Improving Outcomes in Aortic Stenosis Through Patient-Centric Care

Announcer:

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Here's your host, Dr. Matthew Sorrentino.

Dr. Sorrentino:

This is Heart Matters on ReachMD. I'm Dr. Matthew Sorrentino, and joining me to share strategies for optimizing the treatment of aortic valve stenosis is Dr. Brian Lindman. Dr. Lindman is the Medical Director of the Structural Heart and Valve Center and the Associate Professor of Medicine at the Vanderbilt University Medical Center in Nashville, Tennessee. Dr. Lindman, welcome to the program.

Dr. Lindman:

Hey, thanks for having me. I look forward to the discussion.

Dr. Sorrentino:

Let's start with some background, Dr. Lindman. Can you tell us about the prevalence of aortic valve stenosis in the different patients that we see in our clinics every day?

Dr. Lindman:

There's this course of strong influence of age on the incidence and the prevalence of aortic stenosis, so generally speaking, across all epidemiologic studies that have been done, the prevalence of aortic stenosis in those above 65 years of age is approximately five to 10 percent. But that prevalence does increase substantially as you go from the 60s to 70s to 80s, so it's up towards 10 or 15 percent when you get into the 80s.

Dr. Sorrentino:

Are there any major risk factors we should think about that is increasing the prevalence of aortic stenosis in our older patients?

Dr. Lindman:

Yeah, in that regard, there have been some studies done that have shown risk factors that are associated with the incidence of aortic stenosis. There's been some done in genetic causes, but in terms of lifestyle factors, things that have been associated include hypertension—high blood pressure is probably the strongest link—but also diabetes, hyperlipidemia, smoking; those are other risk factors that have been associated with the incidence of aortic stenosis.

Dr. Sorrentino:

I know that patients can have aortic stenosis that stands many, many years. Are there any current recommendations on the optimal timing of treatment and valve replacement?

Dr. Lindman:

Yeah, so you alluded to the fact that patients can have aortic stenosis for years, and indeed, going from a more mild blockage of the valve to severe. So from a valve area of approximately two to one, on average, can take about 10 years because the rate of progression is about 0.1 centimeters squared per year. However, there is large patient-to-patient variability, and so some patients may progress over that time period in five years. In some, it may take 20 years. And the factors underlying a progression rate are not entirely clear at this point. But in terms of a valve replacement, and I would point out that there are no medicines currently approved or shown to decrease the progression rate of aortic stenosis, so valve replacement is the treatment utilized for patients with aortic stenosis. And the current ACC/AHA guidelines for valvular heart disease outlines stages of aortic stenosis, and I think that's helpful to level-set for the audience

today.

Dr. Sorrentino:

In the past, we've always talked about waiting for symptoms to develop or waiting for LV dysfunction before we start intervening. This new classification system sorts that out into different categories, but I guess the question I want to ask—is there evidence that intervening earlier than we have in the past give benefit to our patients? Should we be thinking of those early-stage C patients and intervening earlier than we would have in years ago?

Dr. Lindman:

Class C includes patients who are asymptomatic, but they have high gradient, severe aortic stenosis—that is a valve area under one with a mean gradient above 40 and/or a peak velocity above four. Class C1, the subgroup there, has an LV ejection fraction that's considered preserved, which would be above 50 percent in the guidelines, whereas Class C2, they remain asymptomatic, they have high gradient severe AS, but their EF is below 50. Class D then, is looking at patients who are symptomatic with their severe aortic stenosis, and there are three subgroups there. D1 is high gradient severe AS, that I just alluded to; D2 is those with low flow, low gradient, low EF—that is below 50 percent aortic stenosis, so they have a valve area under one but gradients that are below a mean gradient of 40 or peak velocity of four. And when you do a dobutamine echo, that yields a peak velocity greater than four, if it's truly severe, with a valve area that remains under one. Increasingly, as an alternative to dobutamine echo, CT is sometimes being done to measure aortic valve calcium score to determine severe valve disease, and there's separate cutoffs for men and women. D3 then is those with low flow, low gradient, preserved EF aortic stenosis; so-called "paradoxical low flow, low gradient AS." And again, dobutamine echo and/or CT can be used to clarify whether it's pseudo-severe versus truly severe.

And based on that staging, the recommendations that the guidelines lay out for timing of AVR are as follows: Class 1, or the strongest level of recommendation, is for those who are stage C2—that is high gradient, severe AS without symptoms but with an ejection fraction that's below 50 percent; stage D1— high gradient, severe AS with symptoms; stage D2—low flow, low gradient, low EF, AS with symptoms; and finally, stage D3—low flow that is a stroke volume index below 35 with a low gradient and a preserved ejection fraction with other testing showing that the valve is severely diseased. And then there are some class 2A indications where if you have stage C1 AS—so high gradient severe AS with a preserved EF—and you're at low surgical risk, if you have one of these risk factors, that could be considered something that would be reasonable to recommend valve replacement. That is a decreased exercise tolerance or a drop in blood pressure with a treadmill test or a very high gradient AS that is a peak velocity above five or a BNP greater than three times normal or a progression rate of AS where the peak velocity increases by more than 0.3 meters per second per year. So those are the staging and the recommendations that are currently in the guidelines.

Dr. Sorrentino:

For those just tuning in, you're listening to Heart Matters on ReachMD. I'm Dr. Matthew Sorrentino, and I'm speaking with Dr. Brian Lindman about aortic valve stenosis.

Dr. Lindman, you just mentioned that we're thinking of earlier interventions in patients with aortic stenosis. Can you give us some guidelines on how we should recognize this disease and diagnose this disease at those earlier stages?

Dr. Lindman:

Our guidelines to this point on timing of AVR have largely focused on the severity of valve obstruction. However, there are multiple lines of evidence pointing to the fact that how the myocardium, or the left ventricle, responds to pressure overload from AS has a significant impact on patients; how they do over time. And so as the valve progressively narrows, the heart remodels; fibrosis begins to set in, ventricular hypertrophy sets in, and systolic and diastolic dysfunction begin to occur. And this process is highly variable, so some patients may have a valve area of 1.1, and their heart is perfectly healthy, responding fine, whereas another patient may have marked hypertrophy, fibrosis, and dysfunction at the same valve area. So while in many cases—also that maladaptive remodeling and dysfunction reverses after the valve is replaced and the heart is unloaded—in a number of patients, reversal or recovery of LV structure and function is incomplete or it doesn't occur at all, yielding a residual risk from heart failure, such as earlier death, rehospitalization, or persistent symptoms even after a technically successful procedure. So this has generated a hypothesis that intervening earlier, before remodeling and dysfunction are irreversible, maybe better, at least in some patients. So accordingly, there are now several randomized strategy trials going on right now, testing the timing of AVR in patients—in one case when it is severe, but symptoms are absent. An example of that is the EARLY TAVR trial, or EASY-AS, or EVOLVED. And then in other trials, even when the AS is still moderate but other high-risk features are present, and so an example of that is the PROGRESS trial. So these randomized trials are going to be incredibly helpful in providing evidence on this issue of when is the optimal timing of valve replacement.

Dr. Sorrentino:

Since we are beginning to look to diagnose patients at an earlier stage, can you discuss some factors that may be contributing to gaps

or delays in care or delays in diagnosis of severe aortic stenosis?

Dr. Lindman:
Yeah, there are several potential factors. Perhaps, I'll share three here. One that I see quite commonly is an echocardiographer in reviewing echocardiography reports, is that when there's a discordance between the valve area and gradients, specifically, meaning the valve area is less than one but the mean gradient is less than 40, and the peak velocity is less than four. So some criteria suggest severe, namely the valve area, other criteria suggest more moderate, and those discordant cases are often read as "moderate" or "moderate to severe." And since we only treat, according to the guidelines that we reviewed earlier, patients with severe AS, these patients then get passively watched rather than taking an additional step to see if they may be a stage D2 or stage D3 patient and have low gradients, but actually have severe AS. And so an appropriate next step would be to do a valve calcium score, perhaps, or dobutamine echo or a treadmill test to clarify some of these things, and those things are often not done. Number two, ambiguity regarding symptoms or minimization of symptoms that are present. So you're dealing here with patients in their 60s, 70s, 80s, 90s who oftentimes have backed off on some of their activities, may be mostly sedentary, so ascertainment of symptoms can oftentimes be tricky. And in the patient's mind, they may just attribute something to "I'm getting older," and not even mention it. So that's another problem in terms of classifying whether symptoms are present. And then finally, perhaps for now, would be to say a misunderstanding regarding procedural risks. Clinicians who are less familiar with the procedural risks of transcatheter aortic valve replacement may still be operating out of a surgical mindset in which they would routinely view an 85-year-old, for example, the 85-year-old in front of them as too high risk for such an invasive procedure. And while that may be true for some patients, for surgical valve replacement, the risk, for most patients undergoing a transcatheter aortic valve replacement, of mortality or a life-threatening complication, such as a stroke, is generally less than three percent. There are some exceptions, but generally, less than three percent in almost all cases. And a very high risk of functional status decline, repeat rehospitalizations, and a fairly rapid death if those with symptomatic severe aortic stenosis are not treated with aortic valve replacement. So the risks of not doing something are actually a lot higher than the risk of doing something. So these are some of the factors that contribute to this gap or delay in care.

Dr. Sorrentino:
So, Dr. Lindman, given the delays in care that we've been talking about, how can we ensure that patients are treated in a timely manner?

Dr. Lindman:
Yeah, this is a difficult question. I think our tendency is to think that, 'Well, we just need to educate people.' And while education plays a role, it's not enough. Many of these guidelines have not changed in two decades, and so it's not purely an education problem. We need system-level changes if we're to address a problem like this.

And so to date, all quality initiatives in the treatment of aortic stenosis have been focused on the period of time from the procedure and afterward; that's the TVT registry and the STS registry. Over the last few years though, the American Heart Association has partnered with Edwards Lifesciences to launch the AHA Target Aortic Stenosis Initiative. And the goal of this initiative is to shine a light on all the processes and operations happening upstream of the aortic valve replacement procedure to ensure timely diagnosis, timely referral, timely evaluation, and timely treatment of those with severe aortic stenosis who warrant and desire aortic valve replacement.

Dr. Sorrentino:
And, Dr. Lindman, as we end our discussion today, are there any final thoughts you would like to share with our audience?

Dr. Lindman:
Yeah, I think that many people think that with the introduction and widespread adoption of transcatheter aortic valve replacement, that there isn't much left to do in the field of aortic stenosis. But that really couldn't be further from the truth. There are still multiple questions to answer and processes to improve in order to optimize outcomes for all patients with aortic stenosis.

Dr. Sorrentino:
And with those thoughts in mind and these key takeaways that we've been talking about, I want to thank my guest, Dr. Brian Lindman, for joining me to discuss the management strategies for aortic valve stenosis. Dr. Lindman, it was great having you on the program today.

Dr. Lindman:
Thanks for having me. It was a pleasure discussing these important issues.

Announcer:
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