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INSIDE THIS ISSUE

MINI-FOCUS ISSUE: MECHANICAL CIRCULATORY SUPPORT: OPPORTUNITIES AND CHALLENGES

Identification and Management of Pump Thrombus in the HeartWare

Left Ventricular Assist Device System: A Novel Approach Using Log File Analysis

Ulrich P. Jorde, Keith D. Aaronson, Samer S. Najjar, Francis D. Pagani, Christopher Hayward, Daniel Zimpfer, Thomas Schlöglhofer, Duc T. Pham, Daniel J. Goldstein, Katrin Leadley, Ming-Jay Chow, Michael C. Brown, Nir Uriel

849

This study characterized patterns in the HeartWare (HeartWare Inc., Framingham, Massachusetts) ventricular assist device (HVAD) log files associated with thrombus formation and successful medical treatment. The authors found 81.3% of tPA treatments were successful when the log files displayed a low rate of power increase and absolute power. The increase in pump power consumption (130.9% vs. 196.1%) as well as the rate of increase in power (0.61 vs. 2.87) were significantly smaller for successful versus unsuccessful medical therapy. The log file parameters may allow for diagnosis of suspected device thrombosis, identification of patients suited for thrombolysis, and could substantially alter the approach to HVAD pump thrombus management.

■ EDITORIAL COMMENT

HeartWare Left Ventricular Assist Device Pump Thrombosis: A Shift Away From Ramp

J. Eduardo Rame, Edo Y. Birati

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Inhibition of ADAMTS-13 by Doxycycline Reduces von Willebrand Factor Degradation During Supraphysiological Shear Stress: Therapeutic Implications for Left Ventricular Assist Device-Associated Bleeding CME

Carlo R. Bartoli, Joeeun Kang, David J. Restle, David M. Zhang, Cameron Shabahang, Michael A. Acker, Pavan Atluri

860

Non-surgical bleeding is the most frequent complication of left ventricular assist device (LVAD) support. Supraphysiological shear stress from the LVAD accelerates von Willebrand factor (vWF) degradation by a disintegrin and metalloproteinase with a thrombospondin type 1 motif, member 13 (ADAMTS-13) (the vWF protease), which causes an acquired vWF deficiency and bleeding. With human blood, the authors tested the hypothesis that inhibition of ADAMTS-13 reduces vWF metabolism. Doxycycline, a known inhibitor of ADAMTS-13, significantly decreased ADAMTS-13 activity and protected vWF from degradation during LVAD-like shear stress. These results suggest that ADAMTS-13 is a clinical target to reduce pathological vWF degradation during LVAD support.

■ EDITORIAL COMMENT

New Treatments for Left Ventricular Assist Device-Associated Bleeding?

Martin Strueber

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Mechanical Pre-Conditioning With Acute Circulatory Support Before Reperfusion Limits Infarct Size in Acute Myocardial Infarction

873

Navin K. Kapur, Xiaoying Qiao, Vikram Paruchuri, Kevin J. Morine, Wajih Syed, Sam Dow, Nimish Shah, Natesa Pandian, Richard H. Karas

This study hypothesized that reducing left ventricular work with an axial flow catheter while delaying coronary reperfusion activates a myocardial protection program. The left anterior descending artery (LAD) was occluded for 90 min in 50-kg male swine ($n = 5/\text{group}$). In the reperfusion group, the LAD was reperfused for 120 min. In the unloading group, an axial flow pump was activated and the LAD occluded for an additional 60 min, followed by reperfusion. Compared with reperfusion alone, mechanically conditioning the myocardium with an axial flow catheter before reperfusion reduces wall stress, up-regulates stromal cell-derived factor-1 α /CXCR4 expression, increases cardioprotective signaling, reduces apoptosis, and limits myocardial damage.

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■ EDITORIAL COMMENT

Limiting Infarct Size in ST-Segment Myocardial Infarction: The Holy Grail of Reperfusion Therapy

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Eric R. Bates

CLINICAL RESEARCH

Prognostic Value of Estimated Plasma Volume in Heart Failure

886

Kévin Duarte, Jean-Marie Monnez, Eliane Albuisson, Bertram Pitt, Faiez Zannad, Patrick Rossignol

In heart failure complicating myocardial infarction, congestion assessed by the Strauss formula and an instantaneous derived measurement of plasma volume provided prediction of early cardiovascular events beyond routine clinical assessment. Trials assessing congestion management guided by this simple tool to monitor plasma volume are warranted.

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■ EDITORIAL COMMENT

Tackling Early Heart Failure Deaths and Readmissions by Estimating Congestion

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Adriaan A. Voors, Jozine M. ter Maaten

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