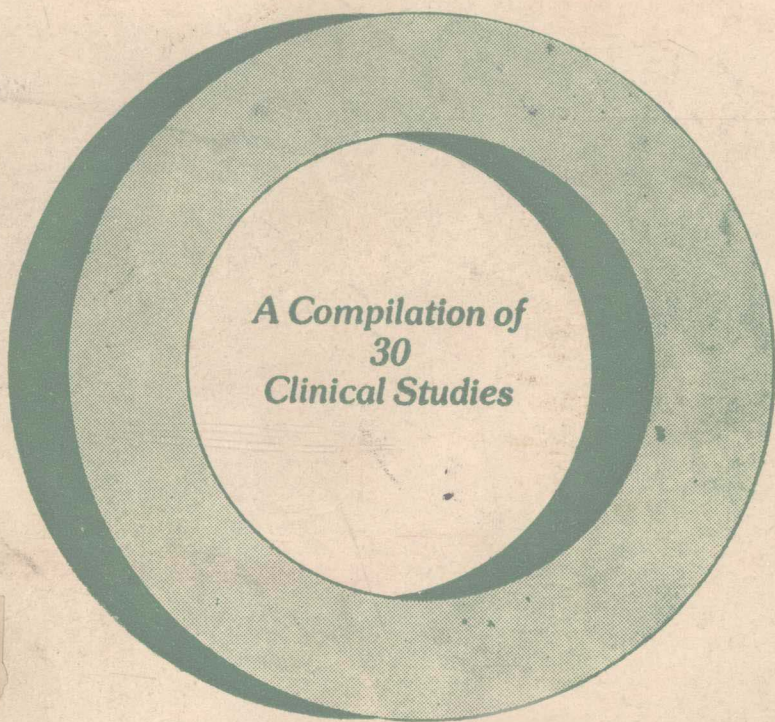


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Cardiology Case Studies

Second Edition



*A Compilation of
30
Clinical Studies*

NICHOLAS P. DePASQUALE, M.D.
MICHAEL S. BRUNO, M.D.

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A Compilation of 30 Clinical Studies

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Preface

Cardiology, perhaps more than any other medical specialty, has benefited from the remarkable technologic advances of the past quarter of a century—advances that have improved both diagnostic accuracy and quantification of cardiovascular disease. Thus, owing to echocardiography it is no longer unusual to recognize atrial myxoma during life, and radionuclide scans obviate the need for complex cineangiographic analysis to measure left ventricular ejection fraction. Nevertheless, as these case studies illustrate, the history, physical examination, and simple laboratory studies remain the most powerful diagnostic tools physicians have at their disposal—but the value of special diagnostic procedures for confirmation and quantification, particularly cardiac catheterization and coronary arteriography, has not been ignored. To do justice to advances in the field and to the relationship of the new technology to traditional modes of practice, all of the case presentations in this edition are new.

The comments at the conclusion of each case study offer a concise discussion of the pathophysiology and management of the disorder illustrated by the case. Sometimes, to broaden perspective the comments extend beyond the case material. Controversial issues have not been avoided, nor have we hesitated to include personal observations whenever we considered them appropriate.

The comments are followed by a total of 264 self-assessment questions designed to test the reader's knowledge of the case under study, but the questions are not limited to the case material. This has enabled us to explore a greater range of topics than would have otherwise been possible. Moreover, many of the answers to the questions are treated in detail to provide a maximum of information. Too often, answers to self-assessment questions are so brief that, while they test the reader's knowledge, they offer little instruction.

The bibliography has been carefully selected to provide a pathway for further exploration of knowledge gained from the case studies.

The cases presented focus attention on recent changes in the theory and practice of cardiology. Practitioners will find the cardiac disorders they are most likely to encounter—exclusive of the arrhythmias—discussed in this book. The wide range of questions should be of interest to all students of cardiovascular medicine.

We would like to express our appreciation to Dr. Viswanathan K. Tallury for his interest in this endeavor and for his generosity in furnishing some of the case material. Also we would like to thank Joan Aberle for her assistance in the preparation of the typescript.

New York, New York

Nicholas P. DePasquale

Michael S. Bruno

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To our wives,

Judith Ann and Ida Marion
whose patience and understanding made
the writing of this book possible.

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CHAPTER 1

Coronary Heart Disease

Heart disease secondary to atherosclerosis of the coronary arteries is a major cause of death and disability in the United States. The disease is the result of the complex interaction of genetic, environmental, vascular, and rheologic factors that produce both critical narrowing of the lumen of the coronary arteries and inadequate myocardial blood flow. Coronary atherosclerotic heart disease is particularly tragic, because it is the leading cause of sudden, unexpected death and it often occurs during the most productive years of a person's life. It has been estimated that nearly 1.8 million Americans below the age of 65 have definite coronary artery disease and that another 1.6 million have suspected coronary artery disease.

In spite of intensive search for the cause of coronary atherosclerosis, no unified theory has evolved. From the clinical point of view, the disease remains multifactorial. Thus, the clinician must identify each of the factors associated with increased coronary risk and then institute programs designed to eliminate or modify those risk factors. The cases presented in this chapter illustrate the association of hyperlipidemia, diabetes mellitus, cigarette smoking, excessive psychic stress, and physical inactivity with coronary atherosclerosis. Arterial hypertension—perhaps the most potent coronary risk factor—is discussed in Chapter 2 (Case 15).

While it is not known whether elimination of risk factors will bring about a reduction in the incidence of coronary heart disease, no other reasonable strategy is currently available for the prevention of coronary heart disease. Indeed, epidemiologists have such confi-

dence in the effectiveness of risk-factor modification in the prevention of coronary heart disease that they have suggested that in the near future myocardial infarction will be viewed as an epidemiologic failure.

It is encouraging that the U.S. Department of Health, Education, and Welfare's National Center for Health Statistics has found a 7% decrease in coronary heart disease mortality since 1970. Whether the decrease in mortality is attributable to preventive measures or to more effective therapy of existing heart disease is not known.

During the past 15 years changing concepts and new methods have brought interest, and in some cases lively controversy, to the subject of coronary heart disease. Some of these include the use of radioisotopes to evaluate regional myocardial perfusion and left ventricular performance, echocardiographic analysis of ventricular function, platelet aggregation in the pathogenesis of the atherosclerotic plaque, and the value of pharmacologic methods to prevent platelet aggregation, the relationship of high-density lipoprotein (HDL) cholesterol to protection in coronary heart disease, the role of triglycerides as a risk factor, and the use of certain interventions to limit infarct size.

The use of intra-aortic balloon circulatory assist in the management of cardiogenic shock has been extended, and many clinicians are applying circulatory assistance earlier and prior to the development of frank cardiogenic shock (Case 10).

Finally, the short- and long-term benefits of aortocoronary bypass surgery have been both vigorously supported and challenged.

CASE 1: Coronary Heart Disease, Healed Inferior Wall Myocardial Infarction, Hypertriglyceridemia

M.L., a 52-year-old male executive, was referred for evaluation of known coronary artery disease.

The patient was well until 11 months ago, when he experienced severe retrosternal pain associated with nausea and profuse diaphoresis following sexual intercourse. After about 20 minutes, the pain began to decrease in severity, but the diaphoresis continued until he became so alarmed that he went to the emergency room of a nearby hospital. An electrocardiogram displayed sinus bradycardia and an acute inferior wall myocardial infarction. He was given 1.0 mg atropine sulfate intravenously and was admitted to the hospital. He had no further chest pain and was discharged on the 15th day. Six weeks after discharge he returned to work. Since returning to work he has had almost daily vague epigastric and retrosternal discomfort unrelated to exertion, but sometimes related to emotional tension. He takes diazepam, 5 mg, 2 to 3 times a day. Continued anxiety concerning his cardiac status prompted him to seek further medical advice.

For about 6 months before the acute myocardial infarction he had noticed mild epigastric and retrosternal distress, but attributing it to indigestion, he did not seek medical advice. An electrocardiogram registered about 2 years ago was interpreted as normal.

There was no history of arterial hypertension, diabetes mellitus, rheumatic fever, or gout. His body weight has always been normal, but physical activity has been limited for the past 10 years. He has smoked 20 to 30 cigarettes a day for more than 30 years, but since the attack 11 months ago he has not smoked. Alcohol intake is negligible. His father is 81 years old and in excellent health, living in a rural community in Europe. His mother died at 58 years of age of cancer. He has no siblings.

Physical Examination

The patient was a well-developed man in no distress. He was 172 cm tall and weighed 68 kg. The arterial pressure was 120/80 mm Hg, radial pulse 80 beats/min and regular, respiration 18 per minute, and body temperature 37.0°C. The skin was warm and dry, and there were no xanthoma. The neck veins were not distended. The optic fundi were normal, and the thyroid gland was not enlarged. The lungs were clear to percussion and auscultation. The apical impulse was palpable just within the midclavicular line in the 5th intercostal space. The 1st heart sound in the mitral area was muffled. Both components of the 2nd heart sound were of normal intensity and varied normally with respiration at the 2nd left intercostal space. A 4th heart sound was heard at the mitral area. No murmur or friction rub was present. The liver was not enlarged, and there was no hepatojugular reflux. Peripheral pulses were normal, and there was no peripheral edema. The neurologic examination was normal.

CLINICAL DIAGNOSIS: HEALED INFERIOR WALL MYOCARDIAL INFARCTION (HISTORY)

Electrocardiogram (Fig. 1)

The electrocardiogram displayed sinus rhythm at a rate of about 75 beats/min. The PR interval was 160 msec, and the QRS duration was 80 msec. The P wave was normal. The mean axis of the QRS complex was located at about -10° in the frontal plane. Q waves were present in leads II, III, and aVF. The T waves were essentially isoelectric in leads V₅ and V₆.

INTERPRETATION: HEALED INFERIOR WALL MYOCARDIAL INFARCTION

Chest X-Ray (Fig. 2)

Examination of the chest in the PA projection showed the heart to be normal in size. Both lungs were well aerated, and there was no evidence of active pleural or parenchymal disease.

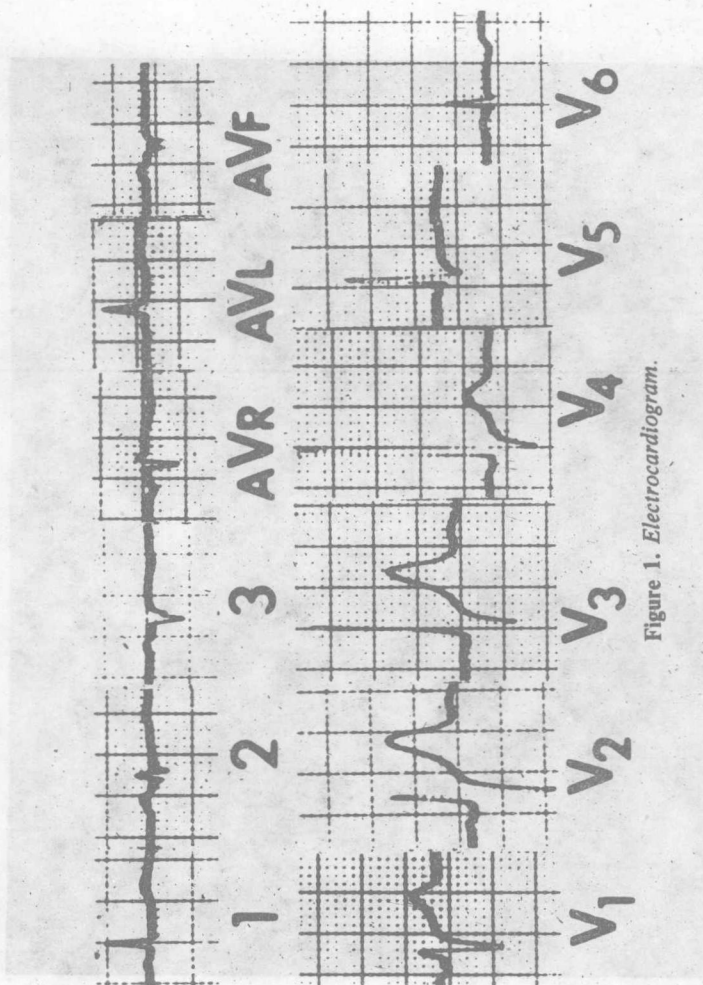


Figure 1. Electrocardiogram.



Figure 2. *X-ray film of chest, PA projection.*

Laboratory Studies

Hgb 14.3 g, Hct 44%, WBC 8.4×10^3 (normal differential count), glucose 125* mg/dl, BUN 20 mg/dl, uric acid 7.8 mg/dl, cholesterol 235 mg/dl, triglyceride 425* mg/dl, SGOT 55 mU/ml, CPK 50 U, Na 142 mEq/L, K 4.5 mEq/L, Cl 98 mEq/L. Three hour glucose tolerance: fasting 122 mg/dl, 30 min 192 mg/dl, 1 hr 177 mg/dl, 2 hr 124 mg/dl, 3 hr 72 mg/dl. High-density lipoprotein cholesterol 45 mg/dl.

Coronary Arteriography (Fig. 3)

Selective coronary arteriograms demonstrated minor irregularities in the dominant right coronary artery. There were no significant obstructive lesions in this vessel. The vessel terminated normally in a posterior descending and posterior atrioventricular groove branch. The main left coronary artery was normal. There was high-grade obstruction in the nondominant, and a somewhat small, circumflex system at the level of the obtuse marginal branch. The anterior descending branch of the left coronary artery was fully patent. There was considerable collateral circulation between the obtuse marginal branch of the circumflex artery and the left anterior descending artery and between the marginal branches of the right coronary artery and the apical region of the heart.

The left ventriculogram showed moderate hypokinesia in the inferior and posterior wall segments of the ventricle. There was no mitral regurgitation. Left ventricular pressure was 140/8 mm Hg.

Management

The large volume of the coronary collateral circulation, the absence of angina pectoris, and the limitation of significant obstructive disease to a single coronary vessel made the patient a candidate for medical rather than surgical treatment. He was placed on a program of daily bicycle exercise. In addition, he was advised to take long-

In this case and in each succeeding case the asterisk () indicates an abnormal value.

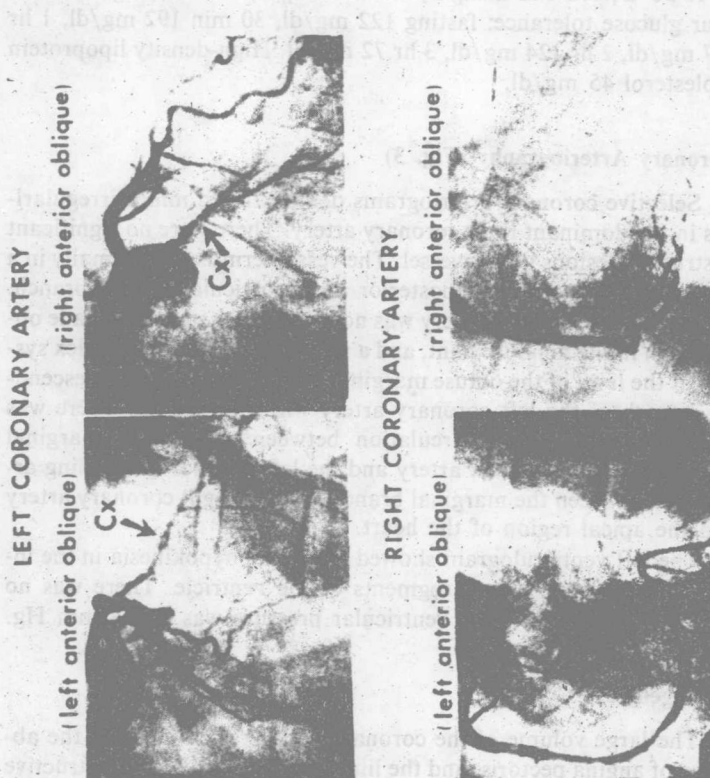


Figure 3. Coronary arteriogram: Cx, circumflex branch of left coronary artery.