

# Cath Lab Digest®

A Product, News and Clinical Update for the Cardiac Catheterization Laboratory Specialist

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## Cath Lab Spotlight



### Pikeville Medical Center Cardiac Cath Lab

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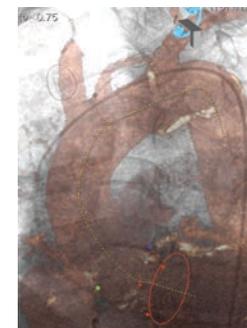
#### Tell us about your hospital and cath lab.

Pikeville Medical Center is located in Pikeville, Kentucky. Nestled in the beautiful mountains of Appalachia, Pikeville Medical Center services a large rural area, including bordering states of West Virginia and Virginia. We began with a mobile catheterization lab in 1992 as a part of cardiovascular service line. After years of dedicated hard work and determination to provide quality cardiovascular care to our patients, we have opened a brand new, state-of-the-art heart and vascular suite. It consists of three catheterization labs: one Azurion 12 cardiac suite (Philips) and two FlexMove Hybrid (Philips), and 20 cardiac and vascular suites with 7 pre-op bays. The cardiac cath lab employs 28 staff members, including 11 registered nurses (RNs), 11 special procedure technologists, one cath lab technologist, a director, assistant director, chest pain coordinator (an advanced practice registered nurse [APRN]), and materials management coordinator.

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## IMAGING

### Robotic-Supported Imaging With CT/Echo Fusion Overlay for Structural Heart Disease Treatment



Cath Lab Digest talks with Michael S. Kim, MD, FACC, FSCAI, Medical Director, Structural Heart and Valve Disease Program, Interventional Cardiology, Cardiovascular Institute of North Colorado, Banner Health, Greeley, Colorado.

#### Can you tell us about your facility and practice?

I currently work at the Banner Health Hospitals in northern Colorado. In April 2016, I joined the Cardiovascular Institute of North Colorado to lead the structural heart disease program. Initially, we started with a transcatheter aortic valve replacement (TAVR) program, and within the first eight months, went on to launch both the transcatheter mitral valve repair with MitraClip (Abbott Vascular) and left atrial appendage closure (LAAC) with Watchman (Boston Scientific) programs. Since then, we have created a very active

structural heart valve disease program performing the full array of structural heart and valve interventions, including not only TAVR, MitraClip, and Watchman implants, but also valvuloplasty, atrial septal defect (ASD)/patent foramen ovale (PFO) closures, and paravalvular leak closure. When I first arrived, we had a hybrid OR that was built in 2009. It had a single-plane imaging system in a sizable room, but the system was clearly reaching its "end of life" and the image quality was not quite up to par.

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## EXPERIENCE & ADVICE

### Getting a Balloon Through in Complex PCI: Crossing Made Easier



Cath Lab Digest talks with J. Aaron Grantham, MD, Saint Luke's Mid America Heart Institute, Kansas City, Missouri, about his work and experience with the Takeru PTCA balloon (Terumo Interventional Systems).

#### Can you describe your lab and your procedure mix?

I practice within the Saint Luke's Health System in Kansas City, predominantly at St. Luke's Mid America Heart Institute. I am an interventional cardiologist and spend the majority of my time in the cath lab. I do 250-300 percutaneous coronary intervention (PCI) procedures per year, and 60-70% of those

procedures are chronic total occlusions (CTOs) or complex high-risk indicated procedures (CHIP). It is important to emphasize that these procedures are being primarily done in patients who have angina and who have failed medical therapy. Even though these lesions are totally occluded, there is viability of the myocardium downstream that is usually maintained through collateral circulation.

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## Getting a Balloon Through in Complex PCI: Crossing Made Easier

Cath Lab Digest talks with J. Aaron Grantham, MD, Saint Luke's Mid America Heart Institute, Kansas City, Missouri, about his work and experience with the Takeru PTCA balloon (Terumo Interventional Systems).



J. Aaron Grantham, MD

The vast majority of these collaterals are sufficient to maintain viability, but not adequate enough to prevent ischemia if the patient has any increased need or myocardial oxygen demand. There have been tremendous advances in our ability to open these totally blocked arteries and a recent randomized trial demonstrated superior patient reported health status after PCI + optimal medical therapy (OMT) compared to OMT alone.<sup>1</sup> Now success rates are in the 90% range and complications rates are in the 5-7% range. Despite these advances, there remain a few technical challenges to efficient CTO PCI. A common challenge is the lesion that is crossed with a wire, but cannot be crossed with a microcatheter or balloon. This occurs in somewhere around 10% of cases.

### Once you get a wire across, what difficulties do you face?

We published a paper describing 13 common barriers to efficient chronic total occlusion angioplasty.<sup>2</sup> The most common barrier we encounter is having a wire across the lesion but the device won't go through. We are almost always wiring with a low-profile microcatheter. When the wire is across into the distal true luminal segment, the issue is to get that very stiff crossing wire

out, in order to avoid a distal wire perforation. So the first order of business is to take a microcatheter through the lesion and use the microcatheter to exchange the crossing wire for a typical soft-tipped, workhorse wire. Sometimes that isn't possible, so we created an algorithm to help operators decide what to do. The first thing we recommend is to take a 1.5 mm or smaller balloon, wedge it into the lesion, and inflate the balloon. The goal is to inch your way through the lesion by breaking into the cap of the lesion, and then moving the balloon on through. It is a strategy that requires a low-profile balloon with a great deal of pushability and good shaft strength. We like balloons that have mid balloon markers rather than markers at the tips, because the balloon marker is the largest crossing profile of a balloon, and with a mid marker balloon, the nose of the balloon can be wedged into the cap of the lesion.

### You have been using Takeru PTCA balloons (Terumo Interventional Systems) for complex PCI.

This balloon has the lowest crossing profile, including the mid balloon marker, with a profile of .60 mm, and it also has a reinforced shaft that extends closer to the balloon than any other balloon catheter. The 21 cm core wire runs from the proximal shaft through the rapid exchange portion, overlapping by 9 cm. The distance of the reinforced shaft from the balloon tip is one the reasons the Takeru is more pushable.

### Do you use the Takeru balloon in other scenarios as well?

Another place where I have been impressed by the use of the Takeru balloon is in bifurcation stenting. There are multiple different bifurcation techniques, but any time we use a two-stent strategy, we generally are trying to pass a balloon through the struts of one stent into a side branch. We have had some great successes with this balloon in side branch access in two-stent strategy techniques for bifurcation where others failed.

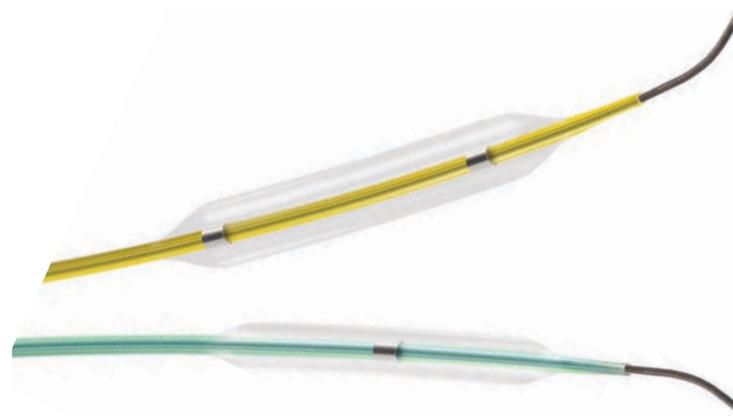


Figure 1. The Takeru PTCA balloon (Terumo).

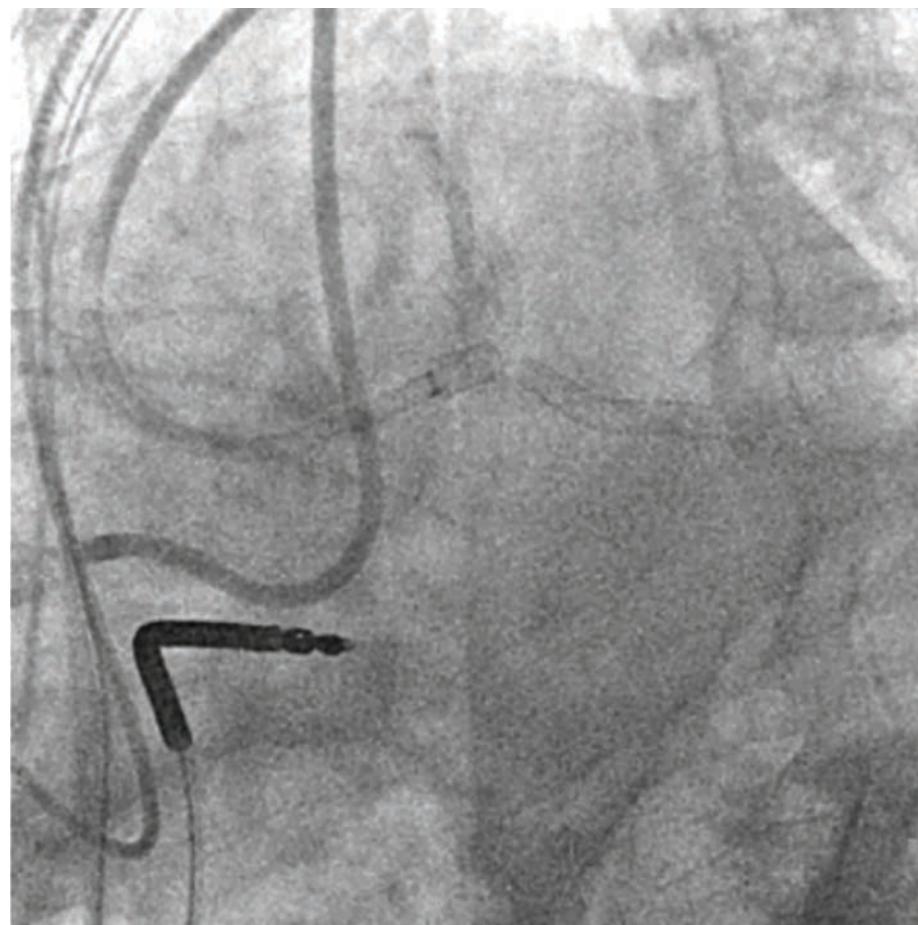


Figure 2. In-stent CTO of the proximal left anterior descending (LAD) coronary artery. This fluoroscopic image shows a "double barrel" LAD where the previous operator deployed a stent in the subintimal space, and another in the "true lumen" on sequential attempts to recanalize the LAD. Both stents are now occluded and CTO PCI was extremely difficult due to this aberrant anatomy and severe LAD vessel tortuosity.

### Bifurcation stenting can be accomplished using different techniques. What do you tend to use?

I use double kissing (DK) crush whenever possible, as it is one of the preferred strategies in terms of durability and long-term results. It is also easier in terms of crossing bifurcations but takes a couple of extra steps. The DK crush strategy was developed in order to avoid having to cross two layers of stent struts when using a typical mini crush, i.e., when attempting to access the side branch for the final kissing balloon inflation, you must first cross through the side and main branch stent struts with a balloon. Five to 10% of the time this is not possible, because no matter what balloon you use, it can't get through after a mini crush. A DK crush strategy

means you only have to get through one layer of stent into the side branch, so it will be more successful, but still requires low-profile balloons with very good pushability. The Takeru 1.5 mm has a mid-balloon marker, helpful because you can place the marker on the bifurcation and know that half your balloon is beyond the bifurcation and half is proximal to the bifurcation.

### Any advice for other physicians who may be interested in the Takeru balloon?

Try your workhorse balloon first, and if that doesn't work, try this balloon, and maybe go the other way around a few times. You can learn a lot from your own practice. It is not a randomized trial; we will never have one, but one thing

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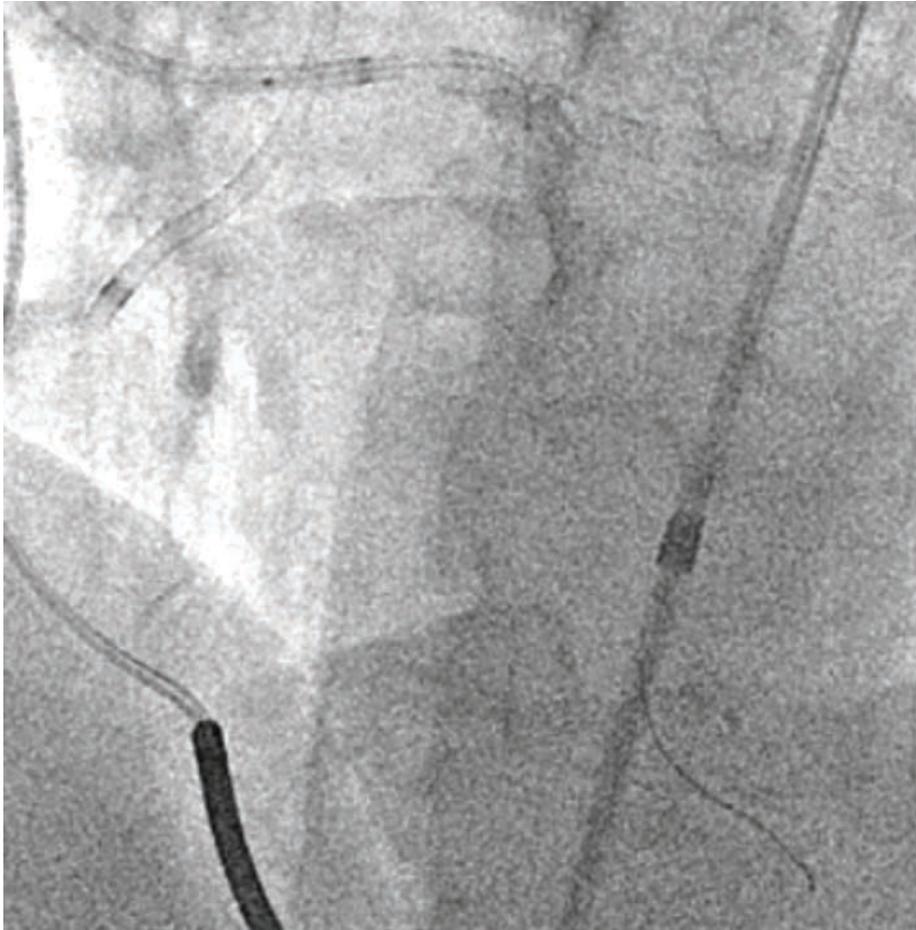
Disclosures: Dr. Grantham reports speaking fees and honoraria from Boston Scientific, Abbott Vascular, Asahi-Intecc, and Abiomed. Institutional research grants from Boston Scientific. Advisory Board membership for Boston Scientific and Abbott Vascular. Part-time employment and equity in Corindus Vascular Robotics as Coronary Chief Medical Officer.

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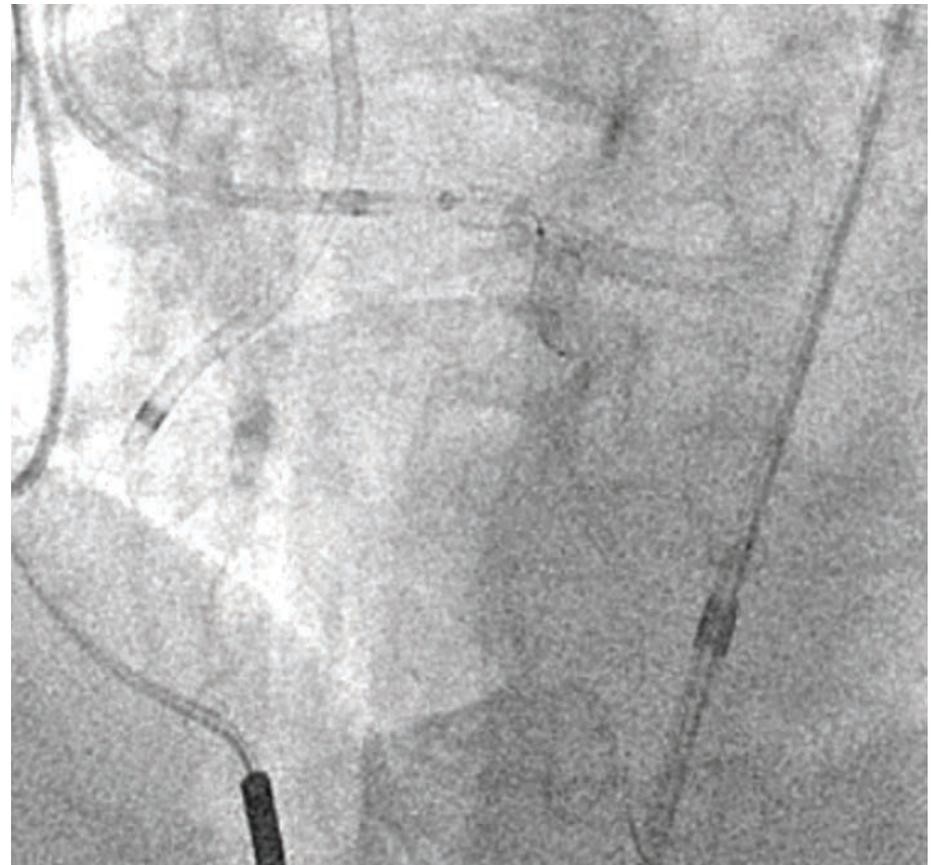
interventional cardiologists are good at trying new devices and fitting them into their practice. It is a good device. I encourage people to give it a chance. ■

### References

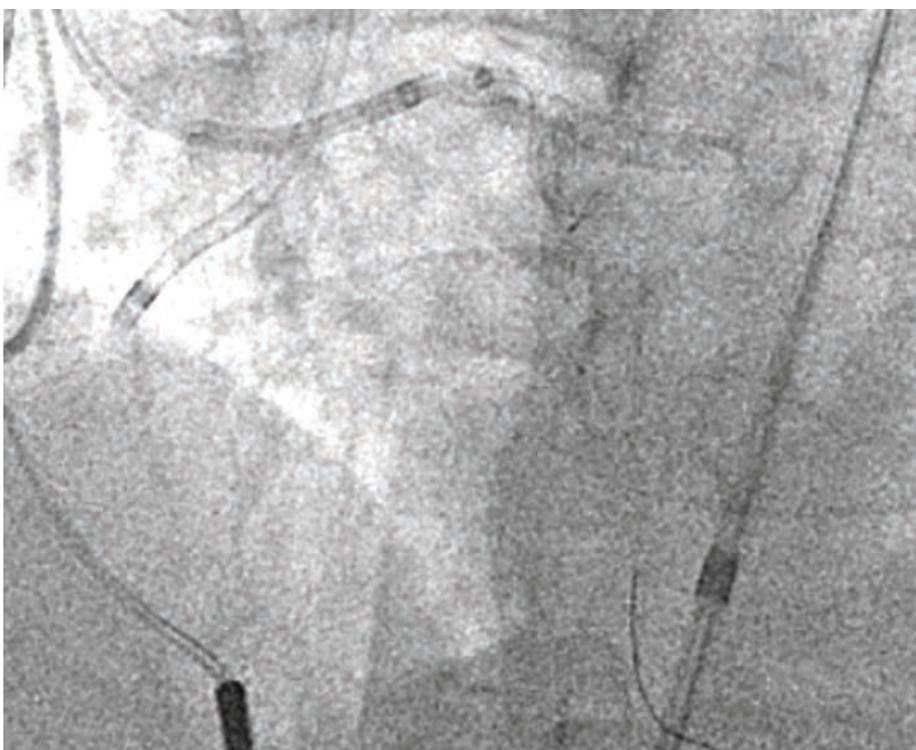
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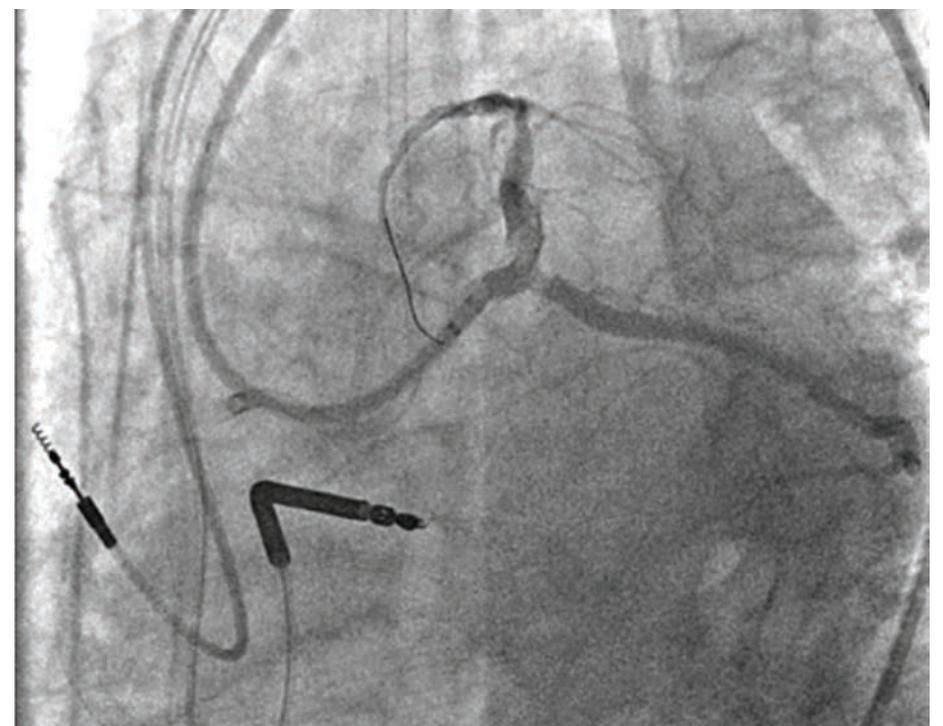
**Figure 3.** The lesion and old stents were crossed easily with a knuckled Gladius Mongo wire (Asahi-Intecc) using subintimal tracking and reentry (STAR) technique. Wires were placed in the diagonal branch and the LAD. Shown here is a 2.5 mm x 40 mm balloon that would not cross the previously double-stented proximal LAD.



**Figure 4.** Shown here is the Takeru 2.5 mm x 15 mm balloon that easily crossed the proximal LAD stents and was used for predilation.



**Figure 5.** The Takeru balloon passed easily into the mid LAD.



**Figure 6.** Final result after balloon angioplasty alone. Restenting will be deferred for six weeks, which is associated with better outcomes after STAR technique.