Deborah Heart and Lung Center

HURLEY IN THE MORNING › PODCAST TRANSCRIPT

Understanding Heart Valve Disease

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FEATURED PHYSICIAN

Muhammad Raza, MD

Interventional Cardiologist

Harry Hurley

It is my pleasure to welcome back — we've done really important work together in the past on air — Dr. Mohammad Raza, interventional cardiologist. He's board certified in cardiovascular disease and interventional cardiology. Dr. Raza completed a residency in internal medicine at Drexel University College of Medicine in Philadelphia, Pennsylvania, and also completed a fellowship in cardiology and interventional cardiology there. Dr. Raza has extensive experience in interventional cardiology, with a primary focus on structural heart disease interventions. His special interests include interventional cardiology, valvular heart disease, adult congenital heart disease, complex coronary interventions, and peripheral vascular disease. Dr. Raza has authored numerous articles in peer-reviewed journals and is an accomplished speaker on all of these topics and more.

Dr. Raza also holds several leadership titles at Deborah Heart and Lung Center: Acting Division Director, Director of the Structural Heart Program, and Director of the Interventional Cardiology Fellowship Program. In terms of professional accomplishments, there are many — I'll give you a few: Fellow of the American College of Cardiology, and Fellow of the Society for Cardiovascular Angiography and Interventions. He's double board certified in cardiovascular disease and interventional cardiology. Our topic this half-hour with Dr. Raza on Deborah Heart and Lung Center Presents is Understanding Heart Valve Disease. Dr. Raza, welcome back, sir.

Dr. Muhammad Raza

Good morning, Harry, to you and all the people who have tuned in. I'm really excited to talk about this topic — valvular heart disease, and how to recognize and treat it early on.

Harry Hurley

Thank you for all the great work that you do. I like to call it all the lives that you're saving. What are the four valves in the heart, and what is their function?

Dr. Muhammad Raza

To understand the function of heart valves, it's important to understand the function of the heart in general. The heart is a pump — its job is to pump blood into our organs — and it has four chambers, two top and two bottom. On the right side, between the right upper and lower chambers of the heart, there's a valve called the tricuspid valve, which is also commonly called "the forgotten valve" — we can dig deeper into that later. Between the right bottom chamber of the heart and the lungs, there's a valve called the pulmonic valve, which lets blood out of the right side of the heart into the lungs. As blood flows through the lungs, it picks up oxygen and flows back into the left side of the heart. Between the left upper chamber and the left lower chamber, there's a valve called the mitral valve. The left bottom chamber then pumps blood into the body, and it passes through an exit valve called the aortic valve. The left bottom chamber is also the main pumping chamber, and when we refer to heart function in general, we're usually referring to the function of this chamber.

For the heart to function properly, the valves have to be working properly, because their job is to make sure blood flows in one direction — from the right side of the heart through the lungs, then through the left side of the heart, which pumps the oxygenated blood out into the body. That's how circulation works, that's how the heart functions, and that's how the valves help blood flow in one direction.

Harry Hurley

Such a good explanation, and it makes me want to ask a follow-up question. We have four valves, and you did a great job breaking it down — if you have a problem with one valve, do you also have a problem with the other three? Are they independent of one another, or do they work in coordination? Does a problem with one eventually mean a problem with all four, or can one valve have a problem while the other three are fine?

Dr. Muhammad Raza

It's possible for one valve to not be functioning properly, and early on, that could be an isolated problem. However, if left untreated, it could affect the other valves' function as well, because there is some level of coordination between the different valves. It also depends on the mechanism of failure, which we can dig into in a minute. So valves could have an isolated problem, that problem could secondarily affect other valves, or in some cases more than one valve could be affected by a disease or condition. It could be a combination — anywhere from isolated to multi-valvular heart disease.

Harry Hurley

Our guest this half-hour is the distinguished interventional cardiologist Dr. Raza on Deborah Heart and Lung Center Presents. Today's topic is Understanding Heart Valve Disease, and we're off to a really good start with the content Dr. Raza is sharing. Dr. Raza, what are heart valve diseases?

Dr. Muhammad Raza

A valve can go bad by not opening properly, which is called stenosis, where the valve restricts blood flow. Or it can be a leaky valve, where the valve isn't closing properly, so blood regurgitates or leaks backward — we call that valvular regurgitation. So either it's narrowed and not opening properly, or it's not shutting properly, which leads to leakiness.

Harry Hurley

I've always wanted to ask you this, and you just reminded me. If you have a leaky valve and it's backing up, where does that go? Does the body just miraculously handle it and absorb it? That doesn't sound like a very good thing. What happens with that?

Dr. Muhammad Raza

You're spot on. The body does try to compensate early on, but as valvular heart disease gets worse or more severe, that backing up of blood ultimately starts to cause blood to back up in the lungs or the legs, causing shortness of breath — because the job of the lungs is to oxygenate blood, and if there's too much fluid or blood backing into the lungs, oxygen can't get into the blood, and people feel short of breath. The same way, if it's backing up into the right side, it can cause edema, or swelling, in the legs. So early on, the heart is trying to compensate, and that's why it's important to recognize this early and intervene as needed, instead of waiting until the last minute, when the heart that's been compensating is no longer able to.

Harry Hurley

If that's leaking for any length of time — let alone a prolonged period — can that cause damage to the lungs?

Dr. Muhammad Raza

Yes, it can cause damage to the heart as well, because the valves are responsible for making sure blood flows in one direction. If a valve is regurgitating or leaking backward, that creates what we call volume overload — the blood that was supposed to go forward gets pumped backward and comes back, so more blood comes forward from the lungs, in addition to the blood that's already leaked backward. Overall, there's more stress on the heart because of this malfunction, and ultimately the heart will start to dilate, meaning it becomes larger. The same backing-up effect into the lungs causes higher pressures there, which can cause lung damage and heart damage — damage that can become unrepairable if it's left alone too long. So there are serious consequences to not recognizing and fixing this early on.

Harry Hurley

So important. The topic this half-hour is Understanding Heart Valve Disease, as Deborah Heart and Lung Center Presents Dr. Raza on this important subject. We'll take a break right now, and then we'll go uninterrupted through the end of today's program. When we

come back, Dr. Raza will address the symptoms of heart valve disease — and there could be listeners right now dealing with something they're not even fully aware of. Pay close attention, because this could be exactly the reason to schedule an appointment at Deborah Heart and Lung Center. You can do that by phone at 609-621-2080, or on the web at demanddeborah.org. Back with Dr. Raza in just a little bit — don't go away.

Welcome back, 24 minutes past the hour — it always flies by with Dr. Raza. If you're just joining us, Dr. Raza is an interventional cardiologist at Deborah Heart and Lung Center. He holds several leadership titles there as well: Division Director, Director of the Structural Heart Program, and Director of the Interventional Cardiology Fellowship Program — uniquely qualified to talk about today's topic, Understanding Heart Valve Disease. Dr. Raza, we teased this right before the break — what are the symptoms of heart valve disease?

Dr. Muhammad Raza

The common symptoms of valvular heart disease include shortness of breath. Let's say a patient is otherwise walking around, climbing a flight of steps, or walking their dog without any symptoms, and they start to feel short-winded. In some conditions, patients can have chest discomfort, dizziness, lightheadedness, or lower extremity edema. Very often, because valvular heart disease tends to happen as you get older, patients ignore their symptoms and assume it's just part of getting old. When I ask a patient, "Do you have any symptoms?" very often the answer is, "Well, what do you expect from an 80-year-old?" That's very common, because valvular heart disease tends to happen in elderly patients and develops very slowly, so patients gradually shrink their lifestyles and attribute both the symptoms and the lifestyle changes to aging. Essentially, they're not presenting early enough.

A fun story: I had an 82-year-old woman who came in with valvular heart disease, referred by one of her primary care physicians. When I asked her, "Do you have any symptoms?" her answer was, "Well, I have no symptoms, but when I'm vacuuming, I feel my vacuum cleaner is too old, because I can't push it, and I get tired and short of breath." Sure enough, we investigated further, and she had critical valve disease. We ended up replacing the valve through a catheter technique — we can talk later about that — and she was discharged home the next morning. She called me back a few days later, saying she was feeling great, had no more symptoms, and that the vacuum cleaner was fine.

Harry Hurley

The vacuum cleaner is fine — she thought it was the vacuum cleaner. That's an amazing story. Here's a scary question: can you have heart valve disease without experiencing any symptoms?

Dr. Muhammad Raza

Yes, it can be very indolent. Patients can have valvular heart disease for years, maybe decades, without feeling any symptoms. Part of the reason is that the valve isn't bad enough yet — it's not stenotic or regurgitating enough — and the body, or the heart, is

compensating, as we discussed earlier. That compensatory phase can last a long time, where the heart works harder to compensate for the malfunctioning valve, and patients may not feel symptoms for quite a while. But the most important thing is, if there are any symptoms, not to ignore them and attribute them to allergies, weather changes, getting older, or "I didn't eat right" — those are the common ways people end up ignoring symptoms. Can valvular heart disease be asymptomatic in its early phase? Yes, it's possible — but it still needs to be recognized. Sometimes we just keep an eye on a condition like that to see when a patient develops symptoms or when we need to intervene. That's a much better way to manage the valve than just waiting for symptoms to appear.

Harry Hurley

We're visiting with Dr. Raza, interventional cardiologist at Deborah Heart and Lung Center. To schedule an appointment, call 609-621-2080 or visit demanddeborah.org. Let me follow up on what you mentioned about diagnosing it. How is valve disease diagnosed?

Dr. Muhammad Raza

Commonly, a doctor listens to a patient's heart and listens for any extra or abnormal heart sounds, called murmurs. That's a quick test in the office or clinic that can quickly indicate that valve function is abnormal. Further investigation involves an echocardiogram, an ultrasound of the heart, which can evaluate the structure and function of the valve along with the heart in general. That echocardiogram is very diagnostic and confirmatory for valvular heart disease. Sometimes we step forward to further investigation, which may involve a transesophageal echocardiogram — an endoscopy-like procedure where an ultrasound probe is passed down the throat under general anesthesia. The patient doesn't feel any discomfort, and we can get closer to the heart to look at the valves more closely and carefully. In some situations, we end up doing a CT scan, an MRI, or even a heart catheterization for further investigation. But the vast majority of the time, an echocardiogram is sufficient to diagnose valvular heart disease.

Harry Hurley

If it's not diagnosed and not treated, what does heart valve disease lead to?

Dr. Muhammad Raza

First, the patient will continue to have symptoms — shortness of breath, fatigue, tiredness, edema, dizziness, lightheadedness — and those will persist and get worse if untreated. There will also be consequences for the heart, because, as we discussed, the heart is compensating for a malfunctioning valve, and that compensatory phase can only last so long. After that, the heart will start to fail, which means the patient will develop congestive heart failure, requiring hospitalization and potentially leading to death. It can also have secondary effects on the lungs and the liver.

One way to understand how the heart compensates is to think about aortic valve disease — the exit valve on the left side of the heart, which lets blood out into the body. When the

aortic valve becomes narrowed, or stenotic, the left bottom chamber of the heart gets thicker — a compensatory mechanism to force blood through the narrowed valve, similar to how muscles get bigger and stronger when we lift weights at the gym. But if this process continues, the left bottom chamber starts to dilate, becomes weaker, and is no longer able to pump effectively through the abnormal valve. That's an advanced situation, and it can again cause congestive heart failure requiring urgent intervention. So it's so important to recognize this early, so the damage to the heart is reversible and we can fix the valve disease before it affects other organs.

Harry Hurley

Dr. Raza, here's an opportunity for you to share three specific examples. What options are available to treat mitral valve disease, aortic valve disease, and tricuspid valve disease?

Dr. Muhammad Raza

Let's take mitral valve disease first. It's the valve on the left side, between the top and bottom chambers of the heart. The mitral valve fails predominantly by leaking — mitral valve regurgitation — leaking backward into the left upper chamber of the heart and then into the lungs. A leaky mitral valve can be repaired through a transcatheter procedure called transcatheter edge-to-edge repair. In that procedure, we place a tiny catheter in the femoral vein in the groin and pass it all the way into the left upper chamber of the heart. Through that catheter, we pass a clip. Guided live by transesophageal echocardiography, we identify exactly where the leak is happening, then deploy the clip right at that spot to stop the leak. The procedure itself takes approximately 45 minutes to an hour, sometimes shorter, and the patient can go home the next morning. That's transcatheter mitral valve edge-to-edge repair. The other option is to place a new valve in the mitral position — called TMVR — which is also FDA-approved at this point and can also be done through a catheter.

The aortic valve is replaced through a catheter technique called TAVR, transcatheter aortic valve replacement. We place a tiny catheter through the femoral artery and pass it all the way through the aortic valve, guided by a wire. Over that wire, we deliver a valve that's been crimped down small enough to pass through the catheter, position it inside the old aortic valve, and expand it before the delivery system is removed. That takes about 30 to 45 minutes at most, it's extremely minimally invasive, and the patient is discharged home the next morning. TAVR is a very mature procedure — we've been doing it for almost 15 years now.

As for the tricuspid valve, which I mentioned earlier is also called "the forgotten valve" — the reason is that historically, focus was on the mitral and aortic valves, both surgically and through transcatheter techniques, and the tricuspid valve was overlooked for a number of reasons. One is that the symptoms associated with tricuspid valve disease tend to be fairly mild. Patients with tricuspid valve regurgitation often present with fatigue, tiredness, or edema, and traditionally they were treated with a water pill, or Lasix, to relieve the edema, without addressing the underlying leaky valve. Unfortunately, these patients were just kept on medical management without fixing the underlying condition, which wasn't a good outcome.

Fortunately, thanks to catheter-based technologies and recent advances, we're now able to repair and replace the tricuspid valve in a very similar way. We bring the patient in under general anesthesia, place a tiny catheter in the right femoral vein, and use that to access the tricuspid valve. As with the mitral valve, we identify which part of the valve is leaking and deploy a clip right there to stop or minimize the leak. We can also do tricuspid valve replacement, passing a wire through a catheter and delivering a new valve over that wire before the catheter and wire are removed. Again, that takes about 45 minutes to an hour at most, and the patient is discharged home the next morning. It's very exciting for patients that all these conditions can now be managed with minimally invasive transcatheter procedures — every valve can be addressed, whether by repair or replacement.

Harry Hurley

I know you've already given us a couple of minutes of overtime — let me ask one last follow-up, because I think it's something folks would want to know. We haven't talked about recovery. Is there a recovery period, and what should people expect afterward?

Dr. Muhammad Raza

We recommend patients avoid any heavy lifting for a few days, depending on which valve was repaired — that can last somewhere between one and two weeks. But we do recommend staying active. We want them walking around, not being a couch potato, but being as active as possible while avoiding heavy lifting. After about two weeks, there are no restrictions. That's important to keep in mind, because traditionally, with open-heart surgery, the recovery period was weeks to months, and given the "use it or lose it" nature of muscle, that meant a longer rehabilitation process. With these transcatheter procedures, the patient goes home the next morning and can resume usual activities, so there's very little downtime.

Harry Hurley

That's Dr. Raza's presentation this morning on understanding heart valve disease. To make an appointment, call 609-621-2080 or visit demanddeborah.org. Dr. Raza, always nice to be with you — welcome back, and I look forward to next time.

Dr. Muhammad Raza

Thanks, Harry, as always.

Harry Hurley

My pleasure, sir. Thank you. Thanks for all that you do.