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The *Hospital Physician Critical Care Medicine Board Review Manual* is a study guide for fellows and practicing physicians preparing for board examinations in critical care medicine. Each quarterly manual reviews a topic essential to the current practice of critical care medicine.

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Unstable Angina and Non-ST-Segment Elevation Myocardial Infarction

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Table of Contents

Introduction	2
Case Presentation	2
Evaluation of Patients Presenting with UA/NSTEMI	3
Medical Treatment of UA/NSTEMI	6
Treatment Strategies	8
Conclusion	10
References	10

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Unstable Angina and Non–ST-Segment Elevation Myocardial Infarction

Andres Mesa, MD, FACC, Armando Tellez, MD, and Agustin Cruz, MD

INTRODUCTION

Unstable angina (UA) and non–ST-segment elevation myocardial infarction (NSTEMI) are common heterogeneous disorders that involve widely different risks but have similar clinical presentations. UA and NSTEMI differ primarily in whether the ischemia is severe enough to cause sufficient myocardial damage or distal microembolization of platelet aggregates and components of the disrupted plaque to release detectable levels of a marker of myocardial injury. Both conditions are components of the acute coronary syndrome (ACS) (Figure 1). Patients who present with an ACS have a high risk of myocardial infarction (MI) and death. The last few years have seen several advances in the evaluation and management of patients with UA or NSTEMI, including medical therapies and interventional procedures. Today, selection of noninvasive or invasive evaluation and optimal management can be tailored for each patient to achieve the best results.¹

EPIDEMIOLOGY

In the United States, UA/NSTEMI is an important reason for emergency department (ED) visits, accounting for approximately 5.3 million such visits per year. It accounts for more than 1 million hospital admissions annually in the United States and about 2.5 million admissions worldwide. More than half of the patients admitted to the hospital for UA/NSTEMI are older than 65 years, and almost half of them are women.² A significant percentage of patients with an acute MI develop UA in the early postinfarction period. In recent years, the number of hospital admissions for patients with UA/NSTEMI has been increasing, while the number of patients with an ST-segment elevation MI has been decreasing.¹

PATHOPHYSIOLOGY

Myocardial ischemia occurs when the blood supply is insufficient to meet the demands of the myocardium. This deficiency results in chest pain and/or dyspnea. An ACS is initiated by an atherosclerotic plaque rupture

or erosion that leads to intracoronary thrombus formation and platelet activation. The plaque invades the coronary lumen. If the plaque causes luminal narrowing of more than 70%, blood flow is reduced and the myocardial oxygen supply does not meet demand.³ The most common cause of UA/NSTEMI is nonocclusive stenosis caused by a nonocclusive thrombus. (Microembolization of platelet aggregates and components of the disrupted plaque are believed to be responsible for the release of myocardial markers in many of these patients.) Other important causes include dynamic obstruction (eg, focal spasm), mechanical obstruction, inflammation (ie, infection), and secondary causes of UA (eg, anemia, hypoxemia, hypotension, tachycardia, fever, thyrotoxicosis).⁴

CASE PRESENTATION

INITIAL PRESENTATION

A 47-year-old woman arrives in the ED with severe retrosternal chest pain radiating to the left shoulder. She has a history of hypertension, hypercholesterolemia, and cigarette smoking, but has no familial cardiac risk factors. She has had substernal chest pain during moderate exertion for the past 2 weeks. Tonight, she awoke in the middle of the night with severe chest pain that radiated to her left shoulder and was associated with diaphoresis and lightheadedness. Her known medications include amlodipine (5 mg daily), aspirin (325 mg daily), and simvastatin (20 mg daily). Upon arrival in the ED, she is given 1 nitroglycerin spray, aspirin (325 mg), morphine (4 mg intravenously), heparin (5000 U intravenously), and oxygen (2 L/min via nasal cannula); her symptoms quickly resolve.

PHYSICAL EXAMINATION

Physical examination reveals an obese, postmenopausal woman in no acute distress. She is afebrile and has a blood pressure of 150/90 mm Hg in both arms, a heart rate of 90 bpm, and respiratory rate of 18 breaths/