SUMMARY OF CURRENT THERapy

The Treatment of Angina Pectoris

DAVID W. IRVING, M.D.,* AND E.L.T. HARDING, M.B., CH.B.**

London, England

Angina pectoris is a symptom of myocardial ischemia and is due to a discrepancy between the myocardial demands for, and the supply of, oxygen. It is exceptionally common and causes considerable disability. Angina pectoris is most common in men, usually making its appearance after the age of 35.

In few diseases is the diagnosis made solely on the history obtained from the patient as it is in the case of angina pectoris. The physical examination rarely yields anything of benefit in making or even substantiating the diagnosis. Classically, the attack is provoked by either exertion or an unexpected emotional stress. Activities such as climbing stairs, walking briskly, shovelling snow, eating a heavy meal, walking against a stiff wind or extreme cold may precipitate an attack. The pain is usually relieved within a minute or two of stopping the effort. Anginal pain is described as a constricting, choking, burning, tightening, or a feeling of heaviness in the retrosternal region. It is not typically precordial and pain in the apical region is rarely myocardial. It frequently radiates down the left arm, occasionally the right, and into the neck and jaw, especially if there is dental caries.

TREATMENT

An essential part of the management of a patient with angina pectoris is complete reassurance by the physician. The mechanism of the production of pain should be explained to him, as an intelligent understanding of the disease enables him to limit his activities accordingly and thus prevent the pain. Under no circumstances should the patient be frightened by the seriousness of his condition. The temperament of each patient must be taken into consideration during such an explanation.

Anemia, obesity and hyperthyroidism must be treated to remove unnecessary burdens on the heart. Angina in pre-menopausal women should make the physician search for diabetes.

A. Sedation

When patients first present with the history of attacks of angina pectoris, the measures described above must be carried out, i.e., reassurance and explanation. Mild sedation can then be resorted to, often with extremely gratifying results. Sodium phenobarbital, 0.5-1.0 gr., or sodium amy- tal, 0.25 - 0.5 gr., three or four times a day, are useful. Such sedation does much to allay anxiety and apprehension on the patient’s part and serves to “slow him down” to an extent that exertional causes of angina are decreased. Tranquilizing agents, by producing a state of euphoria, often help to reduce the frequency and severity of attacks of angina due to emotional stress.

B. Vasodilator Drugs

(1) Nitrites: The nitrites remain the mainstay in the treatment of angina, nitroglycerine being the preferred drug. Nitroglycerin tablets of 1/100 gr. (0.60 mg.) are often effective in the prevention and treatment of attacks. They should be chewed, but can also be dissolved under the

*Postgraduate Medical School, Research Fellow, National Heart Foundation of Canada. Presently at University of Alberta Hospital, Edmonton.
**Wellington, New Zealand.
tongue and relief is usually obtained within two to three minutes. It is important that the drug be used immediately the pain commences, and prophylactically when any exertion or excitement is anticipated. The patient soon learns what activities cause chest pain and he then takes his tablet prior to the exertion. No limit should be placed on the number of tablets a patient can take in a day, but care should be taken that the patient is taking and using them in the correct manner.

The mechanism of action of nitroglycerine is unknown. Few investigators have found an increase in the myocardial blood flow following its use. Possibly the drug plays some part in altering the metabolic demands of the heart.

Long-acting nitrates such as pentaerythritol-tetranitrite in a dose of 10-30 mgs., three to four times a day may be effective in the prophylactic treatment of angina. They should be taken at constant times during the day and before meals. Their use is usually disappointing, but they may be worth a trial.

(2) Amyl nitrite: Amyl nitrite is quick acting, but is less convenient and has more side effects than nitroglycerine. A glass ampule is crushed in a handkerchief and the contents inhaled. Headache and dizziness are frequent side effects due to “nitrite hypotension.”

(3) Aminophylline: Aminophylline is seldom used, but may relieve attacks of angina in a dose of 0.1-0.2 gms. three times a day. It appears to be most useful during severe and prolonged attacks. Because of producing nausea it is often combined in a tablet with aluminum hydroxide.

(4) Persantin: There are recent reports of Persantin, a pyrimido-pyrimidine derivative, being a useful coronary vasodilator. It is claimed to increase effort tolerance and reduce the severity and frequency of anginal attacks. It should be used as a supplement to nitroglycerine and not as a replacement. Side effects are uncommon, but include headache, dizziness and weakness. Fifty - 150 mg. in divided doses before meals is usually a satisfactory dose. Further trials will be necessary to completely evaluate this drug.

C. Monoamine Oxidase Inhibitors:
In some cases of severe intractable angina pectoris, especially those associated with anxiety and/or depressional states, monoamine oxidase inhibitors (Marplan, Nardil etc.) may be useful in controlling pain. A dose of 30 mg. of Marplan a day usually exerts its effect in one to four weeks, when the dose can be reduced to 10-20 mg. a day. They may be used together with nitroglycerine. The patient should be kept under close supervision. The feeling of well-being and absence of painful sensations produced by these agents may make the patient exceed his coronary reserve. Although toxicity is low in the newer forms of this group of drugs, side effects are not uncommon and include orthostatic hypotension, jitteriness and insomnia. The mode of action of these drugs is as yet uncertain, but they are thought to inhibit the enzyme destroying the amines serotonin and norepinephrine, thereby prolonging the effects of these substances on the brain, heart and other structures. This results in a feeling of euphoria and an increase in the pain threshold.

D. Antiarrhythmic Drugs:
Antiarrhythmic drugs are beneficial when attacks of angina are provoked by a rapid arrhythmia. It is well recognized that rapid tachycardias and premature systoles can provoke anginal attacks in susceptible patients. Agents which slow the ventricular rate or convert the arrhythmia to sinus rhythm stop angina by increasing diastolic filling of the coronary arteries. Conversion or slowing of the rate also decreases the myocardial oxygen demands.

E. Antithyroid Drugs:
The production of hypothyroidism was advocated to reduce the circulatory demands and thereby benefit patients with angina and congestive heart failure. The end result can be achieved by surgery, antithyroid drugs or radioactive iodine. Radioactive iodine is the method of choice be-
cause of the ease and simplicity involved. It is given in three divided doses of 10 milligrams each at weekly intervals. Should hypothyroidism be produced, it can be treated with small doses of thyroid extract. A high serum cholesterol level which often occurs can be managed by a low fat diet or hypocholesterolemic drugs.

F. Hypocholesterolemic Drugs:
When hypercholesterolemia is present, it may be worthwhile to reduce the serum cholesterol level with certain agents, by restricting hydrogenated fats and adding unsaturated fatty acids to the diet. The rationale behind this therapy is the relationship of abnormal serum lipoproteins with coronary artery disease. Hypocholesterolemic agents in use at the present time have serious side effects of epilation, skin rashes and granulocytopenia. They must be used with caution and close supervision of the patient.

G. Estrogens:
Estrogens have been shown to inhibit experimental atherogenesis and in some cases to reduce the size of the lesions already present. However, improvement of symptoms in ischemic heart disease has not been demonstrated and feminizing side effects are undesirable.

H. Anticoagulants:
Anticoagulants are probably only of value when attacks of angina increase in severity and frequency. Anticoagulation of the patient while in hospital may help to avert infarction of the myocardium during prolonged attacks of angina.

I. Surgery:
Various surgical measures have been advocated during recent years. These include attempts at interruption of afferent pain fibers, i.e., stellate and upper dorsal ganglionectomy or section of the upper four dorsal spinal nerve roots. Other surgical measures are aimed at increasing the collateral blood supply to the heart and include internal mammary artery implantation, coronary endarterectomy, cardio-omentalpexy, coronary sinus ligation or the introduction of irritating substances into the pericardial sac. These procedures all carry a high mortality rate and uncertain results. It is ironic that in many cases simple incision of the chest wall will often decrease the severity and frequency of anginal attacks. It is difficult to assess the surgical results and none of the procedures has been widely adopted.

SUMMARY
The treatment of angina pectoris depends on reassurance, explanation, sedation and the treatment of secondary causes, such as anemia, obesity and hyperthyroidism. Nitroglycerine remains the main therapeutic agent for the specific treatment of angina pectoris.

DIAGNOSTIC THORACOTOMY AND CARDIOTOMY IN SURGERY OF MITRAL STENOSIS

Notwithstanding the development of diagnostic apparatus and the achievements of diagnosis, in a number of cases neither the clinical picture nor data of laboratory investigation enable a precise diagnosis of cardiac failure. In such cases, the authors recommend diagnostic thoracotomy and diagnostic cardiotomy with investigation of cardiac cavities. Diagnostic thoracotomy and cardiotomy may be the final diagnostic measures in the differentiation of mitral stenosis and insufficiency, where clinically one could not exclude mitral stenosis.

Upon suspicion of simultaneous presence of mitral and tricuspid stenosis, dextrolateral thoracotomy and cardiotomy are indicated for establishing the diagnosis and elimination of defects. Upon suspicion of coexistent mitral insufficiency, one may undertake exploratory cardiotomy for establishing the degree of stenosis and its correction, thus reducing the degree of stenosis and regurgitation.