Pathophysiology, Evaluation and Management of Valvular Heart Diseases

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Introduction

Diseased heart valves are a growing public health concern. As death due to coronary artery disease and to non-cardiac causes has been shifted to increasingly older age groups or partially eliminated, valvular diseases have been recognized as common and progressive concomitants of aging. This is particularly true in the USA, Canada and Western Europe, where the prevalence of acquired rheumatic valvular diseases in the first three decades of life has diminished markedly compared with 50 or more years ago. However, the increasing prevalence of valvular diseases also is apparent in other parts of the world, where rheumatic fever remains a very important problem. In addition, modern diagnostic modalities and epidemiological research have led to increasing recognition of the impact of hereditary metabolic predispositions, nonfatal coronary/ischemic events and progression of congenital lesions that are clinically inapparent at birth on the total burden of valvular diseases in the aging population. The result is a growing expenditure of healthcare resources for managing clinical sequelae of dysfunctional heart valves. Consequently, recurring examination is appropriate to define current knowledge of valvular disease pathophysiology, epidemiology, natural history and management strategies. This volume represents one such examination.

More than 25 years ago, at separate institutions, we began research in valvular diseases in conjunction with management of patients with these disorders. Over the course of more than a quarter century of our own experience and that of colleagues throughout the world, it has become increasingly clear that the pathophysiology of valvular diseases varies widely with the affected valve, the specific hemodynamic characteristics of the lesion and the nature of any
associated cardiovascular pathology and that, consequently, each major valve
disease category requires individualized attention both from researchers and
from clinicians. At Weill Medical College of Cornell University, our joint
efforts in exploring concepts and evaluating patients with heart valve diseases
ultimately led to the creation of The Howard Gilman Institute for Valvular Heart
Diseases. The Institute has allowed us to focus intensively on the pathophysiol-
ogy and management of valvular diseases in an environment characterized by
progressively increasing prevalence and complexity of these diseases. The con-
ference entitled, ‘Valves in the Heart of the Big Apple: Evaluation and
Management of Valvular Heart Diseases’, organized by the Institute and jointly
sponsored by The Weill Medical College of Cornell University and The New
York Cardiological Society of the American College of Cardiology, New York
State Chapter, represents one manifestation of that focus. This publication is
drawn from the presentations of several faculty members who participated in the
first convocation of that conference, on May 10–12, 2001. The articles were pre-
pared and updated after the conference to provide succinct statements of impor-
tant contemporary concepts and concerns. In addition to relating current
thinking about appropriate timing of surgery for patients with various valve
lesions (always a moving target as evaluation strategies become more precise and
therapies become more effective and safe), sections of this volume discuss spe-
cific technical issues regarding evolving surgical approaches and selected
pathophysiological considerations at the systemic, whole organ, cellular and
molecular levels. The latter two areas increasingly are appropriate and timely
foci of investigation as the cardiology/cardiac surgery community works toward
meaningful enhancement of prognostic strategies and development of novel
pharmacotherapy, and even molecular therapy, to beneficially alter the most
fundamental pathophysiology of these diseases before, during and after surgery.

We would like to thank the faculty members that produced the articles for
this volume and to acknowledge that each of them was importantly involved, by
virtue of his or her own research, in creating the new knowledge about which each
has written. In addition, we would like to thank The Howard Gilman Foundation,
which supports much of the research at our Institute and which enabled organi-
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We believe this volume represents a useful adjunct for clinician and researcher. We hope readers will agree.

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