U wave is flat. The U wave in lead 2 is increased in amplitude after effort; this is not abnormal.3,5

Clinical Data

The patient is a 36-year-old white man with a history of retrosternal pressure on exercise for two years, and two episodes of prolonged chest pain which were not associated with any evidence of myocardial necrosis. Physical examination was normal. Coronary arteriography was performed. The left anterior descending artery could not be filled from the left main coronary artery (Fig 3), nor from an anomalous origin in any of the sinuses of Valsalva. However, there was late retrograde filling of this vessel from the right coronary, via septal arteries and collaterals (Fig 4). This confirms complete obstruction of the left anterior descending artery at its origin from the left main coronary artery. The clinical and arteriographic evidence dovetail neatly to provide confirmation of the significance of the isolated U wave inversion after exercise. It is noteworthy that the abnormal U wave changes with effort are in proximity to the anatomic area of ischemia and demand.

References


Paroxysmal Atrial Flutter of Extremely Short Duration*

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Atrial flutter may be permanent, occurring only in diseased hearts, or paroxysmal, occurring in normal or diseased hearts.

The paroxysms of paroxysmal atrial flutter last, as a rule, for many days, weeks or months. However, there are exceptions to this rule as illustrated in the following case: A well built 40-year-old white worker complained of a "sudden sensation of palpitations." His blood pressure was 130/85 mm Hg. Clinical and x-ray examination revealed neither organic heart disease nor thyrotoxicosis. No drugs were taken during the last two years. His electrocardiogram, apart from a flattening of T wave in lead aVL, showed short paroxysms of atrial flutter with 2:1 block, lasting four (leads II and V5) to five (lead V1) seconds (Fig 1).

During the paroxysms, atrial activity in the form of "F" waves occurred regularly at a rate of from 200 to 220 per minute whereas the ventricular rate was one half that of the atrial rate i.e. 100 to 110 per min. Atrial and ventricular rates showed progressive decrease during the paroxysm reaching their lowest values by the end of it.

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Figure 3. Selected frame from a coronary cinearteriogram. Left coronary artery (LCA) injection, the circumflex artery (C) is normal. The left anterior descending artery (arrow) is absent from its expected site.

Figure 4a (upper). Early frame from a right sided injection showing normal right coronary artery (RCA) and a large diagonal branch. Figure 4b (lower). Later frame, same injection. The anterior descending artery (arrow) is seen filling retrograde.

Figure 4a (upper). Early frame from a right sided injection showing normal right coronary artery (RCA) and a large diagonal branch. Figure 4b (lower). Later frame, same injection. The anterior descending artery (arrow) is seen filling retrograde.

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The paroxysm was twice induced by an extrasystole (ES in leads II and V3); in one instance (lead V1) no extrasystole preceded the sudden appearance of "F" waves.

The patient, leading a normal life, did not return for a re-examination, although so advised. Paroxysmal atrial flutter initiated by atrial extrasystoles is not rare, but rather seldom recorded. Thus, the main reason for presenting this case is the interesting background of the "palpitations" proved electrocardiographically in an otherwise healthy person.

The Effect of Digitalis on the Exercise Electrocardiogram

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It is known that interpretation of the exercise electrocardiogram in the presence of ischemic heart disease is almost impossible when the patient is being treated with digitalis, though this fact is often not emphasized in textbooks.

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Figure 1. Standard leads of electrocardiogram when the patient was under treatment with digitalis. Left: at rest. Right: immediately after exercise. The exercise was performed on a bicycle ergometer, the work load—also in the following test—was 400 Kpm/min for one minute, followed by 600 Kpm/min for two minutes and then by 800 Kpm/min for two minutes (paper speed 50 mm/sec).

Figure 2. Precordial leads of electrocardiogram obtained at the same time as Fig 1. Left: at rest. Right: immediately after exercise (paper speed 50 mm/sec).