Development and Validation of a Novel Scoring System for Predicting Technical Success of Chronic Total Occlusion Percutaneous Coronary Interventions: The PROGRESS CTO (Prospective Global Registry for the Study of Chronic Total Occlusion Intervention) Score


The authors developed a novel score for predicting technical success of chronic total occlusion (CTO) percutaneous coronary intervention (PCI), using clinical and angiographic parameters from 781 CTO PCIs included in PROGRESS CTO (Prospective Global Registry for the Study of Chronic Total Occlusion Intervention). Factors associated with technical success included proximal cap ambiguity, moderate/severe tortuosity, circumflex artery CTO, and absence of “interventional” collaterals. The resulting score demonstrated good calibration and discriminatory capacity and performed similar to the J-CTO (Multicenter Chronic Total Occlusion Registry in Japan) score in predicting technical success (receiver operator characteristic = area 0.720 vs. 0.746, area under curve difference = 0.026, 95% confidence interval = −0.093 to 0.144).

Progress in Predicting Chronic Total Occlusion Recanalization

Wissam Jaber, Habib Samady

Scaffold Thrombosis After Percutaneous Coronary Intervention With ABSORB Biodegradable Vascular Scaffold: A Systematic Review and Meta-Analysis

Michael J. Lipinski, Ricardo O. Escarcega, Nevin C. Baker, Hadiya A. Benn, Michael A. Gaglia, Jr., Rebecca Torguson, Ron Waksman

The authors performed a systematic review and meta-analysis to assess outcomes after implantation of the ABSORB biodegradable vascular scaffold (BVS) and compared with drug-eluting stent placement. Of 25 studies with 8,351 patients undergoing BVS implantation, cardiovascular death occurred in 0.6%, myocardial infarction in 2.1%, target lesion revascularization in 2.0%, and definite/probable scaffold thrombosis in 1.2% of patients over 6.4 ± 5.1 months of follow-up. Meta-analysis demonstrated that patients who received a BVS were at a 2-fold higher risk of myocardial infarction (p = 0.002) and definite/probable scaffold thrombosis (p = 0.03) compared with patients who received drug-eluting stents. Further studies are needed to assess whether a BVS increases the risk of scaffold thrombosis.
The prevalence and effect of chronic kidney disease (CKD) in women undergoing percutaneous coronary intervention (PCI) with drug-eluting stents (DES) is unclear. The authors pooled patient-level data (n = 10,449) from 26 randomized controlled trials evaluating safety and efficacy of DES. A significant stepwise gradient in major adverse cardiovascular event (MACE) rates was observed with worsening renal function (26.6% for creatinine clearance [CrCl] < 45 ml/min vs. 15.8% for CrCl 45 to 59 ml/min vs. 12.9% for CrCl ≥ 60 ml/min; p < 0.01). Following multivariable adjustment, CrCl < 45 ml/min was independently associated with a higher risk of MACE and all-cause mortality. Use of new-generation DES was associated with reduced risk of cardiac death, MI, or stent thrombosis compared with early-generations in women with CKD.

SEE ADDITIONAL CONTENT ONLINE
Polymer-Free Biolimus A9-Coated Stents in the Treatment of De Novo Coronary Lesions: 4- and 12-Month Angiographic Follow-Up and Final 5-Year Clinical Outcomes of the Prospective, Multicenter BioFreedom FIM Clinical Trial

Ricardo A. Costa, Alexandre Abizaid, Roxana Mehran, Joachim Schofer, Gerhard C. Schuler, Karl E. Hauptmann, Marco A. Magalhães, Helen Parise, Eberhard Grube, for the BioFreedom FIM Clinical Trial Investigators

The BioFreedom (BFD) drug-coated stent incorporates a low-profile, stainless-steel platform with a surface that has been modified to create a selectively microstructured abluminal surface that allows adhesion and further release of Biolimus A9 (Biosensors Europe SA, Morges, Switzerland). A total of 182 patients were randomized (1:1:1) for treatment with BFD “standard dose” or BFD “low dose” versus first-generation paclitaxel-eluting stents (PES). At 12 months, in-stent late lumen loss (primary endpoint) was 0.17 mm in BFD versus 0.35 mm in PES (p = 0.001 for noninferiority); however, BFD-LD (0.22 mm) did not reach noninferiority. At 5 years, major adverse cardiac events were similar; also, there was no definite/probable stent thrombosis reported.

SEE ADDITIONAL CONTENT ONLINE

EDITORIAL COMMENT

The Quest for the Perfect Stent for a Given Patient: Drug-Coated Stents for the Treatment of Coronary Disease

Marie-Claude Morice, Fadi J. Sawaya

Prospective Multicenter Evaluation of the Direct Flow Medical Transcatheter Aortic Valve System: 12-Month Outcomes of the Evaluation of the Direct Flow Medical Percutaneous Aortic Valve 18F System for the Treatment of Patients with Severe Aortic Stenosis (DISCOVER) Study

Thierry Lefèvre, Antonio Colombo, Didier Tchétché, Azeem Latib, Silvio Klugmann, Jean Fajadet, Federico De Marco, Francesco Maisano, Giuseppe Bruschi, Klaudija Bijukčić, Stefano Nava, Neil Weissman, Reginald Low, Martyn Thomas, Christopher Young, Simon Redwood, Michael Mullen, John Yap, Eberhard Grube, Georg Nickenig, Jan-Malte Sinning, Karl Eugen Hauptmann, Ivar Friedrich, Michael Lauterbach, Michael Schmoeckel, Charles Davidson, Joachim Schofer

The Direct Flow Medical transcatheter heart valve is a new-generation nonmetallic aortic valve with a pressurized support structure and conformable double-ring annular sealing delivered through an 18-F sheath. The device allows assessment of valve performance before permanent implantation. The 1-year outcome of this European registry of 100 consecutive patients with severe aortic stenosis contraindicated or too high risk for surgery shows 90% freedom from death and 85% freedom from death or stroke. Echocardiography demonstrated none/trace to mild aortic regurgitation in all patients and an unchanged mean aortic gradient of 12.2 ± 6.6 mm Hg and effective orifice area of 1.6 ± 0.4 cm².

SEE ADDITIONAL CONTENT ONLINE

EDITORIAL COMMENT

Next Generation Valves: What Are We Looking for?

E. Murat Tuzcu, Samir R. Kapadia
Transcatheter Versus Surgical Closure of Atrial Septal Defects in Children: A Value Comparison
Yinn Khurn Ooi, Michael Kelleman, Alexandra Ehrlich, Michelle Glanville, Arlene Porter, Dennis Kim, Brian Kogon, Matthew E. Oster

Using data from the Pediatric Hospital Information System for 2004 to 2012, the authors compared the value of transcatheter versus surgical ASD closure for children ages 1 to 17 years. There were 4,606 transcatheter procedures and 3,159 surgeries at 35 children’s hospitals. There was no mortality. Children with a surgical procedure had a longer length of stay (4.0 days vs. 1.5 days, \( p < 0.0001 \)), were more likely to have an infection (odds ratio [OR]: 3.73, \( p < 0.0001 \)) or procedural complication (OR: 6.66, \( p < 0.0001 \)). Costs for transcatheter procedure encounters were lower ($19,128 vs. $25,359, \( p < 0.0001 \)). Both procedures had excellent short-term outcomes, but transcatheter procedures had lower overall costs, providing better short-term value than surgery.

EDITORIAL COMMENT
Transcatheter Versus Surgical Closure of Atrial Septal Defects
Emile Bacha

Prevention of Contrast-Induced Nephropathy by Central Venous Pressure-Guided Fluid Administration in Chronic Kidney Disease and Congestive Heart Failure Patients
Geng Qian, Zhenhong Fu, Jun Guo, Feng Cao, Yundai Chen

Hydration before contrast administration is considered the cornerstone of contrast-induced nephropathy (CIN) prevention. The authors aimed to explore an individual hydration method for patients with congestive heart failure (CHF) and chronic kidney disease (CKD). These CHF-complicated CKD patients randomly received either central venous pressure (CVP)-guided hydration (\( n = 132 \)) or standard hydration (\( n = 132 \)). CIN occurred less frequently in CVP-guided hydration group. The incidence of acute heart failure during the perioperative period did not differ between the 2 groups. CVP-guided fluid administration can safely and effectively reduce the risk of CIN in patients with CKD and CHF.

EDITORIAL COMMENT
Improving Intravenous Fluid Therapy for Prevention of Contrast-Induced Nephropathy: How to Give More Without Causing Heart Failure
Richard Solomon
Late False Aneurysm Formation After Transfemoral Transcatheter Aortic Valve Replacement
Colin Schamroth

In-Stent Dissection Causes No Flow During Percutaneous Coronary Intervention
Fumiaki Yashima, Shinsuke Yuasa, Yuichiro Maekawa, Mai Kimura, Keitaro Akita, Ryo Yanagisawa, Makoto Tanaka, Kentaro Hayashida, Takashi Kawakami, Hideaki Kanazawa, Jun Fujita, Keiichi Fukuda

**ONLINE FEATURE** First Successful Transfemoral Implantation of an Edwards Sapien XT Valve in a Direct Flow Valve After Early Restenosis
Christian Butter, Grit Tambor, Michael Neuss, Hidehiro Kaneko, Thomas Schau, Frank Hoelschermann

**ONLINE FEATURE** Hypertrophic Obstructive Cardiomyopathy and Uncontrolled Hypertension: A Therapeutic Challenge
Abdallah El Sabbagh, Darrell B. Newman, William R. Miranda, Rick A. Nishimura

**ONLINE FEATURE** Use of Bioresorbable Vascular Scaffold in Acute Dissection: Insights From Optical Coherence Tomography
Sandeep Basavarajaiah, Toru Naganuma, Mamoon Qadir

**ONLINE FEATURE** Hemodynamic and Intravascular Ultrasound Evaluation of an Infrarenal Aortic Stenosis
Paul M. Johnson, Joseph M. Stavas, George A. Stouffer

**ONLINE FEATURE** Collapse of a Bioresorbable Novolimus-Eluting Coronary Scaffold
Daniel Braun, Moritz Baquet, Steffen Massberg, Julinda Mehilli, Jörg Hausleiter

**ONLINE FEATURE** These articles do not appear in the printed issue. They are available in the online version of this issue.
LETTERS TO THE EDITOR

Is Coronary Wedge Pressure a Technique to Identify High-Risk Patients Who May Benefit From Alternative Treatment in Acute Myocardial Infarction? Is This The Next Step?
Adrian C. Iancu, Dan Rafiroiu, Madalin Marc

Reply
Niket Patel, Adrian P. Banning, Rajesh K. Kharbanda

Personalized Antiplatelet Therapy: The Odyssey Continues
Laurent Bonello, Francoise Dignat-George, Marc Laine

Reply
Renato Valenti, David Antoniucci

Cerebral Embolization After Implantation of a Balloon-Expandable Aortic Valve Without Prior Balloon Valvuloplasty: When Is Doing Less More?
Femi Philip, Garrett B. Wong, Jeffrey A. Southard

Reply
Klaudija Bijuklic, Joachim Schofer

EDITOR'S PAGE

Risk Avoidance: For Whom?
Spencer B. King III