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EDITORIAL FOCUS

A step toward clinically applicable noninvasive coronary wave intensity analysis
J. J. Smolich and J. P. Mynard

CALL FOR PAPERS
Cardiac Regeneration and Repair: Mechanisms and Therapy

The role of microRNAs in cardiac development and regenerative capacity (Review)
M. G. Katz, A. S. Fargnoli, A. P. Kendle, R. J. Hajjar, and C. R. Bridges

CALL FOR PAPERS
Mechanisms of Diastolic Dysfunction in Cardiovascular Disease

Left atrial aging: a cardiac magnetic resonance feature-tracking study

Knowledge of the complex age-related changes in left atrial function made possible on routine cine magnetic resonance imaging using a new feature-tracking methods is a necessary prerequisite to characterize physiological age-related left atrial changes.

CALL FOR PAPERS
Small Vessels—Big Problems: Novel Insights into Microvascular Mechanisms of Diseases

Impaired microcirculatory perfusion in a rat model of cardiopulmonary bypass: the role of hemodilution

The current study shows that impaired microcirculatory disturbances during cardiopulmonary bypass can only partially be explained by hemodilution. Endothelial and inflammatory activation are likely important contributors to microvascular perfusion deterioration. We further show that impairment of microvascular perfusion during cardiopulmonary bypass is associated with increased markers for renal injury.

(Continued)
Endothelial fibroblast growth factor receptor signaling is required for vascular remodeling following cardiac ischemia-reperfusion injury


This study is the first to demonstrate the essential role for fibroblast growth factor receptors 1 and 2 in endothelial cells for vascular remodeling after cardiac ischemia-reperfusion injury in vivo. Impaired vascular remodeling in mice deficient of endothelial fibroblast growth factor receptors resulted in persistent tissue hypoxia, increased postischemic cardiac dysfunction, and increased infarct size.

MUSCLE MECHANICS AND VENTRICULAR FUNCTION

Dissecting the role of the myofilament in diaphragm dysfunction during the development of heart failure in mice

T. E. Gillis, J. M. Klaiman, A. Foster, M. J. Platt, J. S. Huber, M. Y. Corso, and J. A. Simpson

Diaphragmatic myofilament function becomes increasingly impaired during the development of early heart failure, caused by transverse aortic constriction, and these changes occur in parallel with a decrease in the phosphorylation of key regulatory proteins. This loss of myofilament function and alterations to the contractile proteins precede impairment of the intact diaphragm.

Physiological and pathological left ventricular hypertrophy of comparable degree is associated with characteristic differences of in vivo hemodynamics


We provided the first detailed in vivo hemodynamic comparison of physiological and compensated pathological hypertrophy of similar degree in relevant rodent models using left ventricular pressure-volume analysis. Characteristic differences were detected in energy-dependent early diastolic function and mechanoenergetics, which could be explained by alterations in mitochondrial regulation.

Postnatal neonatal myocardial adaptation is associated with loss of tolerance to tachycardia: a simultaneous invasive and noninvasive assessment


The neonatal left ventricles showed better tolerance to chronotropic stress compared with that of the young infant. This was associated with at least similar diastolic reserve as found in young infants, an enhanced systolic reserve, and a unique neonatal left ventricular twist mechanics during tachycardia.
Increased postflight carotid artery stiffness and inflight insulin resistance resulting from 6-mo spaceflight in male and female astronauts


Male and female astronauts return from 6-mo spaceflight with an increase in carotid artery stiffness similar to more than 10–20 years of normal aging. They also show signs of developing insulin resistance during spaceflight. Between-sex differences were observed for several key markers that reflect vascular health.

Morphometric and hemodynamic analysis of atherosclerotic progression in human carotid artery bifurcations


Two angles are introduced to determine the stenosis in the proximal regions of the internal carotid artery (ICA). Analysis shows that the entire proximal parts of ICA (including both sinus and carina regions) were sites of plaque vulnerability. This study enhances the understanding of the pathophysiology of carotid artery disease.

RAPID REPORT

Endothelial dysfunction following prolonged sitting is mediated by a reduction in shear stress


Data from the present study reveal that preventing the reduction of shear stress during prolonged sitting with local heating abolishes the impairment in popliteal artery endothelial function. Therefore, this study provides evidence that a reduction in shear stress mediates sitting-induced leg endothelial dysfunction.