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Clinical Cases in Coronary Artery Disease

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I. INTRODUCTION

Coronary artery disease (CAD) is associated with disability, death, and economic loss. A total of 6.3 million people have CAD in the United States. Patients with CAD present with various forms including chronic stable angina pectoris and acute coronary syndromes (ACS), which encompass unstable angina (UA), non–ST-elevation myocardial infarction (NSTEMI), and ST-elevation myocardial infarction (STEMI). Each type of CAD is a different stage of a single pathophysiologic process. For example, stable angina is caused by a gradual atheromatous plaque formation in the partially occluded coronary artery, which causes ischemia when myocardial oxygen demand exceeds supply. UA is caused by disrupted plaque leading to platelet aggregation and the formation of a "white" clot that is extensive enough to cause severe ischemia; this ischemia may result in infarction of myocardium seen in NSTEMI. If left untreated, NSTEMI may progress to fibrin cross-linking and "red" thrombus formation with massive myocardial damage as seen in STEMI. Using newer medications and mechanical interventions, we are now able to prevent, intervene, and even reverse this pathophysiologic process at any stage if the disease is recognized early enough.

Three case patients are provided to illustrate the 3 types of CAD (ie, stable angina pectoris, UA/NSTEMI, and STEMI) and to help reinforce the critical thinking and clinical decision-making skills needed to manage patients with this disease. Recently published guidelines will be emphasized throughout this review.

II. CASE PATIENT I PRESENTATION

Patient 1 is a 62-year-old man who presents, at his wife's request, for an evaluation of the chest discomfort that he has experienced intermittently for the past 6 months. He describes the pain as heaviness in the right side of his chest that has occurred only during activities such as walking up multiple flights of stairs, carrying heavy objects, and once when he was running to catch a bus. He did not think much of this discomfort initially because the pain would stop within minutes after resting. He also believes he experiences a similar sensation when he lies supine after large dinners.

The patient denies any dyspnea, palpitations, or lightheadedness with these episodes. His medical history is remarkable only for what he states was borderline hypertension found 20 years ago, an appendectomy 15 years ago, and obesity. He states that he drinks 1 to 2 beers per week and has smoked 1 pack of cigarettes per day for the past 40 years. His family history is remarkable for his father dying from his first myocardial infarction (MI) at age 65 years, and his only brother having a coronary artery bypass graft (CABG) at age 60 years.

The patient's vital signs include pulse rate of 80 bpm and blood pressure of 160/90 mm Hg. He appears to be an obese man in no acute distress. He has no jugular venous distention (JVD) or bruits. His cardiopulmonary examination demonstrates normal lung function, a regular heart rate and rhythm, no murmurs, positive S_4, no S_3, no rub, and a normal point of maximal impulse (PMI). The rest of his physical examination is unremarkable.

- **After obtaining a complete history and physical examination, what is the next step in evaluating patient 1?**
  - A) Radionuclide stress imaging
  - B) Coronary angiography
  - C) Formulate the probability estimate of CAD
  - D) Exercise electrocardiography (ECG)

DISCUSSION

The correct answer is C, formulate the probability estimate of CAD. Patient 1 represents a typical patient with chest pain. The initial evaluation and probability estimate are used to select the proper diagnostic test, if any, to perform and are used to interpret the test result. For example, the post-test probability of significant CAD differs very little from the pretest probability if stress testing is performed on patients who have either a low- or high-pretest probability of CAD as compared to the patients with an intermediate-pretest probability of CAD. Therefore, assessing the risk of CAD is necessary before ordering tests.