ms) [2].

The standard ECG recording could contribute to such measurement inaccuracies which would be responsible for the category of 'short P-wave' and to the conclusions which are having a clinical impact on many patients. In fact, there are interatrial conduction disturbances and prolonged P-wave duration. It should be suspected, especially in the elderly with a history of atrial arrhythmia. To address the issue, we suggest a paper speed of 50 mm/s and a double gain of 0.5 mV/10 mm.

Conflict of interest: None declared

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Figure 1. Twelve-lead electrocardiogram tracings; **A.** Paper speed at 50 mm/s and enhancement $\times 16$, the P-wave duration of 112 ms, PR interval 216 ms, QRS complex duration 104 ms; **B.** Paper speed at 100 mm/s and enhancement $\times 32$, the P wave duration of 120 ms, PR interval 228 ms, QRS complex duration 102 ms; **C.** Paper speed at 200 mm/s and enhancement $\times 64$, the P-wave duration of 206 ms, PR interval 229 ms, QRS complex duration 99 ms. The vertical lines mark the beginning and the end of the P wave in each setting. The arrow presents the real end of the P wave.