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A discussion with a leader in interventional cardiology about the imaging modalities, research, and training that is necessary in treating aortic valve replacement patients.

Can you tell us about some of the imaging modalities that you use in your practice?

Multimodality imaging is critically important for interventionists who focus on structural heart disease and adult congenital heart disease interventions. It is not enough anymore for the interventional cardiologist to only be familiar with computed tomography (CT), magnetic resonance imaging, or echocardiographic imaging. Interventional cardiologists should be able to expertly interpret the imaging data every step of the way. Assessment of the anatomy and physiology in different disease states can only be accomplished with such expertise. During patient evaluation, these modalities should be used in a complimentary way.

In structural heart disease intervention, catheterization laboratories are effectively echocardiography laboratories as well. For example, in the implantation of a mitral clip, real-time transesophageal echocardiographic imaging is as important—if not more important—than fluoroscopic imaging. Alcohol septal ablation cannot be safely performed unless transthoracic echocardiography is incorporated into the procedure. Transesophageal echocardiography is an invaluable tool in the prompt diagnosis and management of catastrophic complications during transcatheter aortic valve implantation. Intracardiac echocardiography is a standard part of the procedure for transcatheter closure of intra-atrial communications. Furthermore, intravascular ultrasound is very helpful in optimizing the treatment of pulmonary vein stenosis after atrial fibrillation ablation, and real-time three-dimensional imaging is also very helpful in many procedures.

CT scans are increasingly incorporated in catheterization laboratories. Innovative cineangiographic techniques allow CT-like pictures in the catheterization laboratory. There are many more examples showing the value of multimodality imaging before and after interventional procedures. It is obvious that our aims cannot be accomplished if interventional cardiologists do not gain an expertise in an array of imaging modalities.

What is the current focus of your research energy?

Currently, most of my time and energy is devoted to researching the transcatheter treatment of valvular heart disease. I led one of the three teams that conducted the United States feasibility study for the Cribier-Edwards percutaneous heart valve (Edwards Lifesciences, Irvine, CA). I am also very much involved in the PARTNER trial; I am a member of the Executive Committee of the trial.

I am also involved in the study of various transcatheter mitral valve therapies. Our practice has a very active program studying percutaneous paravalvular leak closure. We have an animal laboratory in which we conduct studies for aortic and mitral valve therapeutics and test new innovative ideas, and furthermore, we participate in collaborative studies with biomedical engineers in developing new ways of transcatheter valvular treatments.

What further exploration do you think is needed in regard to adult congenital heart defects?

One of the biggest hurdles in adult congenital heart defects is the limited tools that we have to treat these patients. The devices that allow us to plug holes, close defects, and open holes are not as versatile as we would like. This limitation is in part due to the smaller number of patients.

Could you tell us about your work in training new cardiologists?

At the Cleveland Clinic, we have an active, 2-year training program in interventional cardiology. The second year is devoted to peripheral vascular intervention and structural heart disease intervention. During this year, fellows spend time not only in the catheterization laboratory with structural heart disease patients, but they also attend to these patients and follow them in the outpatient clinic. We put equal emphasis on the technical aspects and cognitive aspects of this subspecialty. Any training program that does not involve the trainees with patient evaluation and post-

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procedure care will fall short in training young cardiologists for this expanding subspecialty.

When you work with cardiologists abroad, is there a difference in your educational approach, the information/practices you teach, or with the doctors themselves?

When I interact with international physicians, I try to take into account their needs and resources. I try to keep in mind that there is more than one way of achieving excellent patient care. I am open to learning from the experiences of my interventional colleagues. This is perhaps more important in the international setting.

What do you see as being the current state of catheter-based valvular repair and/or replacement? Which areas still need improvement?

The current state of catheter-based valvular repair and/or replacement can be described as being in its infancy. We are just scratching the surface of what is possible, and we still have a lot of unresolved issues. For example, in transcatheter aortic valve implantation, we still operate with fairly high mortality and morbidity rates. In most centers, patients still receive general anesthesia and surgical cutdown and repair.

Furthermore, paravalvular aortic regurgitation is still an issue that needs to be dealt with. There are two prostheses that can be implanted via catheter that are not retrievable after implantation. The mitral clip is a big step forward, but it still leaves a large proportion of the mitral regurgitation patients out of reach based on the selection criteria of the trials. Devices that work through the coronary sinus are still in the relatively early stages of clinical development.

Are there any upcoming meetings/symposia that you are involved in?

I am the Co-Chair of the ACC and i2 Summit that will be held in New Orleans April 3 through 5, 2011. I am also on the Program Committee for TCT 2010, and I am involved in a number of national and international meetings on transcatheter valvular therapeutics. ■

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