Myocardial Viability: A Clinical and Scientific Treatise

The aim of this book is to bridge the gap between basic cellular physiology and clinical decision-making as it relates to myocardial viability. This is an important objective, because it frequently seems that the basic and clinical sciences are 2 completely separate worlds. Unquestionably, the book provides an excellent foundation for the realization of its goal. The editor has very skillfully organized the contributions of 27 experts in various fields of cardiology into a logical and comprehensive overview of the field of myocardial viability. Additionally, the book is enjoyable to read, which indicates the contributors expended a considerable amount of effort, were dedicated, and had respect for the reader. All of the chapters are interesting and present information that stimulates associations and/or new ideas.

The first section is an introduction that provides a brief, overall perspective of myocardial viability, which, although not an easy task, is done with purpose and grace. The discussion of the potential benefits of revascularization independent of improvement in function is excellent.

The second section of the book examines basic concepts and mechanisms of stunning, hibernation, and ischemic preconditioning. Chapter 2 includes an overview of the metabolic features of each condition that emphasizes the search for commonalities and includes an interesting discussion on “programmed cell survival,” which parallels that of programmed cell death. Considering the arguably questionable clinical importance of apoptosis (ie, the fact that the vast majority of cells exposed to a similar ischemic event do not become apoptotic and only a small percentage do) suggests the importance of understanding the reason why apoptosis does not occur in the surviving cells. Chapter 4 provides an excellent, comprehensive, well-organized, and current review of preconditioning.

The third section of the book details fundamental cellular physiology and vascular biology as it pertains to myocardial viability. Chapter 6, “Essential Fuels for the Heart,” presents a complex subject with simple, well-explained examples leading to current ideas. Chapter 8, which discusses cellular electrophysiology and intercellular communication, is technical and detailed, but it has excellent figures and covers some topics (eg, ryanodine receptors, intercellular channel activity, and neural analogs) extremely effectively.

For someone with a background in the basic sciences, the last 2 sections of the book are particularly valuable with regard to helping bridge the gap to clinical practice.

The fourth section, “Advances in Functional Imaging,” reviews new clinical methods for the measurement of ventricular function, contractile reserve, features of viable and nonviable myocardium, and the impact of the timing of reperfusion on myocardial salvage. Chapters 10 and 11 compliment each other splendidly. Chapter 10 covers the strengths, applications, and limitations of various echocardiographic approaches for the assessment of myocardial viability. It provides a good discussion of various test results and clinical outcomes, with numerous current references. Chapter 11 covers the morphological and echocardiographic features of viable and nonviable myocardium, with excellent descriptions and associations between clinical test results and basic science theories. Chapter 12 gives an excellent historical review and description of the findings of numerous thrombolytic studies and an assessment of the clinical utility of percutaneous transluminal coronary angioplasty.

The final section, “Perfusion, Metabolism, and Cell Membrane Integrity,” reviews the clinical application of single photon emission computed tomography, positron emission tomography, and magnetic resonance imaging technologies to assess myocardial viability and recovery of function after revascularization. Chapter 13 effectively presents the fundamentals of tracer kinetics and its technical limitations using simple models. Chapters 14 and 15 provide a historical background on the physiology of uptake and redistribution and discuss the clinical applications for thallium 201-scintigraphy and various technetium-99m-labeled tracers, respectively. Both chapters are comprehensive and present excellent descriptions, figures, and recent references. Chapter 16 provides a detailed review of the use of various types of labeled fatty acids to assess different aspects of myocardial fatty acid metabolism. Chapters 17 and 18 review the use of positron emission tomography and nuclear magnetic resonance, respectively, to assess the severity of coronary artery disease and myocardial viability. Chapter 17 is well-organized and interesting, and it has good figures and an excellent discussion and references.

The editor and all the contributors should feel very proud of this publication. It is a current and valuable resource for anyone interested in myocardial viability and coronary artery disease, regardless of background or position. My criticisms are few and primarily influenced by personal bias, eg, I prefer to approach the investigation of stunning or many cardiac states from the perspective of these states being the appropriate response in a jungle environment, not an injury or disease. The importance of any endeavor that maintains contact between basic science and clinical cardiology cannot be overemphasized, because each can clearly benefit from the experience and developments of the other to focus and further advance our understanding of cardiac physiology and the maintenance of health in association with myocardial ischemia.

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