

## EDITORIAL COMMENT

# A Picture (and a Video) Is Worth a...\*



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*“To see and to take pleasure in seeing, to see  
and be amazed, to see and be instructed;  
Thus to see, and to be shown, is now the will  
and the new expectancy of mankind.”*

—Henry R. Luce,

Introduction to *Life Magazine*, 1936 (1)

This quote may sound familiar, as it was used by Jagat Narula—the Editor-in-Chief of *iJACC*—in the first Editor’s Page of the then new journal, printed in Volume 1, Issue 1, in 2008 (2). Dr. Jagat Narula was highlighting his vision for *iJACC*—a vision that has clearly been fulfilled. Cardiovascular imaging today is amazing and does instruct us. So, why would I reiterate this quote? There are 2 reasons. First, on the cover of *iJACC* Volume 1, Number 1, were images of a 3-dimensional transesophageal echocardiogram (TEE) of a woman over 60 years of age with inoperable, severe aortic stenosis who underwent a transcatheter aortic valve replacement (TAVR) with a self-expanding Edwards valve (Edwards Lifesciences, Irvine, California). These images were from the first TAVR procedure done by my colleagues at Emory University Hospital in the Division of Cardiology: Drs. Vasilis Babaliaros and Peter Block, under the tutelage of Dr. John Webb, the proctor. I was fortunate enough, along with my colleague, Dr. Stamatios Lerakis, as well as our experienced sonographer, Maria Pernetz, to be performing the TEE. This was one of the most dramatic things I have ever witnessed in my years in cardiovascular medicine. To see a stenotic trileaflet aortic valve be replaced, within a matter of seconds, by a well-functioning trileaflet tissue prosthetic valve was not only dramatic and amazing, but also instructive.

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But, most importantly, this procedure allowed this woman, who had inoperable aortic stenosis due to radiation-induced sternal necrosis, to quickly resume a much-improved life.

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The second reason that I repeat the opening quotation is because in the current issue of *iJACC*, there are 2 outstanding papers by Hahn et al. (3,4) dealing specifically with echocardiographic imaging (primarily TEE) of procedural complications that occur during transaortic valve replacement. These 2 papers give us a compendium of outstanding and well-illustrated images and videos that describe the various complications that can occur with both the balloon-expandable Edwards valve and the self-expanding CoreValve (Medtronic, Inc., Minneapolis, Minnesota). Although none of us might “take pleasure” in seeing the complications, these papers clearly provide instructions for all of us who might now or in the future be called upon to aid with echocardiographic evaluation of the TAVR procedure. What is most important is that the authors not only include extremely experienced echocardiographers, but also interventionalists and surgeons who represent the best of the field. Hence, their contribution is both extremely important and very instructive.

Although surgical aortic valve replacement continues to be the gold standard for the treatment of severe aortic valvular stenosis, TAVR has become a game changer in cardiovascular medicine. As with any new technology and procedure, experience becomes the best teacher. Advances have come not only with catheter and valve design, but also with interventional and operative experience. These advances have clearly led to a decrease in procedural complications and have improved the quality of the outcome. But, complications do and will occur; hence, the importance of these papers.

The first paper by Hahn et al. (3) deals with a total of 527 patients in the PARTNER I (Placement of Aortic Transcatheter Valves) trial. The authors provide a list of adverse events (Table 1 in Hahn et al. [3]), and then

provide outstanding images and video recordings of these complications. Although it was not the goal of the paper, the authors do provide a summary of recommendations for the echocardiographic imager to hopefully aid them in learning how to not only quickly recognize such complications, but also prevent or minimize such complications in the future. Part II by Hahn et al. (4) provides similar descriptions of 262 patients who received the self-expanding valve.

Taken together, the outstanding illustrations and text provided by these very experienced echocardiographers should hopefully improve the outcome of TAVR procedures that are performed by newer or less experienced “heart valve teams.” There is no doubt that with newer devices and operative techniques coming into the field, some of the complications will be minimized. But, the knowledge provided by these papers is extremely important, because as the TAVR procedure continues to mature and be utilized on patients who are at intermediate risk for surgical aortic valve replacement, and potentially for those at lower risk for surgical procedures, the safe deployment of these valves is of the utmost importance.

So, what are the take-home messages from these papers?

1. Experience and dedication counts. Both of these papers include dedicated interventional echocardiographers with extensive experience who not only have expertise in performing and analyzing echocardiographic images, but also are key members of the heart valve team and the “interventional” team. Due to their dedication and professionalism, they have become critical, respected members in the hybrid operating room or in the catheterization laboratory. The interventionalists and surgeons performing the procedures value their input and have come to rely upon their echocardiographer colleagues to help them provide the best outcome. Katzenbach and Smith, in their textbook, *The Wisdom of Teams: Creating a High Performance Organization* (5), make the conclusion that a team is a small number of people with complementary skills who are committed to a common purpose, set of performance goals, and approach for which they hold themselves mutually accountable. Thus, 1 of the important take-away messages from this paper is that the “interventional” echocardiographer must not only become dedicated to the high performance of his or her skills during the TAVR procedure, but must also become an integral member of the team. This is not, nor will it ever be, a procedure in which the “echocardiographer of the day” or those less experienced

could rotate through a TAVR procedure. The procedure requires echocardiographers with great expertise and excellent communication skills, so that they can help the interventionalist and surgeon provide the highest quality care to the patients.

2. As the TAVR experience has progressed throughout the world, many sites have begun utilizing and embracing the “minimalist approach,” which allows the procedure to be performed in the cardiac catheterization laboratory without general anesthesia or TEE. Babaliaros et al. (6) have emphasized that this method has equivalent effectiveness along with minimal morbidity and mortality versus the more standard approach that is performed in a hybrid operating room utilizing general anesthesia and TEE. The impetus for this new approach has been that more rapid mobilization of the patients can occur post-TAVR, which minimizes hospital stay as well as decreases the costs associated with the TAVR procedure. It should be pointed out that many utilizing the minimalist approach are individuals with extensive experience with traditional methods of implanting the TAVRs. However, as a word of caution, we do not yet have a large compendium of data that clearly compares the safety and intraprocedural outcomes with this approach—one that is very important as newer operators enter the field. Neither do we have a large amount of data indicating that transthoracic echocardiography can instantaneously provide the same safety margin as does TEE, especially in detecting major complications that might occur. Although many interventionalists and surgeons have come to rely on fluoroscopic images more than echocardiographic images, as well as hemodynamics, this author wonders about the potential safety of TAVRs being performed by less experienced operators or in lower-risk individuals without the safety net of outstanding and excellent echocardiographic imaging, especially transthoracic echocardiography. The major complications of TAVR (cardiac perforation, valve embolization, aortic or myocardial rupture, or significant perivalvular-valvular aortic insufficiency) all need to be recognized immediately. Although hemodynamics and fluoroscopy can be used, clearly an experienced echocardiographer—one who is an integral member of the interventional team—can provide instantaneous recognition of these complications and, more importantly, might be able to help prevent these complications from occurring. Whether transthoracic echocardiography performed in a catheterization laboratory can provide the same safety net as a well-performed TEE has

yet to be proven. But, as previously noted, if the minimalist approach becomes the procedure of choice, then whoever is providing echocardiographic guidance in the laboratory must be a well-experienced individual who is a critical, respected member of the team. Again, this is not the place for the least experienced echocardiographer, physician, or sonographer.

So, back to the title. There is an adage, “a picture is worth a thousand words.” In the case of these 2 papers, the pictures and the words not only provide

tremendous instruction for us, but most importantly, they also provide us with a method to improve the quality of our TAVR procedures and, hence, improve the quality of care we provide for our patients—which, after all, is Job One in medicine.

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