Late-Breaking Trials

HIGHLIGHTS FROM TUESDAY MORNING’S TRIAL PRESENTATIONS.

A UNIQUE BIOCONVERTIBLE INFERIOR VENA CAVA FILTER: 1-YEAR RESULTS FROM THE SENTRY TRIAL
Presenter: Michael D. Dake, MD

Pulmonary embolism (PE) leads to the hospitalization or death of approximately 225,000 Americans annually and is the leading cause of preventable in-hospital mortality. Used appropriately, inferior vena cava (IVC) filters save lives and reduce injury and costs related to PE. However, the use of retrievable IVC filters is controversial, as some existing technologies have a high incidence of reported complications, including device tilting, migration, embolization, fracture, or IVC perforation. This may be due to a combination of factors including device design and prolonged implant time as a consequence of a low incidence of retrieval. The US Food and Drug Administration (FDA) has published two warning letters encouraging physicians to retrieve IVC filters after the transient risk period for PE subsides, which is typically < 30 days.

The Sentry bioconvertible inferior vena cava filter (Novate) is a new generation of IVC filter designed to provide protection from PE for the period of transient risk and then bioconvert to leave an unobstructed IVC lumen. The Sentry is designed to eliminate the requirement of retrieval and to reduce IVC filter-related complications.

The safety and effectiveness of the Sentry filter were assessed in the SENTRY trial: 129 patients requiring temporary PE protection were enrolled across 23 sites. The rate of new symptomatic PE through 12 months was 0% (0/129). There were no instances of filter tilting, migration, embolization, fracture, IVC perforation through 12 months, or device-related deaths. The rate of successful Sentry bioconversion was 95.7% (110/115) at 6 months and 96.4% (106/110) at 12 months, much better than published retrieval rates. The Sentry IVC filter received FDA 510(k) clearance in February 2017 and represents an important new development in the prevention of PE.

TWO-YEAR RESULTS FROM THE IN.PACT GLOBAL STUDY
Presenter: Prof. Thomas Zeller MD

IN.PACT Global is an independently adjudicated and monitored multicenter, international, prospective, single-arm study designed to expand on clinical evidence with the In.Pact Admiral drug-coated balloon (DCB) (Medtronic) for the treatment of real-world patients with symptomatic (Rutherford 2–4) femoropopliteal disease. In total, 1,406 intention-to-treat subjects treated with the In.Pact DCB were analyzed as part of the consecutively enrolled clinical cohort. A subset of the clinical cohort, referred to as the imaging cohort, underwent duplex ultrasound imaging at 12 months and at the time of any re-intervention within 12 months to assess target lesion patency. The imaging cohort consisted of three prospectively prespecified subgroups, and data for the pure subjects in each group have been presented: de novo in-stent restenosis (n = 131), long lesion ≥ 15 cm (n = 157), and chronic total occlusion ≥ 5 cm (n = 126).

Herein, longer-term outcomes in the entire study cohort to 2 years are reported.

The mean age of subjects in the clinical cohort was 68.6 ± 10.1 years, and 67.8% were male. Based on the assessment of 1,773 target lesions, the mean lesion length was 12.1 ± 9.54 cm, including 18% in-stent restenosis, 35.5% total occlusions, and 68.7% calcified lesions. The Kaplan-Meier estimate of freedom from clinically driven target lesion revascularization (CD-TLR) within 24 months was 83.3%. Primary safety, defined as freedom from device- and procedure-related mortality through 12 months and freedom from major target limb amputation and clinically driven target vessel revascularization within 24 months, was 81.7%. The rates of major target limb amputations and thrombosis within 24 months were 0.7% and 4.5%, respectively.

To date, IN.PACT Global is the largest independently adjudicated DCB study of real-world patients with femoropopliteal artery disease. Two-year results demonstrate consistent and durable clinical performance of the In.Pact Admiral DCB and confirm the positive results observed in the IN.PACT SFA randomized trial.

PACLITAXEL-ELUTING STENT TREATMENT FOR FEMOROPOPPLITEAL ARTERY DISEASE: INSIGHTS FROM THE ZILVER PTX POSTMARKET SURVEILLANCE STUDY IN JAPAN
Presenter: Michael D. Dake, MD

 Favorable long-term outcomes of the Zilver PTX drug-eluting stent (DES) (Cook Medical) in femoropopliteal lesions have been previously demonstrated in a large randomized study and a complementary, single-arm study. Five-year follow-up is underway in Japan to further evaluate this DES in real-world patients.

The first 900 patients in Japan treated with the DES were enrolled. Clinical benefit was defined as freedom from persistent or worsening claudication, rest pain, ulcer, or tissue loss. Subgroup analyses were performed to evaluate the results with the DES in patients with chronic renal failure (CRF), no continuous patent infrapopliteal runoff vessels, and in-stent restenosis (ISR).

In this study, 905 patients with 1,080 lesions were enrolled at 95 institutions. Comorbidities included a high incidence of chronic kidney disease (44%) and critical limb ischemia (21%). Lesions were complex, with an average length of 14.6 cm, 42% total occlusions, 7% with no patent runoff vessels, and 19% ISR. Recent data through 4 years show the freedom from target lesion revascularization (TLR) rate was 78.4% and clinical benefit was 72.7% for the overall study. Subgroup analyses through 2 years show the freedom from TLR rate was similar for patients with and without CRF (81.4% vs 84.9%, P = .24) and for patients in the no-runoff group compared to the runoff group (81.3% vs 83.8%, P = .87). There was a trend toward slightly lower freedom from TLR in patients with ISR compared to patients without ISR, but this fell short of statistical significance (76.6% vs 85.3%, P = .05).

The current study continues to show positive outcomes through 4 years, providing further assurance of the long-term benefit of the Zilver PTX DES. For the challenging subgroups evaluated, results were similar and favorable through 2 years, indicating that the Zilver PTX DES may be a valid treatment option for patients with these difficult-to-treat lesions.
Late-Breaking Trials
HIGHLIGHTS FROM TUESDAY MORNING’S TRIAL PRESENTATIONS.

PRIMARY PATENCY OF A 3D HELICAL STENT: SIGNIFICANT OUTCOMES FROM THE MIMICS STUDY
Presenter: Prof. Thomas Zeller, MD

Long-term durable outcomes after femoropopliteal interventions remain an elusive goal for endovascular interventionalists and patients. Despite optimistic early data from studies of drug-coated balloons (DCBs), the reality of intervention in the complex lesions that are common in regular practice (compared to those in the initial studies) is that stenting is commonly required. The choice of stent for both provisional stenting and to complement DCB use then becomes an important issue because confounding factors of calcification, lesion length, occlusion, and diabetes are strong predictors of outcome. The BioMimics 3D helical stent (Venyang Medical, Ltd.) has a 3D helical centerline designed to impart nonplanar curvature to the vessel, promoting swirling blood flow. Swirling flow elevates wall shear on endothelial cells in the arterial wall, which has been shown to be protective against the development of neointimal hyperplasia and atherosclerosis.1,2 The BioMimics 3D vascular stent system was evaluated in the MIMICS study, which randomized 76 patients with symptomatic peripheral artery disease 2:1 to either BioMimics 3D or LifeStent (Bard Peripheral Vascular). A statistically significant difference was observed in primary patency through 24 months (P = .005). A post-hoc analysis was conducted to assess how performance of the BioMimics 3D stent was affected by these outcome confounding factors. The presence of calcification did not affect curvature of the BioMimics 3D stented segment nor the generation of swirling flow within. The analysis also confirmed that primary patency for BioMimics 3D was independent of the severity of calcium, lesion length, occlusions, or diabetes. These data support the BioMimics 3D helical stent in primary stenting of complex lesions and point to potential for complementary use with DCBs.

Further MIMICS studies are internationally underway to provide an evolving database of safety and effectiveness outcomes in more than 1,300 subjects undergoing femoropopliteal intervention. The BioMimics 3D Vascular Stent System is an Investigational Device. Limited by Federal (or United States) Law to Investigational Use.

FOUR-YEAR RESULTS OF THE IN.PACT SFA TRAIL COMPARING A DRUG-COATED BALLOON CATHETER VERSUS AN UNCOATED BALLOON CATHETER IN FEMOROPOPLITEAL LESIONS
Presenter: Peter A. Schneider, MD

IN.PACT SFA is an independently adjudicated, prospective, multicenter, randomized single-blinded trial that enrolled 331 patients with symptomatic (Rutherford 2–4) femoropopliteal lesions. Patients were randomly assigned in a 2:1 ratio to treatment with the In.Pact Admiral palmitel-coated balloon (DCB) catheter (Medtronic) (n = 220) or standard percutaneous transluminal angioplasty (PTA, n = 111). At 4 years, study assessments included major adverse events (MAEs), defined as all-cause mortality, clinically driven target vessel revascularization (CD-TVR), major target limb amputation, thrombosis at the target lesion site, and time to first clinically driven target lesion revascularization (CD-TLR). Duplex ultrasound imaging was not mandated after the 3-year visit, so patency was not evaluated at this time point.

At 4 years, the Kaplan-Meier (KM) estimate of freedom from CD-TLR was 76.8% for DCB and 70.4% for PTA (log-rank P = .0399), with time to first CD-TLR within 4 years significantly longer for the DCB group (739.2 ± 384 days vs 302.9 ± 213 days; P < .001). The MAE rate was 38% and 40.8% for DCB and PTA, respectively (P = .705). There were no device- or procedure-related deaths and no major target limb amputations in either group through 48-month follow-up. The rate of vessel thrombosis was low (DCB, 2.2% vs PTA, 4.9%; P = .290), with no new events reported between 3 and 4 years.

Four-year results of the IN.PACT SFA trial demonstrated sustained treatment effect in maintaining significantly higher freedom from CD-TLR by KM estimate in patients treated with the In.Pact Admiral DCB compared to PTA despite a late catch-up effect. Among patients requiring reintervention, the mean time to the first event was significantly longer in the DCB group. To the best of our knowledge, this is the first investigational device exemption study to report long-term outcomes with DCBs in this patient population and stresses the importance of follow-up beyond 3 years with drug-eluting technologies.

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Late-Breaking Trials

HIGHLIGHTS FROM TUESDAY AFTERNOON’S TRIAL PRESENTATIONS.

DANCE TRIAL: 2-YEAR OUTCOMES FROM THE 157-LIMB ATERECTION COHORT
Presenter: George Adams, MD

The DANCE (Dexamethasone to the Adventitia to Enhance Clinical Efficacy in Femoropopliteal Arteries) trial was designed to demonstrate safety and efficacy of adventitial dexamethasone delivery to improve durability after femoropopliteal revascularization. Proof-of-concept trials have been performed to combine drug delivery and atherectomy, but the DANCE trial’s atherectomy subgroup (n = 157) exceeds the scale of the next-largest trial of such a combination (DEFINITIVE-AR enrolled 67 limbs with directional atherectomy and drug-coated balloon).

Subjects were eligible for enrollment if they had Rutherford 2–4 peripheral artery disease and lesions in the femoral and/or popliteal arteries up to 15 cm in length. Atherectomy methods included directional, rotational, laser, and front-cutting. Stenting was allowed and did not preclude subjects from enrollment. The Buffalo micro-infusion device (Mercator MedSystems) delivery of dexamethasone sodium phosphate (3.2 mg/ml) with 20% contrast medium was performed after atherectomy and prior to any stenting. Subjects were seen at 6-, 12-, 18-, and 24-month follow-up. Primary patency was determined by lack of binary restenosis (ultrasound peak systolic velocity ratio cutoff of > 2.4) or clinically driven target lesion revascularization (CD-TLR). Per-protocol (PP) analysis excluded ≥ 35% residual stenosis at the end of the case per angiographic core laboratory, target lesions extending into the tribal arteries, and concurrent treatment with other drug-eluting products in the same limb.

DANCE enrolled 283 limbs from 262 subjects, with 157 limbs revascularized using atherectomy (ATX group) and 124 limbs receiving angioplasty. Of the 157 ATX limbs enrolled, 140 qualified for the PP analysis. The preliminary 2-year primary patency rate is 72.8% (70.3% intention-to-treat) and freedom from CD-TLR was seen in 85.2% of subjects (82.7% intention-to-treat). There was no loss of patency seen between months 24 and 25 as the analysis window was closed.

Two-year results from the DANCE trial ATX group provide the largest, long-term data set to illustrate patency rates in atherectomy subjects with adjunctive local drug therapy.

ACOART I STUDY: 24-MONTH RESULTS OF THE ACOTEC DRUG-COATED BALLOON CATHETER IN FEMOROPOPLITEAL ARTERIES
Presenter: Prof. Wei Guo, MD

The AcoArt I study aimed to evaluate the safety and efficacy of the Orchid drug-coated balloon (DCB) (Acotec Scientific) for treatment femoropopliteal arterial disease. Two hundred Chinese patients with peripheral artery disease and lesions were treated with the Orchid paclitaxel-coated balloon or a standard uncoated balloon catheter. The primary endpoint was angiographic late lumen loss (LLL) at 6 months measured by a blinded core lab. Doppler ultrasound examination and clinical endpoints were evaluated at 12 and 24 months.

The patient population was 74% male, an average of 66 years old, 31% smokers, 55% diabetic, Rutherford class 2–5, had an average lesion length of 150 mm, 25% in-stent restenosis, 55% occlusion or partial occlusion, and 20% had provisional stenting. LLL at 6 months was available for 89% and there was clinical follow-up for > 95% per group. LLL was 0.05 ± 0.73 mm (DCB) and 1.15 ± 0.89 mm (uncoated balloon, P < .001). Correspondingly, primary patency at 24 months was 64.6% versus 31.4% (P < .05) for the DCB and uncoated balloon, respectively. This demonstrates strong durability over 2 years with superior performance in primary patency for the Orchid DCB versus PTA. After 24 months, the freedom from clinically driven target lesion revascularization (CD-TLR) rate was 86.5% versus 58.6% (P < .05). There were no significant differences between groups in the rates of death and major amputation (9.4% vs 9.6%, P = .98).

AcoArt I demonstrates the safety and efficacy of the Orchid DCB in treating femoropopliteal arterial disease and sustained durability of the DCB treatment effect with no late catch-up through 2 years.

SAFETY AND Efficacy of a Novel Percutaneous Bypass Procedure for Long-segment Femoropopliteal Lesions > 25 cm: A Sub-analysis from the PQ Bypass Detour I Trial
Presenter: Sean P. Lyden, MD

Historically, physicians have treated extremely long-segment femoropopliteal lesions with bypass surgery, which has the benefit of durability; however, it is associated with an increased risk of complications, longer hospital stays, and prolonged rehabilitation. This subset analysis of the DETOUR I trial studies the safety and effectiveness of the Detour procedure (PQ Bypass), a novel percutaneous bypass procedure in the treatment of extremely long-segment (> 25 cm) femoropopliteal disease. This prospective, multicenter, nonrandomized, single-arm trial is one of the largest prospective series to evaluate the percutaneous treatment of femoropopliteal blockages with lengths of 25 cm to 45 cm (mean, 33.8 cm).

The 6-month outcomes from 50 patients demonstrated the DETOUR system’s ability to successfully treat these long blockages without significant impact on venous health and low rates of major adverse events (MAEs). There was a 2% rate of MAEs (the primary safety endpoint), which was defined as death, target vessel revascularization (TVR), or amputation at 30 days. There were no deaths or amputations and one TVR. The primary patency rate was 88.9% at 6 months with optimal device placement, and an overall primary patency rate of 76.9%. Delivery of devices and removal of the delivery system was successful in 100% of lesions. Improvement in Rutherford class of at least two grades was observed in 92% of patients; 94% of subjects improved ≥ one class over baseline at 6 months. Significant improvement was seen in ankle-brachial index (from 0.64 ± 0.17 to 0.92 ± 0.14, P < .0001) No impact was made on venous function, and there were no device-related deep vein thromboses in treated vessels.
Late-Breaking Trials

HIGHLIGHTS FROM TUESDAY AFTERNOON’S TRIAL PRESENTATIONS.

CLINICAL OUTCOMES AMONG VASCULAR PROCEDURE PATIENTS RECEIVING PERCLOSE PROGLIDE SUTURE-MEDIATED CLOSURE COMPARED TO PATIENTS RECEIVING SURGICAL CUTDOWN FOR CLOSURE OF LARGE-BORE ARTERIAL ACCESS

Presenter: Darren B. Schneider, MD

This study compared clinical outcomes and complication rates among patients undergoing closure of large-bore arterial access using the Perclose ProGlide suture-mediated closure system (Perclose) (Abbott Vascular) versus surgical cutdown (cutdown) in a real-world setting.

This retrospective study utilized the IBM Explorys research database, which contains longitudinal patient data for approximately 55 million United States patients since 2012. Patients undergoing large-bore arterial access procedures, including transcatheter aortic valve replacement, abdominal aortic aneurysm repair, thoracic aortic aneurysm repair, or balloon aortic valvuloplasty were identified. Outcomes were assessed during index admission and 30 days postprocedure.

A total of 839 Perclose and 2,569 cutdown patients met the inclusion criteria. Of these, 757 Perclose and cutdown patients were propensity matched with sex, age, index procedure, index year, prior blood transfusion, and history of peripheral vascular disease. After performing multivariate analyses to control for additional variables (anticoagulant use, atherosclerosis, cancer, chronic respiratory disease, myocardial infarction, stroke, and blood transfusion), the significantly lower complication rates for Perclose patients persisted. During the hospital admission for the procedure, Perclose patients were 80% less likely to require a blood transfusion (odds ratio, 0.20, P < .001) and 41% less likely to have an infection (odds ratio, 0.59, P < .001). In addition, mortality rate at 30 days was 70% lower among Perclose patients (odds ratio, 0.30, P < .001). The average hospital length of stay during the index procedure was significantly shorter for Perclose patients (5.1 days vs 9 days; P < .001).

The use of Perclose ProGlide suture-mediated closure system for closure of large-bore arterial access was associated with significantly lower rates of blood transfusion, infection, mortality, and shorter length of stay compared to surgical cutdown. Perclose should be considered for large-bore closure to minimize access site complications and resource use.

INTERIM 18-MONTH RESULTS OF THE AV TRIAL: A RANDOMIZED TRIAL OF DRUG-COATED BALLOONS IN HEMODIALYSIS ARTERIOVENOUS FISTULAE

Presenter: Scott Trerotola, MD

Restenosis remains a major problem in hemodialysis access interventions. Paclitaxel-coated balloons have shown promise in reducing restenosis in arterial applications and in small trials in hemodialysis access. The Lutonix AV multicenter trial explored the role of the Lutonix drug-coated balloon (DCB) (Bard Peripheral Vascular) in hemodialysis arteriovenous fistulae (AVF).

This randomized trial enrolled 285 patients with dysfunctional AVF. All patients received percutaneous transluminal angioplasty (PTA) of the lesion responsible for access dysfunction. After successful PTA, lesions were treated with either a paclitaxel-coated balloon or a control balloon of similar design to the DCB but without drug. Endpoints included 6-, 9-, 12-, 18-, and 24-month postintervention target lesion primary patency (TLPP) and safety. Kaplan-Meier analysis was used for endpoint analyses, both with and without a 30-day reporting window.

The primary safety endpoint was met and did not differ between groups (P = .002). The 6-month efficacy endpoint was not met with TLPP of 71% for DCB and 63% for control (P = .056), however, at the end of the 6-month window (210 days), TLPP was superior for DCB (64% vs 53%, P = .024). Interventions to maintain target lesion patency were fewer for DCB at 6 months (44/patient vs 64/patient; 31.3% fewer reinterventions). At interim 18 months, the survival curves remain separated with a 37% improvement in TLPP over control (P = .038). DCB-assisted PTA was superior to conventional PTA at 210 days for TLPP. The DCB benefit persists at 18 months. Both arms demonstrated equivalent safety.

Conclusions
• The use of Perclose for closure of large bore arterial access is associated with significantly lower blood transfusions, infections, mortality, and length of stay compared to cutdown
• Perclose patients 80% less likely to require a blood transfusion and 41% less likely to have an infection
• Hospital length of stay is significantly shorter for Perclose patients (5.1 days vs 9 days)
• Perclose should be considered preferable to cutdown to minimize access site complications and resource use

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