Atrial Bigeminy Presenting As Slow Regular Pulse

Clinical examination of arterial pulse during a routine echocardiographic study of a patient revealed a slow regular pulse with a rate of 55 beats per minute. The electrocardiogram on the echo monitor showed atrial bigeminy with a heart rate of 110 beats per minute (Fig). The M mode examinations of aortic and mitral valve were recorded to understand the discordance between the heart rate and pulse rate. Using the M mode images as a guide, phonocardiogram was also drawn. The cycle of events can be explained as follows:

The premature atrial impulse activated the ventricle and caused premature closure of the mitral valve with resultant soft first heart sound (S1'). The premature impulse was not able to open the aortic valve and hence, there was no peripheral pulse or second sound related to it. The mitral valve opened again to be closed at the usual time by the subsequent sinus initiated impulse and lead to first heart sound of normal intensity (S1). Aortic valve opening followed with palpation of a peripheral pulse. At the end of systole, aortic valve closure occurred with second heart sound (S2) to be followed again by mitral valve opening and premature closure with soft S1'.

Hence, the present example demonstrates how a slow regular pulse can be due to presence of an atrial bigeminy. Similarly, the softer S1' due to premature atrial beat can easily be mistaken for a third heart sound in the absence of an ECG or echocardiogram.

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