A.B. Lumsden, M.D.

M.G. Davies, M.D., Ph.D., M.B.A.

AORTIC DISEASE – THE EVOLVING THERAPEUTIC CHALLENGE

Alan B. Lumsden, M.D.; Mark G. Davies, M.D., Ph.D., M.B.A.

Methodist DeBakey Heart & Vascular Center, The Methodist Hospital, Houston, Texas

Aortic disease remains a significant problem in the population, and there is a concerted effort to identify, define, image, and treat these conditions to ultimately improve outcomes. The rapid development of diagnostic modalities, operative strategies, and endovascular techniques within the realm of aortic disease has transformed the field and broadened the spectrum of patients that can be treated with minimally invasive techniques. There is now a better understanding of the biology of both aortic aneurysms and aortic dissections. Detecting the right set of biomarkers to predict future aortic problems still remains an issue. Several basic science findings are being translated into potential therapeutic agents that may allow early non-surgical treatment of aortic disease. Screening by ultrasound for aortic disease is now available for high-risk patients and, if appropriately applied, may save lives. Coupled with these advances in biology and health policy has been a diffusion of technology into the community, which has resulted in an associated decrease in mortality and morbidity related to aortic interventions. Hybrid procedures, branched and fenestrated endografts, and percutaneous aortic valves have emerged as potent and viable alternatives to traditional surgeries. These new techniques have been made possible through significant advances in biomaterials and bioengineering research and their commercial application by the device industry in concert with academic medical centers and regulatory agencies. Imaging of the aorta is also transforming our understanding of the pathobiology of aortic disease, resulting in a more precise stratification. Better imaging has facilitated better preoperative case planning that allows for the placement of new and more complex devices in more difficult anatomy.

As pioneers in the treatment of aortic aneurysms, The Methodist DeBakey Heart & Vascular Center (MDHVC) developed the Acute Aortic Treatment Center (AATC) to rapidly triage and treat acute aortic disease. Since its inception in 2008, the Center has significantly improved outcomes in this family of diseases. Building on this innovation and strength, MDHVC is also launching the Aortic Center to provide a comprehensive panel of services for the patient with aortic disease. This new center will include preventative screening of abdominal aortic aneurysm (AAA), comprehensive medical management of small aneurysms, non-invasive and advanced imaging of the aorta, and defined therapeutic interventions. Linked to the development of the Aortic Center, Methodist is spearheading a regional quality outcomes registry (Southern Vascular Outcomes Network, or SOVONET) to derive outcomes data for open and endovascular interventions in the south-central United States.

In concert with these advances in technology and imaging, simulation and image manipulation with case rehearsal has allowed physicians to plan, practice, and perfect cases prior to operating on the patient. Open and endovascular simulators are now becoming part of the training paradigm for fellows and residents, and the fidelity of these devices is improving daily. Since practicing physicians can also benefit from these developments, the MDHVC has developed the DeBakey Institute for Cardiovascular Education and Training (DICET) in collaboration with the Methodist Institute for Technology, Innovation and Education (MITIE), creating a national cardiovascular training center to educate, retool, and enhance the skills of practicing physicians and augment current training paradigms for residents, fellows, and auxiliary staff.

This issue of the *Methodist DeBakey Cardiovascular Journal* highlights the progress made in endovascular repair and dissection, grafting, imaging, and hybrid techniques and illustrates the current understanding and capabilities available to diagnose and treat the spectrum of aortic diseases.

DAVIES LENDS EXPERTISE TO THIS ISSUE OF THE *METHODIST DeBAKEY CARDIOVASCULAR JOURNAL*

The editors of the *Methodist DeBakey Cardiovascular Journal* wish to thank Mark G. Davies, M.D., Ph.D., M.B.A., for serving as guest editor of this issue on aortic aneurysm repair. Dr. Davies is a professor of surgery at Weill Cornell Medical College, vice chairman for finance and administration in the Department of Cardiovascular Surgery at The Methodist Hospital, a senior member of The Methodist Hospital Research Institute, and director of research and education for the Methodist DeBakey Heart & Vascular Center. Dr. Davies serves as the founding program director for both the Vascular Surgery Fellowship and the Integrated Vascular Surgery Residency at Methodist and leads the Vascular Biology and Therapeutics and CV Clinical Innovation and Outcomes programs at The Methodist Hospital Research Institute. After receiving his medical training and Ph.D. in vascular biology from Trinity College Medical School in Dublin, Ireland, Dr. Davies completed general surgery residencies at the Royal College of Surgeons in Dublin and at Duke University, followed by a vascular surgery residency at the University of Washington in Seattle. Prior to joining the Methodist faculty in 2008, he held assistant and associate professorships in vascular surgery at the University of Rochester in Rochester, New York, where he also completed his M.B.A. Dr. Davies publishes extensively and continues to receive funding from the National Institutes of Health to support both his clinical and basic science research efforts.