ELECTROCARDIOGRAM OF THE MONTH

Exercise Test and Coronary Arteriography in Minimal Angina*

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THIS 43-YEAR-OL D WHITE MAN HAD been a railroad brakeman. He was able to perform his duties with little or no discomfort, but noticed in the morning, when he went to his car to go to work, he developed mild chest pain. After the initial morning episode, he rarely had any difficulties for the rest of the day. These symptoms had been present for about four years, but in the past year he noticed these pains became more frequent and, on occasion, radiated to the left arm. There had been no episode of dyspnea, abnormal rhythm, nor had he ever noted palpitation. He usually obtained relief if he rested for three to five minutes. In the past four years, he has had several electrocardiograms, all of which have been completely normal. He has never been on nitroglycerin or long-acting nitrates. He has never had dyspnea and is able to sleep on one pillow without respiratory embarrassment. He states that he was able to walk considerable distances at a normal pace, without any angina or respiratory difficulties, but excessive effort has produced angina.

The physical examination again was essentially negative. His blood pressure was normal with an average figure of 130/72. There was no cardiomegaly. Laboratory studies proved to be negative, including SGOT and LDH. The serum cholesterol was 290 mg. per cent. A cervical spine x-ray and chest x-ray films were normal. An upper gastrointestinal series proved to be negative. Single Master exercise tolerance study was performed. It is interesting to note that during his exercise study he did not complain of any chest pain and had no dyspnea. The electrocardiogram (Fig. 1) at resting stage, immediately after, and three and six minutes after, showed the apparent marked changes. The six-minute study after exercise shows a return to the pre-exercise level. The ST segment changes were quite marked and the T wave inversions were also notable.

Selective coronary arteriography was performed on October 5, 1964. The pressures were recorded within the left ventricle and the ascending aorta. No pressure gradient was found to be present across the aortic valve and the left ventricular end diastolic pressure was normal. Both coronary arteries were satisfactorily opacified. A generalized arteriosclerotic change was seen in both coronary arteries (Fig. 2). In addition to this generalized disease just below the marginal artery, the right coronary artery presented an obstructive lesion producing at least 50 per cent reduction of the lumen of the artery. A similar obstructive lesion was present in the left coronary artery which was localized mainly to the bifurcation of the left main stem of the left coronary artery producing a reduction of the lumen caliber of the left anterior descending, left circumflex and the diagonal branch. The reduction of the lumen caliber was estimated to be between 50 to 80 per cent by Drs. Paul Novack and Hratch Kasparian at Hahnemann Hospital.

Exercise tolerance studies are well known and presentation of this case is not intended to demonstrate its use. The primary reason for this presentation is to show the rather marked changes on the exercise tolerance test in an individual who had minimal symptoms. We feel that a patient who presents any symptoms of angina, regardless

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Exercise test and coronary arteriography

Figure 1: Exercise tolerance test (single tracing).

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of how minimal these symptoms may be, should have some form of exercise tolerance study. It is noteworthy that all the electrocardiograms of this man prior to this occasion were within normal limits and no further studies were made. Consequently, for the past four years he continued to have angina which was increasing in severity. The minimal symptoms he presented and the marked change seen on coronary arteriography are noteworthy.

FIGURE 2: Left coronary artery visualization.

FIGURE 3: Right coronary artery visualization.

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Readers are invited to submit articles for the Electrocardiogram of the Month. Please submit material to Stephen R. Elek, M.D., 6423 Wilshire Boulevard, Los Angeles, California.

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CLINICAL PROFILE OF PAROXYSMAL HYPERPNEA

A large series of patients with cyanotic congenital heart disease and inadequate pulmonary blood flow who required a systemic to pulmonary artery anastomosis was reviewed, along with a small current series of patients unselected as to surgical intervention. Thirty-eight per cent of 190 patients in the first group had definite spells consisting of paroxysmal hyperpnea and increased cyanosis, frequently progressing to a loss of consciousness. In the current group, 13 of 24 had spells. In the combined groups, there were three convulsions, eight cerebral vascular accidents, and six deaths due to the spell.

Age of onset varied from one month to two years, with the peak incidence between two to three months of age. Precipitating factors, in order of over-all frequency, were crying, defecation and feeding. The most surprising finding was the lack of correlation of hyperpneic spells with resting arterial desaturation, although all arterial saturations obtained during attacks were quite low.


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LATERAL CHEST RADIOGRAPH AND THE FEV

There may be a broad relationship between the differences in the lateral roentgenograms taken on inspiration and expiration and the forced expiratory volume (F.E.V.) per cent. This confirms suggestions that the translucency of the lateral chest roentgenogram on expiration may be used as an index of the severity of airway obstruction.