Reversible Angina Pectoris

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It has been demonstrated repeatedly that not much importance can be attached to the prognostic significance of bundle branch block. Right bundle branch block has been considered to show a more favorable prognosis than left bundle branch block. However, the presence of right bundle branch block, either the typical or atypical form, alerts the physician to the presence of basic cardiac disease, particularly disease of the coronary circulation. Bundle branch block may occur transiently or it may be persistent. Generally, when bundle branch block is associated with coronary atherosclerosis, it is persistent.

The following case is reported because of the association of the presence of bundle branch block with symptoms indicative of coronary artery disease and the subsequent disappearance of symptoms and electrocardiographic abnormalities on a specific dietary regimen. Of interest are the therapeutic implications associated with the disappearance of symptoms and bundle branch block.

The patient was a 46 year old white pharmacist who presented himself on October 28, 1954 because of an increasingly severe angina pectoris syndrome. He stated that for a period of about one year, he had experienced left anterior chest pain with an accompanying sense of oppression and limitation of physical exertion. The pain usually came on while walking and was relieved by sublingual nitroglycerin pills. Being a pharmacist, he had tried a number of coronary vasodilator drugs without notable response. He presented himself with regard to limiting hours of work, diet and his tolerance seemed to be decreasing. The family history was negative for coronary artery disease.

Examination was not remarkable other than for the presence of xanthoma tuberosum lesions covering the extensor surfaces of both elbows. The ocular fundi showed some evidence of arteriolar narrowing. He was 67 inches tall and weighed 164 pounds. Blood pressure was 118/68. Heart sounds were normal and no murmur was heard. A2 was greater than P2. Examination of the lungs and abdomen was negative. An electrocardiogram showed the presence of an atypical right bundle branch block. Ballistocardiographic study revealed an abnormal pattern. Laboratory examinations were not revealing other than a cholesterol value of 345 mgm./100 cc. of blood.

Because of the presence of the xanthoma tuberosum and the elevated blood cholesterol level, he was placed on a low-fat, low-cholesterol diet along with a lipotropic regimen to be taken twice daily. When seen two months later, there was no change in symptoms or electrocardiogram findings (Fig. 1). He was following the low-fat, low-cholesterol diet and continued to follow it, despite severe restrictions upon his eating habits.

On November 7, 1955, the patient reported that he had followed the dietary regimen throughout the year. He was no longer having chest pain with effort. In addition to his usual, full-time job as a pharmacist, he was doing additional work. He now weighed 168 pounds and the physical examination was not remarkable. Blood pressure was 144/82. The blood cholesterol was 206 mgm./100 cc. of blood. Electrocardiographic examination at this time showed a completely normal pattern. The right bundle branch block was no longer present (Fig. 2). Subsequent examinations have confirmed the disappearance of symptoms and electrocardiographic abnormalities.

He has required no nitroglycerin or other medication since following the diet. There has been a moderate decrease in the size of the xanthoma tuberosum lesions of his extremities.

Etiology of Atherosclerosis

While there has not been a change in the high incidence of atherosclerosis in the United States or in the excessively high death rate...
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sclerosis, there has been a marked change in the attitude of physicians towards this disease; physicians and patients alike have assumed a hopeful outlook. Such change in attitude is due to the realization that the concept of atherosclerosis being a physiological aging process is erroneous. The present concept of the atherosclerosis problem is the realization that it is basically a metabolic disease. 

There has been a recent realization that atherosclerosis may be possibly even reversible.1 To reverse the process would result in a tremendous reduction in morbidity and mortality rates in our country and result of decreasing the incidence of atherosclerosis, the greatest of death in the middle aged and elderly.2 All investigations seem to indicate the fact that atherosclerosis is primarily a metabolic disease, particularly such metabolism as concerns the cholesterol-lipid-lipoprotein relationship in the human body. Although much of the work emphasizes the typical American diet, which is high in cholesterol, lipids and salts, is an important etiological factor in atherosclerosis, no attempt is made to incriminate diet as the only operating mechanism. Other factors in the pathogenesis of atherosclerosis are heredity, level of activity, stress, sex and other metabolic diseases such as diabetes, obesity and familial hypercholesteremia.

At trying to study why man is unique among mammals in his position to form atheromatous patches in blood vessels, attention is focused on the chemical factors. If the abnormalities of lipid metabolism associated with atherosclerosis are to be altered in the direction...

FIG. 1

FIG. 2

1: Electrocardiogram taken December 21, 1954 showing atypical right bundle branch—Wilson type. — Figure 2: Electrocardiogram taken November 7, 1955 showing a normal pattern. At this time the patient was free of chest pain.
tion of the conditions found in young women and in mammals immune from atherosclerosis, one may use the dietary approach which indicates a low-fat, low-cholesterol diet or follow Barr's approach, which has been the use of female sex hormones. While workers previously had attempted to lower serum cholesterol and to alter lipid metabolism by means of diet, the scientific stimulus in this direction resulted from the studies of Keys, who showed that an outstanding feature of all populations known to have relatively little coronary heart disease is the low consumption of fats. Experiments in man have shown that fat, and not the cholesterol content of the diet, has a strong effect on blood cholesterol. Low-fat diets have also been shown to reduce the incidence of thromboembolic disease. In Norway, during World War II, the decline in incidence in coronary artery disease mortality was paralleled by a sharp decline in thromboembolic complications after surgery. These declines in mortality and morbidity have been held to be due to the low-fat diet prevalent at the time. Another study which indicated a relationship between plasma lipids and coronary atherosclerosis was that of Enos, who reported on American soldiers killed in Korea. Gertler's studies also indicated a causal relationship between atherosclerosis and elevated serum cholesterol. Confirmation of this study is seen in the studies of H. Steiner, who also noted that the high cholesterol level in patients with atherosclerosis fluctuated widely in contrast to the consistently low levels in controls. Autopsy studies which reveal a higher incidence of severe atherosclerosis in obese people, confirm the metabolic origin of such atherosclerosis.

As a result of these considerations, clinicians have treated patients with atherosclerosis or tendency towards such conditions with low-fat diets. While attempts have been made in that direction, achieving a low-cholesterol diet is more difficult and of less value than a low-fat diet. Most of the body cholesterol consists of a mixture of exogenous or dietary cholesterol and endogenous cholesterol of hepatic origin. Several workers have reported relief of angina pectoris with fat restriction in diet, while others have produced angina pectoris with high fat feedings.

**Significance of Bundle Branch Block**

One of the first articles to stress the benign nature of atypical right bundle branch block appeared in 1934 and described five cases of atypical right bundle branch block, four of whom had no cardiac symptoms, the electrocardiograms remained unchanged over many years with the patients continuing asymptomatic. There was little or no evidence of cardiovascular disease on routine physical examination. In considering the etiology of bundle branch block, arteriosclerotic heart disease is the common etiological type. In a study of 452 cases of bundle branch block either right or left, 31 were examples of benign bundle branch block and these were usually right; the bundle branch block was considered benign when it existed without evidence of organic heart disease. The benign type of bundle branch block was thought to be due to benign intercurrent infections. When there is coronary artery disease, the prognosis with
right bundle branch block is better than with left bundle branch block. Frequently, either condition is compatible with a long and useful life. Wolfran\textsuperscript{17} also reported a considerable percentage of cases of bundle branch block unassociated with clinical heart disease; most of the blocks were of right bundle branch type. There are reported instances of benign bundle branch block in the same family.\textsuperscript{18}

In contrast to instances of permanent bundle branch block, there have been a number of reports of transient bundle branch block. Transient bundle branch block due to myocardial changes secondary to heart failure has been reported\textsuperscript{19} and other workers have reported transitory bundle branch block both in the presence and absence of organic heart disease.\textsuperscript{20} Bishop\textsuperscript{21} followed a case for nine years following an episode of transient left bundle branch block. Master reported the presence of transient bundle branch block during an attack of angina pectoris and he suggested that even with septal infarction, bundle branch block may be transitory until collateral circulation has taken place.\textsuperscript{22} Kalett\textsuperscript{23} reported a case of left bundle branch block which existed for four years following coronary occlusion and then disappeared spontaneously, the patient remaining symptom-free. This was unusual in that once established, such block is generally permanent.

COMMENT

While the exact pathogenesis has not been elucidated, recent studies indicate a close connection between the deposition of cholesterol within the lumen of coronary arteries and the process of atherosclerosis. What effect blood cholesterol levels have upon the deposition of cholesterol within the intima of coronary arteries and whether this process can be influenced by exogenous cholesterol is debatable. However, it is well known that lowering blood cholesterol levels by means of dietary restriction of fats, frequently causes xanthomatous skin lesions to decrease in size. While atheromatous lesions within the intima of arteries need not respond in the exact manner, there should be a similar effect.

The relief of angina pectoris is generally presumed to be related to improved collateral circulation.\textsuperscript{5}

In the particular instance herein reported, the association between blood cholesterol levels, electrocardiographic changes indicating cardiac abnormalities and the anginal symptoms cannot be disregarded. While the relief of anginal symptoms and the reversion of the pattern of bundle branch block may have been coincidental, the close association of these factors together with a reduction in blood cholesterol and the decrease in size of xanthoma tuberosum lesions achieved by means of reduction in exogenous cholesterol and fats, would indicate a common etiological factor. In view of recent experimental studies associating atherosclerosis with cholesterol metabolism, this one case may be a lucid demonstration of such association.

REFERENCES