Meeting Highlights

CARDIOVASCULAR RESEARCH TECHNOLOGIES 2019

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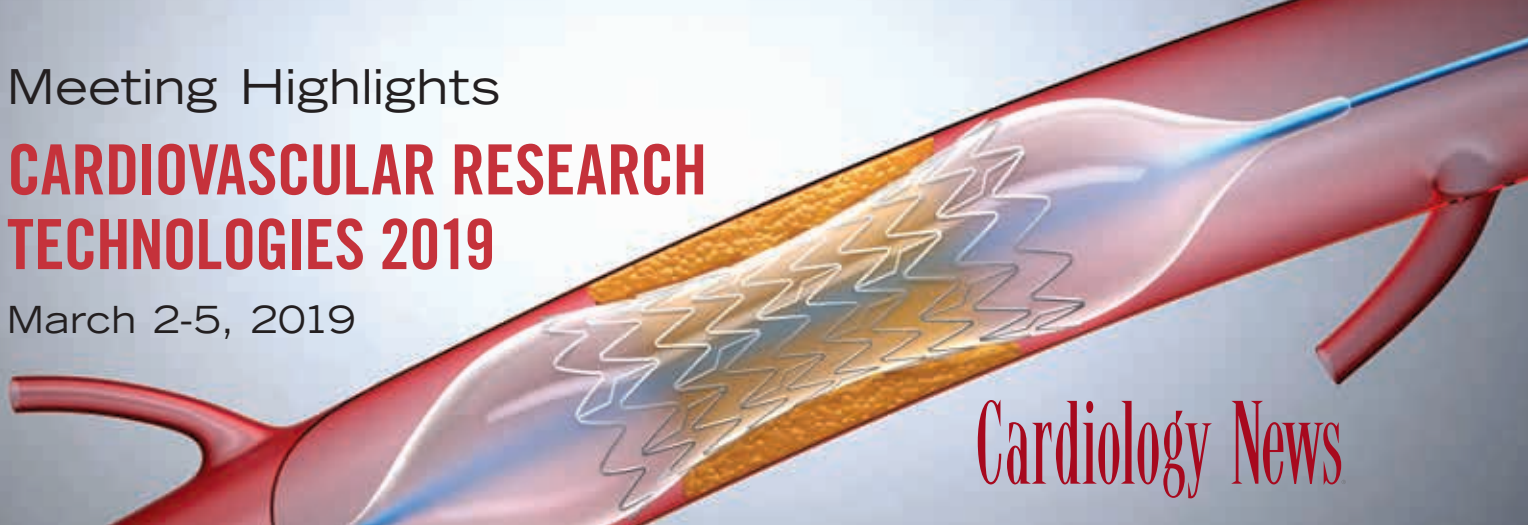

Cardiology News

Ultrathin stent loses advantage at 3 years

WASHINGTON – In the latest analysis of data from a randomized trial comparing three different thin polymer-coated drug-eluting stents, the signal at 1 year that the thinnest device might reduce the risk of target lesion revascularization has been lost at 3 years, according to an update of results from the BIO-RESORT trial presented at Cardiovascular Research Technologies 2019.

"At 3-year follow-up, all three drug-eluting stents were associated with favorable outcomes and both very-thin-strut polymer-coated devices showed safety and patency similar to the thin-strut durable polymer drug-eluting stent," reported Clemons von Birgelen, MD, PhD, professor of cardiology, University of Twente, Enschede, the Netherlands.

In order of strut thickness, the stents tested in BIO-RESORT were Orsiro (60 mcm), Synergy (74 mcm), and Resolute Integrity (90 mcm). Although the study had a noninferiority design, the potential for the biodegradable polymer coatings of the two thinner stents to provide faster healing than the durable polymer of the Resolute stent was one of the driving hypotheses of the trial (Lancet. 2016 Nov 26;388[10060]:2607-17).

Some support for this hypothesis was provided by 2-year results presented at EuroPCR 2018 last year. At that time, it was reported that the risk of target lesion revascularization between the end of year 1 and end of year 2 was significantly lower for the Orsiro stent (1.3%) than the Resolute stent (2.3%). Target lesion revascularization also was lower in the Synergy stent group (1.8%), but this rate did not differ significantly from that of the other two stents in the trial.

Now, reassessed at 2 years, the target lesion revascularization rates are 2.9%, 3.3%, and 3.8% for the Orsiro, Synergy, and Resolute stents, respectively. Although the numerical hierarchy is preserved, the differences are no longer significant.

Dr. von Birgelen

Other outcomes, including the primary outcome of target lesion failure, show the same numerical hierarchy but, again, without differences reaching significance. For target lesion failure, these rates are 8.5%, 8.8%, and 10.0%, respectively.

The difference in the rates of stent thrombosis at 3 years was even smaller with rates of less than 1% for all three stents. A catch-up phenomenon between years 2 and 3 of follow-up largely eliminated a numerical advantage seen earlier for the Orsiro stent.

The BIO-RESORT trial randomized 3,514 patients, of whom 70% had an acute coronary syndrome. Nearly one-third had an ST-elevated myocardial infarction. Dr. von Birgelen emphasized that this was "a very complex study population." For example, roughly 20% had severely calcified lesions. Follow-up data were available on 97% of the randomized patients at 3 years.

There are differences between these stents other than thickness and the durability of the polymer. In particular, Orsiro is coated with sirolimus, Synergy with everolimus, and Resolute with zotarolimus. While the metals of the frame also differ, the estimated time to resorption of the polymer is faster with the Synergy stent (4 months) than with the Orsiro stent (24 months).

Despite the loss of a difference in target vessel revascularization in the most recent follow-up, the potential for the differences in designs and materials to influence risk of late complications, including revascularization and thrombosis, persists.

"Follow-up beyond 3 years is of interest to definitely answer the question of whether one of these drug-eluting stents might improve outcome at a later stage," Dr. von Birgelen said at the meeting, sponsored by MedStar Heart & Vascular Institute. ❑

TRANSCATHETER AORTIC VALVE REPLACEMENT

Adjunctive devices for TAVR boost outcomes

WASHINGTON – One transcatheter device designed to prevent left ventricular outflow tract (LVOT) obstruction relevant to transcatheter mitral valve replacement (TMVR) and another designed to prevent coronary obstruction relevant to transcatheter aortic valve replacement (TAVR) performed well in feasibility studies, according to data presented in two separate late-breaking clinical trial sessions at the Cardiovascular Research Technologies 2019.

LVOT obstruction prevention

"The 30-day survival in subjects with an increased risk of LVOT obstruction was significantly better than that previously reported in registries," said Jaffar M. Khan, BM BCh, of the National Heart, Lung, and Blood Institute, who addressed results with the LAMPOON device prior to TMVR.

LAMPOON is an acronym for intentional Laceration of the Anterior Mitral valve leaflet to Prevent LVOT ObstructioN. Introduced percutaneously and guided to the valve with wires, the device was designed to tear existing mitral valve leaflets to prevent them from causing life-threatening LVOT obstruction. It is used immediately prior to TMVR in patients at risk for this complication.

In a feasibility study, delivery, deployment, and retrieval of the device was achieved in all 30 patients. On the basis of the primary endpoint of LVOT gradients of less than 50 mm Hg and no emergency surgery, the procedural success was 73%. The 30-day survival was 93%.

Citing data from registries, Dr. Khan said that the expected survival in TMVR patients with LVOT obstruction caused by a native mitral valve leaflet has been less than 40%. With few existing options to prevent this complication, none of which are reliable, LAMPOON is poised to permit patients who are poor candidates or are contraindicated for TMVR to undergo this treatment, Dr. Khan said at the meeting, sponsored by MedStar Heart & Vascular Institute.

"LAMPOON is feasible in all anatomies and calcium patterns," said Dr. Khan, who noted that gradients of less than 30 mm Hg were achieved in 29 of the 30 patients. Although Dr. Khan acknowledged that this study was small and uncontrolled, and he further cautioned that current strategies for predicting mitral valve leaflet LVOT obstruction are "imprecise," he believes larger studies of LAMPOON are warranted based on these results.

Coronary artery obstruction prevention

Dr. Khan also presented data on the BASILICA device from a second feasibility study. The device is employed immediately prior to TAVR in order to prevent large aortic valve leaflets – whether native or from an existing bioprosthetic valve – from producing coronary obstruction. BASILICA is an acronym for Bioprosthetic Aortic Scallop Intentional Laceration to prevent Iatrogenic Coronary Artery obstruction.

This device also is introduced percutaneously and uses radiofrequency ablation to split leaflets that are considered to pose a risk for coronary obstruction. Even though Dr. Khan acknowledged that there also is a lack of precision for predicting which TAVR candidates require an intervention to prevent coronary obstruction, he cited mortality rates exceeding 40% when this complication occurs.

In the feasibility study, 30 patients, of whom 80% were female, were enrolled. In half of the cases, the target for BASILICA was a native valve. The remainder were treated for risk of coronary obstruction posed by a bioprosthetic valve. Multiple comorbidities, including a high proportion with prior stroke, made those selected for enrollment poor candidates for surgery.

The BASILICA intervention was successful in 28 of the 30 participants and in 35 of the 37 leaflets treated. At 30 days, there was one death and one disabling stroke. The overall success rate of the procedure was 93%, according to Dr. Khan.

"One hundred percent of patients were discharged from the cath lab without coronary obstruction despite the high baseline risk," Dr. Khan said. Again, larger studies are needed to validate the safety and efficacy of this approach, but Dr. Khan believes the outcomes in this study warrant expanded clinical studies. ❑

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ACUTE CORONARY SYNDROMES

MI alert device shows predictive value

WASHINGTON – Although an implantable device for detecting myocardial infarction missed the primary composite outcome endpoint in a controlled trial, a extended analysis associated the device with a higher positive predictive value and a lower false-positive rate when compared with sham control, according to data presented at Cardiovascular Research Technologies 2019.

"Among high-risk patients, this system may be beneficial in the identification of both symptomatic and asymptomatic coronary events," reported C. Michael Gibson, MD, chief of clinical research in the cardiology division at Beth Israel Deaconess Hospital, Boston.

Dr. Gibson

The implantable device (AngelMed Guardian System), which received Food and Drug Administration approval last year, is designed to identify MI through detection of ST-segment elevations in the absence of an elevated heart rate. When the system detects an event during continuous monitoring, it sends a signal designed to tell the patient to seek medical care.

The multicenter ALERTS (AngelMed for Early Recognition and Treatment of STEMI) trial that tested this device was negative for primary composite endpoint of cardiac or unexplained death, new Q-wave MI, or presentation at the emergency department more than 2 hours after symptom onset (J Am Coll Cardiol. 2019 Feb 25. pii: S0735-1097[19]30237-2). In that trial, 907 patients were fitted with the device and then randomized to having the device switched on or left off.

At 7 days, a primary endpoint was reached by 3.8% of those in the device-on group versus 4.9% of those in the device-off group, a nonsignificant difference.

Nonetheless, there were promising results. For example, in patients who did have an occlusive event, those in the device-on group had better preserved left ventricular function, a result consistent with earlier presentation in the ED and earlier treatment. In fact, 85% of patients with an MI in the device-on group presented to a hospital within 2 hours, compared with just 5% of those in the device-off control group during the initial study period.

Because patients in both groups continue to wear the device, including those in the device-off group who had their devices activated after 6 months, there are now 3 more years of follow-up data.

"So we started the clock over with a new statistical analysis plan and new endpoints," Dr. Gibson explained at the meeting, sponsored by MedStar Heart & Vascular Institute.

There were numerous encouraging findings. One was that 42 silent MIs were detected over the extended follow-up. Another was that the annualized false-positive rate was lower in those with an activated device (0.164/year) when compared to the original device-off group (0.678/year; $P < .001$). Lastly, the positive predictive value of an alarm during the extended follow-up was higher than that of symptoms alone in the original device-off group (25.8% vs. 18.2%).

Dr. Gibson has financial relationships with many companies, including Angel Medical Systems. ❑

Readmissions high post STEMI with cardiogenic shock

WASHINGTON – Of patients with ST-elevation MI (STEMI) complicated by cardiogenic shock, 13% are readmitted within 30 days and remain in hospital for a mean 6 days, according to presentation at Cardiovascular Research Technologies 2019.

"About one in four of the readmissions was for heart failure," reported Karan Sud, MD, a cardiology resident at the Mount Sinai St. Luke's West Hospital, New York.

Despite gains in acute survival among STEMI patients in cardiogenic shock, little attention has been paid to the risk of readmissions, according to Dr. Sud. According to data collected from the National Readmissions Database for 2010-2014, these rates are high enough to deserve attention, he said.

In the years studied, there were 94,991 patients with STEMI and cardiogenic shock captured in the database, of whom 43,205 survived and were followed for readmission. Of the 5,503 readmissions within 30 days, 12% were considered unplanned; about 25% were for heart failure.

Dr. Sud

The predictors of readmission included female sex, age older than 75 years, average length of stay longer than 10 days, and more than three comorbidities, such as diabetes or chronic kidney disease, Dr. Sud said at the meeting, sponsored by MedStar Heart & Vascular Institute.

He reports no potential financial conflicts of interest. ❑

HYPERTENSION

Endovascular device sustains BP reductions

WASHINGTON – As a result of remarkably sustained antihypertensive effect, interest is intensifying in the potential for a pivotal trial to associate a novel endovascular device with unprecedented blood pressure control in patients with treatment-resistant hypertension, according to an update presented at Cardiovascular Research Technologies 2019.


Dr. Reilly

With up to 3 years of follow-up, "systolic blood pressures have remained persistently reduced by as much as 24 mm Hg," reported John P. Reilly, MD, an interventional cardiologist in Southampton, N.Y., who presented follow-up data for some of those enrolled in the first-in-human study of this device at the meeting, sponsored by MedStar Heart & Vascular Institute.

When the stentlike device is placed in the carotid artery, it alters its geometric shape, which increases pulsatile wall strain. The increase on wall strain alters an afferent signaling loop controlled by carotid baroreceptors that inhibits sympathetic outflow to lower BP.

In the CALM study, 47 patients were implanted with the device (MobiusHD, Vascular Dynamics): 30 in Europe and 17 in the United States. Initial findings in the European patients included a mean 21–mm Hg reduction in systolic BP and a 12–mm Hg reduction in diastolic BP measured by ambulatory monitoring at 6 months (Lancet 2017 Dec 16;390[10113]:2655-661).

The patients enrolled in the proof-of-principle CALM trial were required to have highly treatment-resistant hypertension, defined as a systolic BP of at least 160 mm Hg despite being on at least three antihypertensive medications. The average number of medications was 4.4, according to Dr. Reilly. The mean BP at entry was 165/98 mm Hg. Nearly 20% had previously undergone renal denervation.

In an update on CALM, Dr. Reilly reported that the large reductions in BP previously reported at 6 months have been sustained. Follow-up is about 3 years in most patients, and the reductions previously reported have persisted in responders. When a clinically significant response is defined as a 10–mm Hg or more reduction in office BP or 5–mm Hg or more reduction in ambulatory BP, 75% of patients enrolled are still responding, but the more important point is that there has been no substantial reduction in BP control over time in responders, Dr. Reilly said.

The persistent benefit over extended follow-up is driving excitement about the potential of this device. CALM-2, which is designed to be a pivotal trial to support regulatory approval of the device, began enrolling last fall.

"These are some of the greatest sustained reductions in ambulatory BP we have ever seen," said Vasilios Papademetriou, MD, PhD, a professor of medicine at Georgetown University, Washington. Impressed by undiminished BP control observed so far, he said the promise of this device as "very compelling."

Dr. Reilly holds stock in Johnson & Johnson. ❑

Alcohol renal denervation safe for BP reduction

WASHINGTON – Injection of dehydrated alcohol through the renal artery wall can be added to a growing list of renal denervation strategies that have been tied to sustained BP reductions.


Dr. Sievert

For the primary efficacy endpoint of change in systolic BP at 6 months, the mean reduction 6 months after denervation was 11 mm Hg as measured with 24-hour ambulatory BP monitoring (ABPM), Horst Sievert, MD, PhD, director of the Cardiovascular Center, Frankfurt, Germany, said at Cardiovascular Research Technologies 2019.

"Alcohol denervation was associated with efficient and safe lowering of systolic blood pressure," reported Dr. Sievert at the meeting, sponsored by MedStar Heart & Vascular Institute.

The 44 patients in the trial had treatment-resistant hypertension, with a mean systolic BP above 150 mm Hg while taking at least three antihypertensive medications.

The alcohol was delivered with a proprietary device called the Peregrine System infusion catheter (Ablative Solutions). It is equipped with microneedles that remain retracted until the catheter is navigated into position in the renal artery. When deployed, they inject alcohol into the perivascular space, which produces a neurolytic effect.

The technical success for delivery of the alcohol was achieved in 100% of the study group. There were no serious adverse events associated with treatment, Dr. Sievert said.

Following alcohol denervation, there was a mean 7-mm Hg reduction in diastolic pressure as measured with 24-hour ABPM.

Dr. Sievert did not include Ablative Solutions on a list of drug and device manufacturers with which he has financial relationships. ❑