Cath Lab Digest®

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

HIGHLIGHTS

Cath Lab Spotlight

Miami Cardiac & Vascular Institute at Baptist Health South Florida

Barry T. Katzen, MD, Founder and Chief Medical Executive, Miami Cardiac & Vascular Institute; Dan Krauthamer, MD, Medical Director of Interventional Cardiology, Miami Cardiac & Vascular Institute – South Miami Hospital; Marcus St. John, MD, Medical Director of Cardiac Catheterization Lab, Miami Cardiac & Vascular Institute – Baptist Hospital; Jane Kiah, MSN, RN, Director of Invasive Services, Miami Cardiac & Vascular Institute – Baptist Hospital; Brenda John, MSN, MS-HSA, RN, Director of Nursing, Interventional Services & Heart Rhythm Center, Miami Cardiac & Vascular Institute – South Miami Hospital, Miami, Florida

Tell us about your cath lab. Is it part of a cardiovascular service line?

Dr. Katzen: One of the things that is unique about Miami Cardiac & Vascular Institute is that we are responsible for the entire service line of cardiac and vascular care at Baptist Health South Florida. Starting 30 years ago,

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CUTTING EDGE

Teamwork Drives Success: Alcohol Septal Ablation for the Treatment of Hypertrophic Cardiomyopathy at Westchester Medical Center

Cath Lab Digest talks with: Srihari S. Naidu, MD, Director, Hypertrophic Cardiomyopathy Program; Jason Jacobson, MD, Cardiac Electrophysiology; Kellee Lefco, RN, Assistant Nurse Manager, Cath Lab; Gabbie Fried, Vice President Nursing, Cardiovascular Services; Angelica Poniros, RCS, Clinical Manager of Non Invasive Cardiology; Tanya Dutta, MD, Director of Echocardiography; Robert Timmermans, MD, Interventional Cardiology and Cath Lab Director; Julio A. Panza, MD, FACC, FAHA, Chief of Cardiology; Westchester Medical Center, WMCHealth, Valhalla, New York.

How does alcohol septal ablation help hypertrophic cardiomyopathy (HCM) patients?

Alcohol septal ablation is able to modify one of the critical features of the symptomatic patient with HCM, namely obstruction to blood flow across the outflow tract from the abnormally thickened septum. By eliminating obstruction, symptoms of dizziness, dyspnea, and angina resolve over the ensuing 3-6 months, along with regression of hypertrophy. While both heart surgery (surgical myectomy) and alcohol septal ablation can do this, alcohol septal ablation offers a lower risk percutaneous option for older patients and those with comorbidities, as well as patients of all ages who have suitable anatomy.

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CLI PERSPECTIVES

Closure Devices for Groin and Tibial Access: The Value of Dual Access in CLI Therapy

J.A. Mustapha, MD, talks with Mark L. Lessne, MD, Vascular & Interventional Specialists of Charlotte Radiology; Adjunct Assistant Professor in Radiology and Radiological Science, Johns Hopkins University; Charlotte, North Carolina.

J.A. Mustapha, MD

Many of the trials evaluating closure devices with manual compression have shown no significant value or advantages to closure devices, except for minimizing the time to ambulate and possibly early discharge. The question remaining to be answered is whether the value of ultrasound-guided access followed by ultrasound-guided closure device placement could have the potential of being superior to manual compression, due to the fact that the operator can visualize device placement, deployment, and immediate evaluation of the result post deployment. Ultrasound-guided access with use of closure devices has been shown to be associated with a low complication rate.[1]

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Julio A. Panza, MD, FACC, FAHA, Chief of Cardiology
Westchester Medical Center, WMCHealth, Valhalla, New York

Figure 2. Srihari S. Naidu, MD, HCM Program Director.

How and why was an HCM program started at Westchester Medical Center?

Julio Panza, MD: HCM is a relatively uncommon disease; yet at the same time, it is the most frequent cardiac abnormality with a known genetic background. Consequently, no single general cardiologist sees a high enough volume of patients with the disease to be familiar with all forms of presentation. HCM has multiple manifestations, and it is difficult for one person to have the expertise necessary to treat all the different complications and presentations of HCM — hence the need to have a team approach to this disease.

HCMs many different manifestations touch on every aspect of cardiology, from noninvasive imaging, to interventional cardiology, to electrophysiology, to pediatric cardiology, and even psychology. Prior to starting our program, Westchester Medical Center had many of the components required to establish a hypertrophic cardiomyopathy team already in place, such as noninvasive imaging, electrophysiology, interventional cardiology, and so on. What we did not have was a leader with the expertise and recognition in hypertrophic cardiomyopathy like Dr. Naidu, and we didn't have the volume of patients that would expose the entire team to the wide variety of presentations that the disease may have. With the recruitment of Dr. Naidu, who has the expertise in alcohol ablation, and the development of expertise in the surgical approach to treating the disease, called septal myectomy, we now have the full complement of expertise required to diagnose and treat any form of this condition.

Dr. Naidu: Nationally, there is a big push to coalesce HCM care at defined centers of excellence, which requires a certain process nationally to achieve. Team approaches are evolving, but require at a minimum advanced imaging, defined HCM protocols, and the full armamentarium of management options.

Gabbie Fried, Vice President Nursing, Cardiovascular Services:

Figure 1. The Westchester Medical Center Cath Lab Team.

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Figure 3. Dr. Naidu performs an alcohol ablation after screw-in transvenous pacemaker placement, with echo guidance.

I oversee the operations and clinical care for nursing and technical services. There has been a great deal of training of all staff members to allow them to fit seamlessly into the HCM program. Dr. Naidu has personally trained and inserviced staff in many areas of the hospital, including the cath lab staff, echo technicians, Heart Institute staff where the patients enter the hospital and are prepared for the procedure, coronary care unit (CCU) staff where the patients are recovered, nurse practitioners who admit and discharge these patients, and the staff on the cardiology step-down unit, Cardiothoracic ICU and step-down units, and outpatient departments. Dr. Naidu has provided grand rounds both in cardiology and pediatrics. We encourage as many people to attend as possible, not only from cardiology, but in the world of medicine. We have tried to heighten awareness throughout the entire facility, as well as provide as much education as possible, so that everyone at our center is aware that HCM treatment requires a multidisciplinary approach.

Dr. Panza: Westchester Medical Center is a large tertiary and quaternary referral center about 20 miles north of Manhattan. It is affiliated with New York Medical College and has accredited fellowship training programs. We are also very active in continuing medical education (CME) and hold an annual cardiovascular symposium every fall. In terms of technology, Westchester has signed a multi-year, multi-million dollar contract with Philips, placing us at the forefront of technology for both invasive and non-invasive imaging and treatment.

Robert Timmermans, MD: I have been at Westchester for 6 years. Until now, we had no organized hypertrophic cardiomyopathy program; making this technology available to our patients here has been a huge change. Previously we had to send our patients to other centers, but now we are able to care for these patients here. I have a 90-year-old patient I just referred to Dr. Naidu, with combined HCM and aortic stenosis, and potentially this lady may be receiving both a septal ablation and a transcatheter aortic valve replacement (TAVR) procedure at our institution.

Dr. Naidu: TAVR has evolved into a relatively common procedure in older or intermediate risk patients. One of the challenges is that a significant portion of these patients will have either aortic stenosis combined with HCM or have the physiology that might make replacing the valve challenging. It is an example of how a team can work together to critically review the clinical aspects of a patient's care and make sure they get not only the right procedures, but the right sequence of procedures to enhance safety.

In order to perform alcohol septal ablation, have any changes been required from a lab or equipment perspective?

Dr. Naidu: We utilize relatively common angioplasty equipment: balloons, catheters, and wires. It is more about utilizing a team approach that gets everybody in the same spot at the same time for the same duration to make the procedure much safer and more effective with a common protocol and technique.

Dr. Panza: Although the procedure itself does not require ad hoc technology, we have recently embarked upon a major remodeling of all our cath labs. This is a $21-million-dollar project that will take a year and will bring the latest technology to our cath labs.

Dr. Naidu: We would like to be at the forefront of using this technique nationally. Together with Beaumont Hospital, we have cosponsored an alcohol septal ablation course for the past 4 years. One of the goals of the new remodel is to wire one of the cath labs so live cases can be displayed from Westchester Medical Center to audiences learning the technique, starting in about 2 years. One of the goals of this institution is to be a leader in alcohol septal ablation, not just in treating these patients and having a national market for this procedure, but also in teaching other hypertrophic cardiomyopathy centers how to perform this procedure with the proper team approach to minimize complications and improve efficacy.

How do patients reach Westchester Medical Center's HCM program?

Dr. Naidu: Patients come to us through an internal referral base or increasingly, from national outlets where they hear about our program. We have a dedicated HCM coordinator, Mallory O'Shea, LPN (as well as Nicole Goldman, who is our Long Island HCM Coordinator), and a dedicated email and phone number for the HCM program. Because of this, patients reach a clinical coordinator who can talk to them about our process and about the disease, and allow them to come into our system with a personal touch approach. It has opened up our hospital to a much larger national and international audience that wants that type of high-level, high-touch care that is individualized and expedited.

We typically will do an outpatient consultation and patients will get an echocardiogram with our specific HCM protocol on the same day as their visit. If they are coming from farther away, they will get both an echocardiogram and any other testing they need, such as cardiac MRI or stress testing — all on the same day. Then they see me for consultation in the afternoon, and all the information is packaged for them to take with them at the end of the day. At the end, we tell them what we think is necessary, and they may come back at other times to get the rest of their care. Some of these patients may need alcohol septal ablation or surgical myectomy. If alcohol septal ablation is necessary, they undergo a diagnostic catheterization and then, if certain clinical, hemodynamic and anatomic criteria are met, they return for their alcohol septal ablation.

Kellee Lefco, RN, Nurse Manager, Cath Lab: The Heart Institute is our outpatient throughput for the patients. They and their families are greeted and organized by the HCM coordinator. They are worked up with an ECG, labs, history and physicals, and consent. Patients are called the night before and told what to expect, and then they arrive at a certain time. When we have

Figure 4. The Hypertrophic Cardiomyopathy Team at Westchester Medical Center.

Figure 5. Dr. Julio A. Panza, Chief of Cardiology, and Dr. Srihari Naidu, HCM Program Director.

Figure 6. Dr. Srihari Naidu (top) and Dr. Anton Fuisz review images from an ablation patient.

alcohol septal ablation patients, I coordinate with our EP physician to be available for a transvenous pacer insertion. I coordinate with our echo team so we have echo at the bedside during the procedure, and then coordinate with the critical care team so there is a coronary care bed available for the patient post procedure. At some point, usually 3-4 days post procedure, we bring the patient back to the cath lab to have their transvenous pacer removed, or a permanent pacemaker implanted if needed.

Dr. Naidu: In the cath lab, the primary team includes the cath lab staff, the echocardiography team, which is Dr. Tanya Dutta and Angelica Poniros, RCS, Clinical Manager of Non Invasive Cardiology, the EP team, which is Dr. Jason Jacobson and Dr. Sei Iwai, Director of Electrophysiology, and myself and the interventional and general cardiology fellows.

How does an alcohol septal ablation procedure begin?

Jason Jacobson, MD: We start with the temporary pacemaker. There is a risk of heart block with alcohol septal ablation, both acutely and several days post procedure, so we will put in a temporary pacing wire prophylactically. In many places, the temporary wire is a standard passive wire put in through a femoral vein, which is often not very stable, and additionally patients become non-ambulatory, because they have a temporary pacing wire through the groin for a few days. You also don't want to leave it in too long, because a sheath in the groin is a risk for infection, along with the discomfort and immobility, which increases the risk for deep venous thrombosis (DVT).

In a new approach, we have been putting the wire in from the neck, via the right internal jugular vein. We put in an active fixation pacemaker lead like any other permanent pacemaker lead. We use a peel away sheath, so once the lead is in position, we peel away the sheath just like we would for a permanent pacemaker implant. The back end of that pacemaker wire is external, coming out of the neck. We hook it up to an externalized pacemaker generator and tape it down. This allows us to keep the pacemaker in for a number of additional days, increasing our ability to keep the patient safe for later block, should it occur, and it also allows patients to get up and move around without risk of cardiac perforation or other complication, because they don't have a sheath in the femoral vein. Generally, if things look good and the patient has one-to-one conduction after about 4 days, we will bring them back to the lab, we will retract the active fixation screw on the lead under fluoroscopic guidance, and then we pull it and hold pressure.

We have now done 20 alcohol septal ablations in the past year, with 2 more scheduled to round out the year, and certainly this puts us among the busiest in the nation, if not the busiest, for this procedure.

Dr. Naidu: Historically, as Dr. Jacobson mentioned, we were putting the pacemaker lead in through the leg, and that's what I did for the last 10-plus years for this procedure. I have noted at least two pericardial effusions and 1 tamponade, all of which were resolved and with no untoward long-term effects, but having a temporary lead from the leg definitely increases complications the longer it is in. As a result, we tended to remove it at 2 days, even though it would have been nice to keep it in longer to prevent some of the later heart block that occurs. The change here, which is new nationally for this procedure, is to put something in that is semi-permanent and safer, and allows us to monitor the patient longer for the main complication of the procedure, which is heart block. It is seamless; the patient is on one table instead of doing two separate procedures. The patient is draped from head to toe, Dr. Jacobson will come and do his pacemaker part, then right when he is finishing up, I come in, and along with the echo team, we will do our part, which is very much echo-guided. This process allows multiple people to treat the patient at the same time.

Can you talk about the use of echo guidance?

Dr. Naidu: In my previous experience, I was 90% fluoro/angiogram guided, and now I am moving toward 90% echo guided for this procedure — not just in determining where to put the alcohol, but also to look for complications. I am not even doing as many angiograms of the left anterior descending (LAD), because obviously the anterior wall will stop moving before there are any other problems. I am using echo a lot more and I am happy to do it this way, because our echo colleagues are really rigorous about being part of this team, and our sonographers are top-notch and able to toggle between multiple different views quickly in real-time.

Tanya Dutta, MD, Director of Echocardiography: The process starts as an outpatient when the patient undergoes an echo. All the HCM patients are put on to the same protocol, using Definity contrast to do a quantitative evaluation of the left ventricular (LV) parameters. Essentially, using the same protocol each time we image a patient, we know that we can reproduce these measurements and images in the cardiac cath lab. It allows for much better planning for the procedure Dr. Naidu performs in the cath lab.

Dr. Naidu: Under our protocol, echo is the first place you start with an HCM program. It has to be of a very high quality. In the beginning, we trained one technologist how to do the echo properly and it has evolved from there. But the idea is that you have to be very consistent. It is very important to know how high the obstruction gradients are, the location, the septal thickness, and any other problems of the mitral valve, all of which are extremely important in determining whether a patient gets alcohol septal ablation or surgical myectomy. Having an excellent quality echo in the beginning and throughout the course of the patient's stay becomes vital to doing the right procedure, on the right patient, and to get the best outcome.

Angelica Poniros, RCS, Clinical Manager of Non Invasive Cardiology: Dr. Dutta designed the unique protocol that Dr. Naidu uses for all of his patients. When we are in the cath lab, we set up our echo machine and I image the heart in three different imaging planes, making sure we have adequate windows so that Dr. Naidu can visualize the septum properly. We are constantly taking different gradients and different levels of the left ventricular outflow tract (LVOT) obstruction, just to make sure that we are reproducing the gradients that we had during the pre procedure echo. I am there to guide Dr. Naidu. As he is injecting the alcohol, we see the septum illuminate and become bright white echogenic. As the alcohol is injected, we make sure that there are no complications and echo stays

Figure 7. Dr. Tanya Dutta, Dr. Julio A. Panza, and Dr. Srihari Naidu consult about an HCM patient.

Figure 8. Additional members of the Westchester Medical Center Cath Lab Team.

in the room as long as needed, visualizing all areas of the heart.

Dr. Naidu: We are doing much more echo guidance because I have an active echo participant in the lab. I can keep the image on continuous Doppler and we can get continuous gradients that really help me throughout the procedure. If I am concerned about any other region, we can go to different views to make sure that everything is perfect. It makes the procedure much safer. It also makes me much more comfortable to have a team that is not there just because I have asked them to be there. They are there as a part of this procedure to make it as great as possible, and that is a real difference. There is a difference between a lab where the operator is asking for help, as opposed to a team where everybody is doing their part and knows what their role is. I think that is something that is very unique at Westchester Medical Center.

Kellee Lefco, RN: After we had initial inservices with Dr. Naidu, we set up a protocol for the things that he needed to do during the procedure and the process that the patient would undergo with the staff in the room. After the first couple procedures, we tweaked it, perfected it, and we continue to move it along. It shortens the time period for the patient as well, since we have perfected the protocol steps that we have in place. The staff has embraced the whole new process, and we are very excited to do this at Westchester, because we are constantly adding and doing new things here that the staff really appreciate and enjoy doing.

Dr. Naidu: We have been fortunate that it has actually been very busy. This is a relatively rare procedure, so you need hundreds and hundreds of patients with HCM to fuel alcohol septal ablation, because only 10-15% of patients require invasive therapies such as alcohol septal ablation or surgery. To do 10/year, you would need hundreds of new patients a year, or a large existing population, some of whom have progressed in their symptoms. We have a program that has 800-1000 patients, and we are growing at a clip of probably 100 new patients/year. We have now done 20 alcohol septal ablations in the past year, with 2 more scheduled to round out the year, and certainly this puts us among the busiest in the nation, if not the busiest, for this procedure.

Our standards are very discrete and consistent with national guidelines. This is a comprehensive approach, so we also have the surgical expertise. We had 3 surgical myectomies in June to launch our surgical program, and have done 5 more since then, for a total of 8 in our first year. We have a program where regardless of what the patient needs and gets, the outcome will be improved quality and quantity of life. And patients get the procedure that is best suited for their particular anatomy and disease state.

Dr. Jacobson: One of the unique things about Westchester is that it is a very high level cardiac center. We have an active heart transplant program and a very aggressive use of advanced hemodynamic therapies such as balloon pumps, and left ventricular assist devices including Impella and extracorporeal membrane oxygenation (ECMO). We have high-end EP and heart failure treatments.

Additionally, Dr. Naidu and I go back almost 20 years, and he also has many friends here from other phases in his training. It's one thing when you work in an institution when you have to get along and everybody has to back each other up, but it's different when your friend asks you to help out with something or help build something. This feeling is also reflected in how we care for our patients — these are people who get along and enjoy working together. That translates into patient care, which is not often as measurable as it is palpable to the patient.

Do you have advice for others who might be considering offering alcohol septal ablation?

Dr. Naidu: This is not a procedure where you can do 1 or 2 a year. National guidelines suggest you should do at least 8 procedures/year to remain credentialed and competent. We do at least 1-2/month, which is a huge volume, because these patients stay in the hospital for a week afterward. You are constantly taking care of these patients or you are ramping up for the next patient, so we are constantly thinking about it, and tweaking it to make it better and better. That goes for the Heart Institute, the cath lab, CCU care, and the residents and fellows. Everybody has their role so that things don't get missed. That is part of the reason we have been very successful so far, and for that we are also very proud.

How are you raising awareness?

Dr. Naidu: We have a large network at Westchester Medical Center, and we also have a satellite office in Long Island. In both territories, we are doing significant marketing, both on the website as well as through brochures that are going to go nationally to all cardiologists about how to access our program and the reasons to do so. We have done referral physician dinners, and have an HCM symposium planned for October 2017 as well. In addition, we have launched an HCM website at westchestermedicalcenter.com/HCM, with significant information about our program. Our HCM coordinator helps on the individual aspects after we see a patient, so that their referring physician gets a note back, and understands what the protocols are and where we are going with the patient. Typically, we tell the referring that we are going to be very involved and direct the care of any new consult for the next 6 months. We can micromanage the medications and then determine if they need procedures, and then get the patient back to the referring in a much better state. That is very important for this disease, because if you make the wrong medical or interventional decisions, it can make things much worse for the patient. It is important for us to use our team approach to give the patient the most expertise for the first 3-6 months. Then we hand back the patient to the referring and make it a long-term partnership at that point, where I see the patient maybe 1-2 times/year.

Dr. Dutta: Everyone who is active in the program really treats these patients like they are family. It is a concierge approach.

Dr. Naidu: I mentioned we have a phone number and email address specifically for HCM. We have done that for the TAVR program as well. It helps a great deal, because when patients call that number, they are only reaching somebody who is interested in and knowledgeable about HCM. That goes for weekends and weeknights as well. It is only our practice that answers that phone. These patients are often lost for many years before getting to an HCM program, and the last thing you want is for them to feel lost once they are in an HCM program. There is an estimate that only 15% of HCM patients are actually diagnosed. Regardless of how busy we are right now, there are 85% of patients who have yet to be diagnosed. Westchester has been around forever, but this is a new territory for HCM care, and so many patients are not receiving the comprehensive care that they could get from a larger program. Our community has truly opened up to getting these patients to us, so that we can give them the right care. It makes the patients happy and it makes the referring physicians happy. ■